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REPORTS INCLUDED

OFFSETS IN DEFENSE TRADE, A Study Conducted under Section 309 of the Defense Production Act of 1950, As Amended Prepared By U.S. Department of Commerce Bureau of Export Administration Office of Strategic Industries and Economic Security Strategic Analysis Division, May 1996

OFFSETS IN DEFENSE TRADE, A Study Conducted under Section 309 of the Defense Production Act of 1950, As Amended Prepared By U.S. Department of Commerce Bureau of Export Administration Office of Strategic Industries and Economic Security Strategic Analysis Division August, 1997

OFFSETS IN DEFENSE TRADE, Third Annual Study Conducted under Section 309 of the Defense Production Act of 1950, As Amended Prepared By U.S. Department of Commerce Bureau of Industry and Security Office of Strategic Industries and Economic Security Strategic Analysis Division, August 1998

UNITED STATES DEPARTMENT OF COMMERCE
Bureau of Industry and Security
Washington, D.C. 20230
May 22, 2012

Subject: Freedom Of Information Act (FOIA) Request Ref: BIS 12-058

This is in response to your May 14, 2012 FOIA request to the Department of Commerce's Bureau of Industry and Security (BIS). Your request was for the following items:

1. A complete electronic copy of the First Report to Congress on Offsets in Defense Trade (May 1996).

2. A complete electronic copy of the Second Report for Congress on Offsets in Defense Trade (August 1997).

3. A complete electronic copy of the Third Report to Congress on Offsets in Defense Trade (August 1998).

The information you requested has been assembled in the enclosed documents and released to you in full.

If you have questions regarding this request, please contact Mark Crace at (202) 482-8093 or via e-mail at mark.crace@bis.doc.gov.

Sincerely,

Gay Shrum

Gay Shrum
Chief Financial Officer and
Director of Administration

Enclosure

OFFSETS IN DEFENSE TRADE

A Study Conducted under Section 309 of the Defense Production Act of 1950, As Amended

Prepared By
U.S. Department of Commerce
Bureau of Export Administration
Office of Strategic Industries and Economic Security
Strategic Analysis Division

May 1996

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OFFSETS IN DEFENSE TRADE

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OFFSETS IN DEFENSE TRADE

1. Introduction

This is the first report on offsets in defense trade prepared under the direction of the Department of Commerce pursuant to the 1992 amendments to Section 309 of the Defense Production Act of 1950. The Bureau of Export Administration (BXA) within the Department of Commerce has been delegated authority to compile these required annual reports. To assist in preparation of the reports, BXA was given authority under these amendments to collect data from U.S. firms involved in offset agreements in connection with sales of weapon systems or defense-related items to foreign countries or foreign firms. The data collected for this report covers offset transactions and agreements entered into during the time period 1993-1994. In brief, the data indicates that over the 2-year period offset percentages of sales are slightly lower than in previous years. In addition, the data shows the use of indirect offsets has increased relative to direct offsets in defense trade. Additional data is needed to substantiate these trends. Overall, offsets continue to be an important and necessary factor in international transactions involving the sale of defense articles.

1.1 Legislation

On April 17, 1984, Congress enacted amendments to the Defense Production Act of 1950, which included the addition of Section 309. This new section required the President, no later than 18 months after the date of enactment, and annually thereafter, to submit to the Committee on Banking, Finance, and Urban Affairs of the House of Representatives and the Committee on Banking, Housing, and Urban Affairs of the Senate a report on the impact of offsets on the defense preparedness, industrial competitiveness, employment, and the trade of the United States. Additional minor modifications to Section 309 have been made in subsequent years by the Congress.

When Section 309 was first enacted, the Office of Management and Budget (OMB) was appointed as the interagency coordinator in the preparation of the annual offsets report for the Congress. These reports were to be prepared in consultation with the Departments of Commerce, Defense, and Labor, and the Office of the United States Trade Representative.

This interagency report continued as structured, with minor adjustments, until 1992, when Section 309 underwent major modifications. The interagency coordination role was transferred from OMB to the Secretary of Commerce. In addition, the Secretary was given authority to develop and administer regulations to collect from industry the offset data required for the report. This responsibility was later delegated to the Department's Bureau of Export Administration (BXA). A change was also made in Section 309, adding a sales reporting threshold previously cited in the National Defense Authorization Act for fiscal year 1991. The offset agreement threshold was reduced from $50 million to $5 million for U.S. firms entering into foreign defense sales contracts subject to offset agreements. On a per-transaction level, firms must report all offset transactions for which they receive offset credits of $250,000 or more. A copy of Section 309 can be found in Appendix A.

Federal Register Notices

On April 26, 1994, BXA published in the *Federal Register* (59 FR 21678) a proposed rule (see Appendix B) on reporting of offsets in military exports. The notice was designed to elicit comments, suggestions, information, or advice relative to the proposed regulation. Twenty responses were received commenting on the proposed rule. The two major topics raised by industry concerned the requirements to submit semi-annual reports and to report each individual transaction undertaken to fulfill an offset commitment. The rule was amended to address these concerns. In addition, some companies commented that they would not report the actual and stated value of offset agreements because the data was proprietary. This issue was resolved, after industry was given assurances that the data would be held confidential, pursuant to the offset regulation and the Defense Production Act, and would not be reported in a way that would reveal individual company operations.

The proposed rule was then finalized and published in the *Federal Register* (Vol. 59, No. 231) (see Appendix C). It became effective on December 2, 1994. It was determined that the rule would primarily affect large defense contractors that engage in offset agreements with foreign governments. The rule was not expected to pose an excessive burden on firms engaged in offset transactions. It was known that these firms must prepare periodic accounts of progress toward fulfillment of offset obligations for foreign entities that are party to the offset agreement. Moreover, the information to be collected was less than that required by these foreign parties. With regard to new offset agreements entered into, the information requested was readily available and was estimated to take a minimal amount of time to assemble by industry participants.

To avoid double counting, firms provided data only for those offset transactions which they were directly responsible for reporting to the foreign customer (i.e., prime contractors reported for their subcontractors if the subcontractors were not a direct party to the offset agreement). Reports were delivered to BXA's Office of Strategic Industries and Economic Security. The first industry reports were submitted to BXA before March 15, 1995, and covered offset transactions valued at $250,000 or more completed during the calendar year 1993, as well as information regarding new offset agreements entered into during the year. After this initial submission, companies provided an additional filing by June 15, 1995, covering calendar year 1994. All subsequent annual filings will be due on June 15 of each year. For the time period 1993-1994, BXA collected data from 26 firms having offset obligations resulting from military-related export sales.

Reporting on Offset Transactions

The final *Federal Register* notice outlined the information to be submitted. Offset Transaction Reports were to include an itemized list of offset transactions completed during the report period, with the following data elements:

> Name of Country - Country of entity purchasing the weapon system, defense item or service subject to offset.
>
> Name or Description of Weapon System, Defense Item, or Service Subject to offset.
>
> Name of Fulfilling Entity - Entity fulfilling offset transaction (including first tier subcontractors).
>
> Name of Offset Receiving Entity - Entity receiving benefits from offset transaction.
>
> Offset Credit Value - Dollar value credits claimed by fulfilling entity including any intangible factors/multipliers.
>
> Actual Offset Value - Dollar value of the offset transaction without multipliers/intangible factors.
>
> Description of Offset Product/Service - Short description of the type of offset (e.g., co-production, technology transfer, subcontract activity, training, purchase, cash payment, etc.)

Broad Industry Category - Broad classification of the industry in which the offset transaction was fulfilled (e.g., aerospace, electronics, chemicals, industrial machinery, textiles, etc.)

Direct or Indirect Offset - Specify whether the offset transaction was a direct or indirect offset.

Name of Country in which Offset was Fulfilled - United States, purchasing country, or third country.

Offset transactions of the same type (same fulfilling entity, receiving entity, and offset product/service) completed during the same reporting period could be combined.

Reporting on Offset Agreements Entered Into

In addition to the itemized list of offset transactions completed during the specified time period, U.S. firms were asked to provide information regarding new offset agreements entered into during the year, including the following elements:

Name of Country - Entity Purchasing the Weapon System, Defense Item, or Service Subject to Offset.

Name or Description of Weapon System, Defense Item, or Service Subject to Offset.

Names/Titles of Signatories to the Offset Agreement

Value of Export Sale Subject to Offset (approximate)

Total Value of the Offset Agreement

Term of Offset Agreement (months)

Description of Performance Measures (e.g.,"best efforts", liquidated damages)

To date, industry has cooperated fully with BXA in the reporting of offsets information.

1.2 Background

Offsets are industrial compensation practices mandated by many foreign governments when purchasing defense articles. Definitions of offsets used by industry and government are sometimes inconsistent. Most parties, however, use the defense trade term offsets, which was developed by a U.S. Government interagency group in 1986. In defense trade, offsets include mandatory co-production, licensed production, subcontractor production, technology transfer, countertrade, and foreign investment. Offsets may be direct, indirect, or a combination of both. Direct offsets refer to compensation, such as co-production or subcontracting, "directly" related to the system being exported. Indirect offsets apply to compensation unrelated to the exported item, such as foreign investment or countertrade.

Countries require offsets for a variety of reasons: to ease (or "offset") the burden of large defense purchases on their economy; to increase or preserve domestic employment; to obtain desired technology; and to promote targeted industrial sectors. In extensive discussions with BXA, U.S. prime contractors reported that defense exporters often must fulfill these demands or risk losing a valuable sale. Moreover, industry informed BXA that, in most cases, defense exporters cannot even submit a bid proposal without including an offset package.

Since World War II, U.S. defense industries have been major players in the international arms market. Co-production/licensed production in defense trade were initially encouraged by the U.S. Government to help rebuild the war-ravaged economies and industrial bases of Western Europe and Japan. Co-production/licensed production of U.S. weapon systems in foreign countries began in the late 1950s and early 1960s. The NATO countries and Japan were the first to receive co-production/licensed production agreements from the United States.

During the Cold War, it was in the best interests of the U.S. to ensure that allied countries were strong militarily as well as economically. Offsets have served important foreign policy and national security objectives of the U.S., such as increasing the industrial capabilities of allied countries, standardizing military equipment, and modernizing allied forces. The use of offsets is now commonplace. Today, virtually all of the defense trading partners of the United States impose some type of offset requirement, and at times the stated value of the offset exceeds that of the sales contract.

The type of offsets that buyer countries are demanding is changing as many countries face decreasing security threats and excess capacity in their arms industries. Foreign governments

typically use direct offsets involving co-production to justify expensive arms purchases, claiming that the purchase will boost local employment and national security by helping to maintain domestic defense industries.

Increased competition for a declining number of international arms contracts should continue to foster offset agreements. U.S. technology and weapon systems, notably aerospace, are generally the best available on the world market, and U.S. defense firms generally have competitive advantages over foreign concerns in the range of direct and indirect offsets they can provide.

While offsets are used as a "marketing tool" by arms exporters, buying governments now have greater market leverage and expanded choice. The industry reported to BXA that buyer countries often appear ready to absorb higher costs associated with many offsets, particularly co-production agreements, apparently to gain access to technology and increase local employment. In cases where buyers recognize that the costs outweigh the benefits of a particular direct offset, industry noted that the buyers are more than likely to emphasize indirect offsets rather than stop demanding them altogether. As a result, many buyer countries now prefer indirect offsets as a means to promote economic development, to diversify arms industries, or to improve their balance of trade. The BXA offset data supports this trend.

The newer offset customers, especially in the Middle East, are seeking to diversify their economies rather than build or maintain a defense industry. Pacific Rim countries such as Singapore, Taiwan, and South Korea are seeking offset deals that include increased technology transfer, particularly in aircraft design, to become self-sufficient in military production and to overcome industrial weaknesses that are hindering their efforts to compete in the world aerospace market with U.S. and European manufacturers. Japan's policy of co-producing defense items has a similar objective.

Here are two examples of the offset demands by foreign trading partners that U.S. industry must attempt to fulfill in order to export high value U.S. defense products:

- In selling an aerospace platform to Switzerland, the U.S. prime contractor is making efforts to market millions of dollars worth of Swiss-made metal- forming and metal-cutting machine tools to "offset" the platform's purchase price.

- A similar deal with Spain required the U.S. prime contractor to locally source aircraft parts and related software (direct offsets), as well as take back wine, chemicals, stone

products, canned fruits and vegetables, and motor vehicle parts as compensation (indirect offsets).

In both examples, the offsetting products may have either displaced U.S. defense subcontractors manufacturing the same component or increased competition for U.S. industry sectors not related to fighter aircraft.

The *Offsets in Military Exports* reports prepared by OMB from 1985 to 1990 highlighted a growing trend in offset demands by buying countries around the world for direct offsets (related to the weapon sale) and indirect offsets (not related to the sale). Indirect offset demands have expanded dramatically beyond defense/aerospace to affect other industries such as automobiles, semiconductors, software, and telecommunications. The 1993-1994 data gathered by BXA highlights a continuation of this trend of expanded indirect offsets. Of the actual offset transactions that took place in 1993 and 1994:

- 1/3 of the offsets were direct (related to the weapon systems sold)
- 2/3 were indirect (not related to the weapon systems sold)
- 3/4 of total offsets (direct and indirect) involved the purchase or subcontracting of goods and services or the transfer of technology.

In the 1993-94 data, as shown in section 2 of this report, there were 127 different Standard Industrial Classification (SIC) codes affected by direct and indirect offsets.

1.3 Offsets Definitions

Listed below are offset definitions as outlined in the *Federal Register* (Vol. 59, No. 231) dated December 2, 1994, prepared by BXA; and *Offsets in Military Exports*, OMB, dated December 1988.

Offsets: Industrial compensation practices required as a condition of purchase in either government-to-government or commercial sales of defense articles and/or defense services as defined by the Arms Export Control Act and the International Traffic in Arms Regulations.

Military Export Sales: Exports that are either Foreign Military Sales (FMS) or commercial (direct) sales of defense articles and/or defense services as defined by the Arms Export Control Act and International Traffic in Arms Regulations.

Direct Offsets: Contractual arrangements that involve defense articles and services referenced in the sales agreement for military exports.

Indirect Offsets: Contractual arrangements that involve goods and services unrelated to the exports referenced in the sales agreement.

Co-production: Overseas production based upon government-to-government agreement that permits a foreign government(s) or producer(s) to acquire the technical information to manufacture all or part of a U.S. origin defense article. It includes government-to-government licensed production. It excludes licensed production based upon direct commercial arrangements by U.S. manufacturers.

Licensed Production: Overseas production of a U.S. origin defense article based upon transfer of technical information under direct commercial arrangements between a U.S. manufacturer and a foreign government or producer.

Subcontractor Production: Overseas production of a part or component of a U.S. origin defense article. The subcontract does not necessarily involve license of technical information and is usually a direct commercial arrangement between the U.S. manufacturer and a foreign producer.

Overseas Investment: Investment arising from the offset agreement, taking the form of capital invested to establish or expand a subsidiary or joint venture in the foreign country.

Technology Transfer: Transfer of technology that occurs as a result of an offset agreement and that may take the form of: research and development conducted abroad; 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 a foreign entity.

Countertrade: In addition to the types of offsets defined above, various types of commercial countertrade arrangements may be required. A contract may include one or more of the following mechanisms:

> Barter: A one-time transaction only, bound under a single contract that specifies the exchange of selected goods or services for another of equivalent value.

Counter-purchase: An agreement by the initial exporter to buy (or to find a buyer for) a specific value of goods (often stated as a percentage of the value of the original export) from the original importer during a specified time period.

Compensation (or Buy-Back): An agreement by the original exporter to accept as full or partial repayment products derived from the original exported product.

1.4 Partial Listing of Previous U.S. Government Reports

October 1985	***Assessment of the Effects of Barter and Countertrade Transactions on U.S. Industries*** - U.S. International Trade Commission**.**
December 1985	***The Impact of Offsets in Defense-Related Exports*** - Office of Management and Budget**.**
December 1986	***Second Annual Report on the Impact of Offsets in Defense-Related Exports*** - Office of Management and Budget.
December 1987	***Impact of Offsets in Defense-Related Exports: A Summary of the First Three Annual Reports*** - Office of Management and Budget.
December 1988	***Offsets in Military Exports*** - Office of Management and Budget**.**
April 1990	***Report on Offsets in Military Exports*** **-** Office of Management and Budget.
April 1996	***Military Exports: Offset Demands Continue to Grow*** **-** U.S. General Accounting Office.

2. Statistical Assessment

The data collected for this report covers only the years 1993 and 1994, which is not a long enough period to establish definitive trends in offsets. However, a comparison of this latest data with previously collected offsets data was made to see if any trends were discernable. Two as yet inconclusive trends are, first, a minor decline in the percent of offset obligations to defense export sales contracts, and second, a rather significant increase in the use of indirect offsets relative to direct offsets.

The decrease in percent offsets was very small, from 57.2 percent average for the 1980-1987 period to 54.8 percent for the latter period, although this number is calculated absent two major sales to the Middle East and Asia. These two sales totaled almost $10 billion, and represented more than half the reported exports for the two-years. Had these sales been included, the world average offsets figure would have been misleading.

The increase in indirect offsets is based on a comparison of OMB data on new offset agreements with BXA actual transaction data. The OMB data on new agreements reports direct offsets at 37 percent, indirect offsets at 41 percent, and "unknown" at 22 percent. Here, indirect represent about 53 percent of the known OMB reported offsets. BXA transaction data reports direct offsets at 31 percent and indirect at 62 percent. Unknown or combination offsets are 7.5 percent. Indirect represent about 67 percent of the known offsets.

2.1 Historical Perspective, 1980-1987

Offsets data previously collected by the U.S. Government under Section 309 of the Defense Production Act as amended has been partially reprinted in this assessment to provide a historical perspective. This section is a summary of the data collected and prepared by the Interagency Coordinating Committee on Offsets Reports, chaired by the Office of Management and Budget, and published in the December 1988 *Offsets in Military Exports* report. Collected during 1988 from a mandatory survey of 36 U.S. defense prime contractors, the data covers U.S. military export sales contracts (valued at $500,000 or more) that involved offset agreements between January 1, 1980, and December 31, 1987.

Table 1 presents export sales contracts with offset agreements totaled $34.8 billion from 1980 to 1987. These contracts involved 30 different countries or country groups (i.e., NATO or EPG). The largest value of export contracts in a single year was $8.7 billion reported in 1983. The

smallest value, $2.2 billion, was reported in 1986. The offset agreements, or obligations associated with these contracts, are shown on Table 2. The obligations were valued at $19.9 billion, or 57.2 percent of the value of the sales. Several countries, including Spain, Sweden, and the United Kingdom, had offsets of greater than 100 percent relative to the sales contract.[1]

Table 3 highlights the value of shipments as a percent of sales contracts that were reported through the end of 1987. Table 4 further analyzes the shipment data, breaking the statistics down by SIC code and employee years, per dollar of shipment.

Table 5 details SIC codes and the types of goods and services covered by the offset agreements. The defense prime contractors reported that for about one-half of the value of the offset obligations, the types of goods and services to be provided were not determined at the same time the contract was executed. Where the determination was made, most of the value was to be accounted for by aircraft engines and engine parts (SIC 3724), aircraft parts and equipment (SIC 3728), and radar and related navigational equipment (SIC 3812).

Table 6 indicates that co-production and subcontractor production offsets accounted for 88.5 percent of direct offset obligations. Countertrade accounted for 65 percent of all indirect offset obligations. For all offset obligations, direct accounted for 37 percent, indirect accounted for 41 percent, with the remaining 22 percent in a "not known" category.

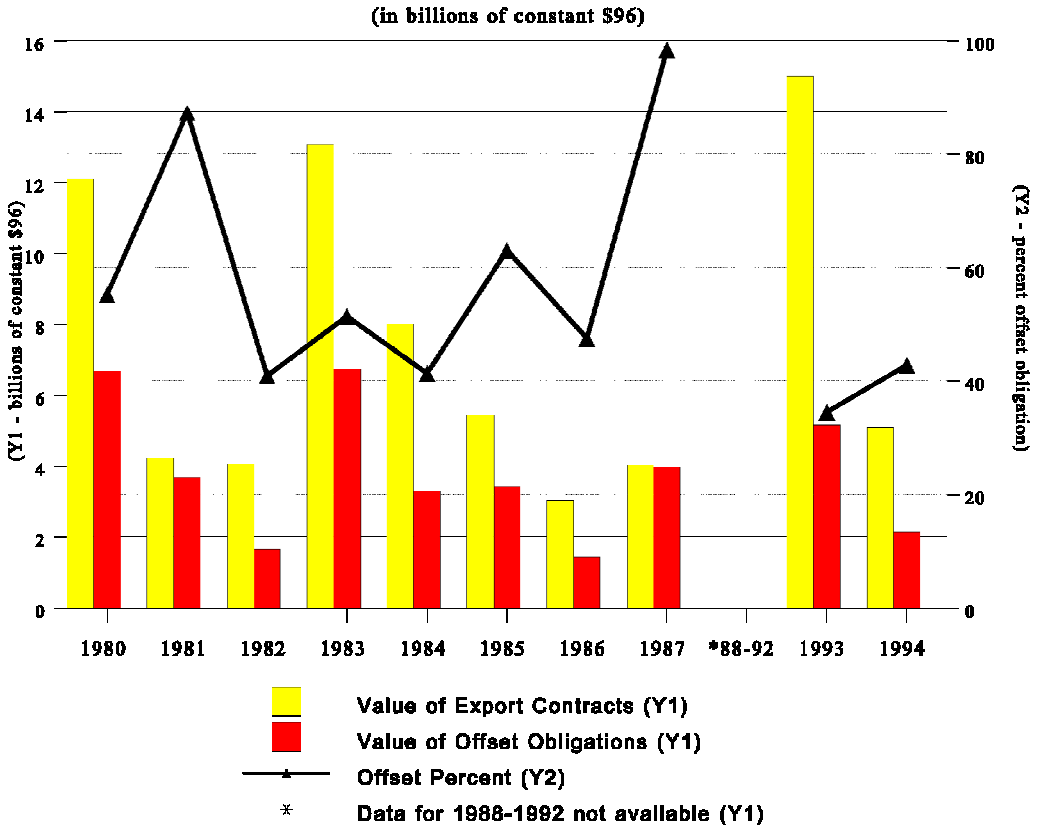
To implement these agreements, the firms were allowed an unweighted average of 11 years, with allowances ranging from six years by South Korea to 21 years by Sweden (Table 7). Only 50 percent of the offset obligations were implemented by the end of 1987. Of these implemented offset obligations, about 31 percent were direct and 61 percent indirect (Table 8). Subcontractor production accounted for over 50 percent of direct offsets implemented; subcontractor production and countertrade accounted for 80 percent of all indirect offsets implemented. For the direct and indirect offset obligations that were implemented through 1987, subcontractor production accounted for 44 percent of the total. Table 9 highlights the implementing parties for all offsets implemented from 1980-1987.

[1] For more accurate comparability with 1993 and 1994 data, which will be presented shortly, the export sales contracts and offset obligations were translated to constant 1996 dollars using the GDP deflator. Restated, the 1980-1987 export sales contracts were $53.9 billion, and the related offset agreements $30.9 billion.

2.1.2 Comparison of OMB and BXA Data:

Graph 1 compares the OMB 1980 to 1987 offset data with the BXA 1993 and 1994 data. No data was collected for the years 1988 through 1992. Three elements are shown on the graph: the value of export sales contracts (the grey bar), the value of offset obligations (the black bar), and the percent of the offsets to sales agreements (the line with arrowheads). The percentages of offset obligations to new export contract values fluctuate widely from year to year, as do the values of the export sales contracts and offset obligations. The lowest percentage occurred in 1993, at slightly under 35 percent, and the highest in 1987, at over 98 percent. In 1993, there was one export sale to Taiwan of nearly $6 billion with limited offsets. If this particular sale were removed, the overall percentage of new offset obligations would increase from 34.5 percent to 52.1 percent in 1993. Similarly, removal of a major Middle Eastern sale would push the offset obligation in 1993, to nearly 70 percent.

Graph 1: Offset Obligations: Selected Years



Source: *Offsets in Military Exports*, OMB, and BXA *Federal Register* Offset Data

2.2 BXA Statistics, 1993-1994

2.2.1 Summary

This section of the report analyzes new offset obligations and offset transactions data provided by U.S. defense prime contractors in response to the December 1994 BXA *Federal Register* notice. The data covers the years 1993 and 1994. Future BXA Offsets in Defense Trade reports will add annual increments to this data. In summary, new offset obligations in 1993 were $4.8 billion based on sales contracts of $13.9 billion. In 1994, the new obligations were $2.0 billion based on sales contracts of $4.8 billion. Offset transactions, which are counted toward the fulfillment of existing offset agreements, totaled about $1.9 billion in both 1993 and 1994. Roughly one-third of these offset transactions for both years were direct, or related to the defense system listed on the export sales contract. Also, about three-fourths of all transactions (i.e., direct and indirect) involved the purchase or subcontracting of goods and services, or the transfer of technology.

European and NATO allies have the highest overall offset obligation demands. In 1993 and 1994, European countries represented less than one-fourth of the value of the export contracts, but more than 45 percent of the value of the new offset requirements. The percentage of offsets to export contract values reported for Europe as a whole was 69 percent. For the Middle East and Pacific Rim countries, these percentages were much lower, although individual countries had rates above 60 percent. The recent trend shows a relative increase in export and offset activity to regions outside of Europe and NATO. The worldwide decline in military spending has shifted the emphasis of many offset obligations toward products and technology that benefit commercial sectors.

The original OMB and BXA data as well as a newly released GAO report[2] also support a trend toward newer buyer countries seeking to diversify their economies rather than build or maintain a defense industry. Pacific Rim countries such as Singapore, South Korea, and Taiwan are seeking offset deals that include increased technology transfer, particularly in aircraft design, to become self-sufficient in defense production and to overcome industrial weaknesses that are hindering their efforts to compete in the world aerospace market with U.S. and European manufacturers. Japan's policy of co-producing defense items has a similar objective.

[2] "Military Exports: Offset Demands Continue to Grow," U.S. General Accounting Office, Washington, DC. April 1996.

Aerospace weapon systems (aircraft, engines, missiles, etc.) export sales overwhelmingly dominate offset agreements. In fact, about 90 percent of the total value of actual offset transactions reported were offsets referenced to aerospace-related sales agreements. However, of the total actual transactions, aerospace products and services represented slightly over 51 percent, with the remainder allocated across dozens of other industry sectors. In total, offset transactions were identified to a conservative estimate of 127 SIC industry groupings at the 4, 3, or 2-digit levels. Had all transactions been identified to the 4-digit level, many more industries would undoubtedly be represented. The top 40 industry groups each involved more than $10 million in transactions for the two years. Some of the more dominant industries are shown in the table below. The industries are shown at the 2, 3, or 4-digit level.[3]

Table 10. Selected SIC Industry Groups Reported in Offset Transactions

SIC Code	Industry Description	% of Total Offsets
372	Aircraft and Parts	38.2
3728	Aircraft Parts	5.6
367	Electronics	9.6
35	Industrial Machinery	9.2
357	Computer Hardware	1.5
3731	Shipbuilding and Repair	8.3
366	Telecommunications Equipment	2.9
8742	Management Consulting Services	1.6

Source: BXA *Federal Register* Offset Data

[3] The listed industries are for the greatest level of detail provided by the industry reports. Some reports were at the 2-digit level, while others were at 3- or 4-digit levels. The industries shown on the table do not overlap.

2.2.1 New Offset Agreements

2.2.2.1 1993 New Offset Agreements: As Table 11 highlights, there were 29 new agreements reported by 18 companies in 1993. Almost half of these new obligations were with European countries. These sales were made to the following eight countries: Denmark; Greece; the Netherlands; Norway; Portugal; Spain; Switzerland; and the United Kingdom. They collectively account for the highest offset percentage, 78 percent of that region's sales, although these sales accounted for only 21 percent of the dollar value of 1993 total sales. On average the European offset agreements are to be met within 91 months.

Table 11. New Offset Obligations by Region, 1993

Region	# Deals	Sale ($mil)	Offset ($mil)	% Offset	# Months
Europe	14	2,985.017	2,338.053	78.3%	91
Middle East	4	4,143.861	1,462.100	35.3%	96
Pacific Rim	7	6,717.659	943.766	14.0%	78
Other Areas	4	98.467	50.515	51.3%	83
World Total	29	13,945.004	4,794.434	34.4%	87
World w/o large sales	*27*	*4,045.004*	*2,794.434*	*69.1%*	

* The well publicized multi-billion dollar sales of F-16s to Taiwan and F-15s to Saudi Arabia had an unusually large influence on the World totals for offsets. The numbers in italics are perhaps more representative of the true incidence of offsets.

Source: BXA *Federal Register* Offset Data

Pacific Rim nations — Malaysia, South Korea, and Taiwan — accounted for half of new export sales, while accounting for the smallest overall offset percentage, at only 14 percent of the value.[4] For 1993 Pacific Rim agreements also have the shortest average completion time, 78 months.

[4] The share of total sales and corresponding offsets reported for Pacific Rim nations is understated, perhaps significantly, because of an interpretation error in BXA's *Federal Register* data collection request. As a result, no data was submitted on co-production offsets with Japan. Almost all offset arrangements with Japan are related to government-to-government co-production agreements.

The remaining new agreements in 1993 were equally divided between the Middle East and an "Other Areas" category. Sales to Middle Eastern countries were almost 30 percent of reported 1993 total export sales, making the region second only to the Pacific Rim in terms of dollar value of sales. The offset requirement averages 35 percent of that region's sales. Countries included in this category are Kuwait, Saudi Arabia, and Turkey.[5] The average fulfillment requirement for 1993 Middle Eastern agreements is 96 months, the longest time frame of any region.

The final regional category is defined as "Other Areas," based upon either the unique geographic or trade relationships the United States has with these countries. In 1993 new agreements to Canada and Israel were included in this classification. The average offset percentage to these countries was second only to that for Europe, yet total sales were much smaller than those to other regions, accounting for less than one percent. The average fulfillment requirement for 1993 agreements was 83 months.

2.2.2.2 1994 New Offset Agreements: The total number of new offset agreements reported in 1994 was 49, a significant increase over the number of new agreements entered into in 1993. These 49 agreements were reported by 18 companies. While the number of new obligations increased in comparison to 1993, the total dollar value decreased by almost 57.3 percent. The regional distribution of these new agreements followed a similar pattern to 1993, with the largest number of agreements with European nations, followed by Pacific Rim countries.

Table 12. New Offset Obligations by Region, 1994

Region	# Deals	Sale ($mil)	Offset ($mil)	% Offset	# Month
Europe	20	1,508.234	764.830	50.7%	88
Middle East	6	819.200	417.300	50.9%	88
Pacific Rim	9	1,915.447	508.138	26.5%	72
Other Areas	14	549.539	358.448	65.2%	63

[5] Although a member of NATO, for purposes of this report Turkey is included in the Middle Eastern category.

World Total	49	4,792.420	2,048.716	42.8	78

Source: BXA *Federal Register* Offset Data

The overall offset percentage for the European agreements was significantly less than those in 1993, dropping from 78 percent to almost 51 percent. These obligations were made with eleven countries: Belgium; Greece; Italy; the Netherlands; Norway; Portugal; Slovenia; Spain; Sweden; Switzerland; and the United Kingdom. The average time requirement to fulfill the agreements also declined slightly from 1993 levels, dropping from 91 to 88 months.

New offset agreements with Pacific Rim nations increased slightly from seven in 1993 to nine in 1994. As was seen with the European agreements, the dollar value of the Pacific Rim agreements dropped by 28 percent in comparison to 1993, while the percentage offset rose to almost 27 percent. The average number of months to fulfill the agreements was 72 months, down from 78 months in 1993. The Pacific Rim nations with whom new obligations were entered in 1994 were Singapore, South Korea, and Taiwan.

There was also an increase in the number of new agreements formed in the Middle East, rising from four to six, but again, the dollar value of these new obligations was almost 20 percent lower. The percentage of the offsets rose, however, from 35 percent in 1993 to almost 51 percent in 1994. New deals were reported with Saudi Arabia, Turkey, and the United Arab Emirates. The average number of months for the offset fulfillment was 88, equal to that for the European agreements, but lower than the average of 96 months in 1993.

The remaining regional category, "Other Areas," is the only grouping which shows an increase in new offset agreements, total dollar value, and the offset percentage when compared to 1993. The number of new transactions reported rose from four to 14; the value of these sales increased five-fold. The offset percentage for these obligation was 65 percent, an increase from 51 percent in 1993. The average number of months to fulfill these agreements was 63, much lower than the average of 83 months the year before. The nations included in this category are Australia, Canada, and Israel.

Collectively, the number of new offset agreements entered into was higher in 1994 than in 1993, while the total value of these agreements dropped sharply from $4,794 million in 1993, to $2,049 million in 1994. This was accounted for mostly by the decline in Europe, which fell from $2.33 billion to only $765 million in 1994. Europe accounted for only 37 percent of the new obligations established in 1994. Export sales also fell sharply over the two years from almost $14 billion to $4.8 billion. The average offset percentage increased somewhat, from 34.4 percent in 1993, to 42.8 percent in 1994. The average length of time to fulfill these new offset agreements varied by year, averaging 87 months (7.25 years) for those new obligations in 1993

and 78 months (6.5 years) for those in 1994. These time frames are much shorter than the average for the 1980-1987 period, which was 132 months (11 years).

2.2.3 Offset Transactions

While the previous section provides an overview of the new agreements reported in 1993 and 1994, this section provides a detailed view of the actual offset transactions reported for this period. Industry reported over 1,000 transactions. The great majority of these offset transactions are not connected with the new agreements addressed in the last section. They are in some cases continuing fulfillments of offset obligations agreed to over 10 years ago. Each transaction contains over a dozen data elements as reported by industry. The resulting database can be compiled in numerous ways. The most important include direct and indirect, by type offset, by region, and a breakout by industrial sector. The synopsis of the data presented in these various ways is provided in a series of tables in this section.

2.2.3.1 Transactions Summary: As shown on Table 13 on the next page, a total of 26 companies submitted offset transactions data for the 1993-1994 reporting period. Of these companies, 23 reported in 1993, and 21 reported in 1994. The transactions reference a total of 107 defense export systems sales that have taken place in the last 15 years or so. These systems were exported to 37 different country destinations. Europe was, by far, the region with the highest number of destination listings with 68 percent of the total. Countries in the Pacific Rim[6] comprised 14 percent and the Middle East region comprised eight percent. "Other Areas" destinations included Australia, Canada, Israel, and New Zealand; these comprised 11 percent of the total.

[6] As mentioned earlier, the share of total sales and corresponding offsets reported for Pacific Rim nations is understated, perhaps significantly, because of an interpretation error in BXA's *Federal Register* data collection request. As a result, no data was submitted on co-production offsets with Japan.

Table 13. Transactions Summary, 1993-1994 by Referenced Exported Systems			
Referenced Export Systems	**1993**	**1994**	**1993-1994**
Companies Reporting	23	21	26
Exported Systems	70	70	107
Export Destinations	33	32	37
Destinations by Region:			
Europe	22	22	25
Middle East	2	3	3
Pacific Rim	5	4	5
Other Areas	4	3	4

Source: BXA *Federal Register* Offset Data

Looking beyond the referenced exported systems, an overview of reported transactions from the recipients' side appears on Table 14. A total of 26 U.S. firms reported 1,010 offset related transactions during the 1993-1994 reporting period. A total of 503 different entities in both the public and private sectors were recipients or beneficiaries of these transactions.

On a regional basis, Europe had the most transactions with 672 or two-thirds of the total. The countries of Australia, Canada, Israel and New Zealand ("Other Areas" region) together ranked second with 177 or 17.5 percent. The Pacific Rim ranked third with 124 or 12 percent and the Middle East region received the least number of transactions with 37 or only 3.7 percent of the total. Based on the new offset agreements data, it is likely that the value of transactions with Europe will decline in the future, as the Middle East and Asia increase.

The actual value of all transactions during the two year reporting period was $3.8 billion. The actual dollar value of transactions by region follows a similar ranking pattern with Europe receiving the highest amount by a large margin with $2.6 billion (69 percent). The Pacific Rim region, ranking second, received $585 million or 15 percent; the "Other" region, ranking third,

received $501 million or 13 percent; and the Middle East, ranking fourth, received $100 million or 2.6 percent.

Table 14. Transactions Summary, 1993-1994 by Reported Transactions			
Transaction Data	**1993**	**1994**	**1993-1994**
Companies Reporting	23	21	26
Reported Transactions	445	565	1,010
Transaction Recipients (Public & Private)	271	334	503
Transactions by Region:			
Europe	302	370	672
Middle East	15	22	37
Pacific Rim	45	79	124
Other Areas	83	94	177
Transactions by Region: (Actual Value)	$1,898,880	$1,935,325	$3,834,205
Europe (in $000s)	$1,454,531	$1,193,724	$2,648,255
Middle East (in $000s)	$52,730	$47,290	$100,020
Pacific Rim (in $000s)	$172,784	$412,026	$584,810
Other Areas (in $000s)	$218,835	$282,285	$501,120
Transactions by Region: (Credited Value)	$2,214,620	$2,205,875	$4,420,495
Europe (in $000s)	$1,686,509	$1,321,847	$3,008,256
Middle East (in $000s)	$91,730	$109,920	$201,650
Pacific Rim (in $000s)	$179,379	$490,459	$669,838
Other Areas (in $000s)	$257,002	$283,649	$540,651

Source: BXA *Federal Register* Offset Data

The average dollar value per transaction for all regions was approximately $3.8 million. The Pacific Rim, highly focused on aerospace, had the highest average dollar value per transaction at $4.7 million, with Europe second at $3.9 million. The "Other Areas" region and the Middle East had similar individual transaction values with $2.8 million and $2.7 million.

The total credit value for all transactions reported in 1993-1994 was approximately $4.4 billion, exceeding actual total value by $586 million, or about 15 percent. Credit values are dollar values credited toward offset obligations. While most transactions receive no special credit, the buyer government may provide incentives in the form of extra credits to the offset fulfiller to transfer technology, or create business for a domestic company. The credit value for Europe is again the highest value for the regions highlighted at $360 million in extra credit (13.6 percent more than actual). The Pacific Rim extra value is $85 million (14.5 percent), and again the "Other Areas" region is $40 million (7.9 percent). The Middle East, however, is the most spectacular at $102 million, more than 100 percent above actual transaction values. Most of this credit accompanies direct offset "purchases," which are shown on Table 20A and 20B.

2.2.3.2 Offsets Transactions by Type for Direct, Indirect, and Combination: Tables 15 through 18 are designed to provide an overview of industry-reported transactions by offset type for 1993 and 1994. The actual value of the transactions and the resulting amounts credited toward the offset obligations are each detailed for the nine types of offsets on these tables. Table 15 contains the aggregate totals for these values, while Tables 16, 17, and 18 breakout subtotals for direct, indirect, and combination offsets.[7] The particular order in which the offset types are displayed is arbitrarily taken from the 1993 values shown on Table 15, which are arranged from largest to smallest.

[7] Combination offsets are those which are partly direct and partly indirect.

Table 15: Offset Transactions Subgrouped by Type, 1993 and 1994 Total for Direct, Indirect, and Combination (Both)
(in thousands of dollars)

Year	Category	Offset Type	Actual Transaction Values			Values Credited Toward Offsets		
			Value ($000s)	% of Category	% of All	Value ($000s)	% of Category	% of All
1993	**Total**	**Total**	**$1,898,880**	**100%**	**100%**	**$2,214,620**	**100%**	**100%**
1993	Total	Purchase	665,839	35.1%	100%	794,975	35.9%	100%
1993	Total	Subcontractor Activity	375,919	19.8%	100%	477,190	21.5%	100%
1993	Total	Credit Transfer	278,221	14.7%	100%	304,523	13.8%	100%
1993	Total	Technology Transfer	183,307	9.7%	100%	203,504	9.2%	100%
1993	Total	Training	167,994	8.8%	100%	186,027	8.4%	100%
1993	Total	Other	119,840	6.3%	100%	137,042	6.2%	100%
1993	Total	Lic. Production/Assembly	37,851	2.0%	100%	41,451	1.9%	100%
1993	Total	Co-production	35,550	1.9%	100%	35,550	1.6%	100%
1993	Total	Investment	34,358	1.8%	100%	34,358	1.6%	100%
1994	**Total**	**Total**	**$1,935,325**	**100%**	**100%**	**$2,205,875**	**100%**	**100%**
1994	Total	Purchase	601,701	31.1%	100%	682,829	30.9%	100%
1994	Total	Subcontractor Activity	360,323	18.6%	100%	372,379	16.9%	100%
1994	Total	Credit Transfer	3,494	0.2%	100%	21,639	1.0%	100%
1994	Total	Technology Transfer	462,569	23.9%	100%	495,849	22.5%	100%
1994	Total	Training	107,912	5.6%	100%	191,520	8.7%	100%
1994	Total	Other	149,602	7.7%	100%	164,230	7.4%	100%
1994	Total	Lic. Production/Assembly	45,424	2.3%	100%	67,629	3.1%	100%
1994	Total	Co-production	111,895	5.8%	100%	112,185	5.1%	100%
1994	Total	Investment	92,405	4.8%	100%	97,614	4.4%	100%

Source: BXA *Federal Register* Offset Data

Table 15 shows that, in 1994, while the overall totals were nearly the same, significant changes occurred in nearly every type's value from the previous year. For example, technology transfer, in the fourth position, rose from $183 million in 1993 to $463 million in 1994, an increase of more than 150 percent, advancing technology transfer to second place in 1994. In the opposite direction, credit transfers, in the third position, fell from $278 million to only $3.5 million, down almost 99 percent, putting credit transfers in last place in 1994.

This volatility is partly explained by the steady attrition of transactions on completed older agreements and an increase of new ones. Annual regional variations may also explain some of the volatility. Europe, for instance, dropped from $1.45 billion in offset transactions in 1993 to $1.19 billion in 1994, down about 18 percent. However, the Pacific Rim was up dramatically, rising from $173 million to $412 million, an increase of almost 140 percent. The technology transfer referred to above was the result of a major jump in indirect offsets of that type in the Pacific Rim in 1994 and a doubling of European direct offsets of that type in that year (see Tables 20A through 22A for type details by region).

Purchases are the leading offset transaction type in each of the two years, comprising well over 30 percent of the value. Purchases are predominantly indirect: in fact, indirect offsets account for more than three-fourths of their total. For 1993, purchases made up 35 percent of the actual transaction value reported, with subcontractor activity accounting for almost 20 percent and credit transfers accounting for almost 15 percent. In 1993 credited values exceeded actual values by 16.6 percent. In 1994, purchases still made up a significant 31 percent of the actual transaction value; subcontractor activity fell to just under 19 percent and technology transfer grew from about 10 percent in 1993 to 24 percent of actual transaction value in 1994. The same pattern is revealed in the values credited toward offsets in the two years. In 1994 credited values once again exceeded actual values by 14 percent. Other types, such as marketing assistance, maintenance agreements, rentals, unspecified sales, investment analysis, and other miscellaneous items, were 6.3 percent in 1993, and 7.7 percent in 1994.

The information in table 16 shows that in 1993, direct offsets were $582.4 million in transaction value; in 1994, the transaction value figure rose to about $600 million. Direct offsets accounted for approximately 30 percent of all offsets for both years in terms of actual transaction values. The three largest types of direct offsets for 1993 (in terms of transaction values) were subcontractor activity, with almost 31 percent; training, with 28 percent; and purchases, with 18 percent of direct offsets.

Once again, the same rankings are shown in the values credited toward offsets. For 1994, purchases fell to 15.5 percent of the transaction values. The three leading categories were subcontractor activity, with 24.4 percent; technology transfer, at 19.1 percent (up from 11.2 percent of the total in 1993); and co-production, with 18.5 percent of the transaction value (up from 6 percent in 1993). Note also that subcontractor activity, training, licensed production, and co-production are each substantial shares of all offsets. These types of offsets are historically direct.

Table 17 shows that indirect offsets totaled $1.19 billion (actual transaction value) in 1993 and $1.17 billion in 1994. In 1993 indirect offsets made up nearly 63 percent of all offsets (in transaction value); this percentage fell to just under 61 percent in 1994. In 1993, purchases dominated indirect offset transaction values, accounting for 43.5 percent of indirect offsets reported and more than three-fourths of all purchases. Credit transfers were next, with 23 percent of total transaction value, followed by subcontractor activity, with 15 percent. In 1994, purchases were still the largest type in terms of transaction value, accounting for 39 percent of the total that year, and again accounting for over three-fourths of all offset purchases. Technology transfer was next, with almost one quarter of the transaction value (up from only 8 percent the year before), and subcontractor activity followed with about 17 percent (an increase from 1993, when it accounted for 15 percent).

Information in table 18 shows that combination offsets made up less than 7 percent of all offsets in 1993, at $126 million, and about 8 percent in 1994, at $160.9 million, in terms of actual transaction value. For 1993, the largest type was purchases, accounting for 34.2 percent of all combination offsets, followed by technology transfer, with 21.6 percent, and investment, with 19.5 percent of actual transaction value. In 1994, technology transfer made up 39 percent of combination offset transaction value, followed by purchases, with 29 percent, and investment, with 18.2 percent. A breakout of direct and indirect portions of these was not provided, although a reasonable assumption would be that they break about the same as declared direct and indirect offset transactions. The type of breakouts for these also leads to the same conclusion.

Table 16: Offset Transactions Subgrouped by Type, 1993 and 1994 Total for Direct Offsets

(in thousands of dollars)

Year	Category	Offset Type	Actual Transaction Values			Values Credited Toward Offsets		
			Value ($000s)	% of Category	% of All	Value ($000s)	% of Category	% of All
1993	**Direct**	**Total**	**$582,437**	**100%**	**30.1%**	**$683,182**	**100%**	**30.8%**
1993	Direct	Purchase	104,694	18.0%	15.7%	144,755	21.2%	18.7%
1993	Direct	Subcontractor Activity	178,570	30.7%	47.5%	207,242	30.3%	43.4%
1993	Direct	Credit Transfer	0	0.0%	0.0%	0	0.0%	0.0%
1993	Direct	Technology Transfer	64,943	11.2%	35.4%	84,107	12.3%	41.3%
1993	Direct	Training	164,372	28.2%	97.8%	176,205	25.8%	94.7%
1993	Direct	Other	9,588	1.7%	8.0%	10,603	1.6%	7.7%
1993	Direct	Lic. Production/Assembly	25,834	4.4%	68.3%	25,834	3.8%	62.3%
1993	Direct	Co-production	34,435	5.9%	96.9%	34,435	5.0%	96.9%
1993	Direct	Investment	0	0.0%	0.0%	0	0.0%	0.0%
1994	**Direct**	**Total**	**$599,967**	**100.0%**	**31.0%**	**$773,369**	**100.0%**	**35.1%**
1994	Direct	Purchase	93,003	15.5%	15.5%	132,511	17.1%	19.4%
1994	Direct	Subcontractor Activity	146,139	24.4%	40.6%	158,195	20.5%	42.5%
1994	Direct	Credit Transfer	494	0.1%	14.1%	18,639	2.4%	86.1%
1994	Direct	Technology Transfer	114,494	19.1%	24.8%	147,706	19.1%	29.8%
1994	Direct	Training	50,913	8.5%	47.2%	98,696	12.8%	51.5%
1994	Direct	Other	46,602	7.8%	31.2%	50,405	6.5%	30.7%
1994	Direct	Lic. Production/Assembly	33,302	5.6%	73.3%	51,907	6.7%	76.8%
1994	Direct	Co-production	111,170	18.5%	99.4%	111,460	14.4%	99.4%
1994	Direct	Investment	3,850	0.6%	4.2%	3,850	0.5%	3.9%

Source: BXA *Federal Register* Offset Data

Table 17: Offset Transactions Subgrouped by Type, 1993 and 1994 Total for Indirect Offsets

(in thousands of dollars)

Year	Category	Offset Type	Actual Transaction Values			Values Credited Toward Offsets		
			Value ($000s)	% of Category	% of All	Value ($000s)	% of Category	% of All
1993	**Indirect**	**Total**	**$1,190,378**	**100%**	**62.7%**	**$1,400,546**	**100%**	**63.2%**
1993	Indirect	Purchase	518,045	43.5%	77.8%	607,120	43.4%	76.4%
1993	Indirect	Subcontractor Activity	179,348	15.1%	47.7%	251,947	18.0%	52.8%
1993	Indirect	Credit Transfer	278,221	23.4%	100.0%	304,523	21.7%	100.0%
1993	Indirect	Technology Transfer	91,131	7.7%	49.7%	90,936	6.5%	44.7%
1993	Indirect	Training	3,622	0.3%	2.2%	9,822	0.7%	5.3%
1993	Indirect	Other	110,252	9.3%	92.0%	126,439	9.0%	92.3%
1993	Indirect	Lic. Production/Assembly	0	0.0%	0.0%	0	0.0%	0.0%
1993	Indirect	Co-production	0	0.0%	0.0%	0	0.0%	0.0%
1993	Indirect	Investment	9,758	0.8%	28.4%	9,758	0.7%	28.4%
1994	**Indirect**	**Total**	**$1,174,428**	**100%**	**60.7%**	**$1,267,076**	**100%**	**57.4%**
1994	Indirect	Purchase	462,110	39.0%	76.8%	503,731	39.8%	73.8%
1994	Indirect	Subcontractor Activity	204,159	17.4%	56.7%	204,159	16.1%	54.8%
1994	Indirect	Credit Transfer	3,000	0.3%	85.9%	3,000	0.2%	13.9%
1994	Indirect	Technology Transfer	285,075	24.3%	61.6%	284,843	22.5%	57.4%
1994	Indirect	Training	56,999	4.9%	52.8%	92,224	7.3%	48.2%
1994	Indirect	Other	103,000	8.0%	68.8%	113,825	9.0%	69.3%
1994	Indirect	Lic. Production/Assembly	105	0.0%	2.3%	105	0.0%	0.2%
1994	Indirect	Co-production	725	0.1%	0.6%	725	0.1%	0.6%
1994	Indirect	Investment	59,255	5.1%	64.1%	64,464	5.1%	66.0%

Source: BXA *Federal Register* Offset Data

Table 18: Offset Transactions Subgrouped by Type, 1993 and 1994 Total for Combination Offsets (Both)

(in thousands of dollars)

Year	Category	Offset Type	Actual Transaction Values			Values Credited Toward Offsets		
			Value ($000s)	% of Category	% of All	Value ($000s)	% of Category	% of All
1993	**Both**	**Total**	**$126,065**	**100%**	**6.7%**	**$130,893**	**100%**	**5.9%**
1993	Both	Purchase	43,100	34.2%	6.5%	43,100	32.9%	5.4%
1993	Both	Subcontractor Activity	18,000	14.3%	4.8%	18,000	13.8%	3.8%
1993	Both	Credit Transfer	0	0.0%	0.0%	0	0.0%	0.0%
1993	Both	Technology Transfer	27,234	21.6%	14.9%	28,461	21.7%	14.0%
1993	Both	Training	0	0.0%	0.0%	0	0.0%	0.0%
1993	Both	Other	0	0.0%	0.0%	0	0.0%	0.0%
1993	Both	Lic. Production/Assembly	12,017	9.5%	31.7%	15,617	11.9%	37.7%
1993	Both	Co-production	1,115	0.9%	3.1%	1,115	0.9%	3.1%
1993	Both	Investment	24,600	19.5%	71.6%	24,600	18.8%	71.6%
1994	**Both**	**Total**	**$160,930**	**100%**	**8.3%**	**$165,430**	**100%**	**7.5%**
1994	Both	Purchase	46,588	29.0%	7.7%	46,588	28.2%	6.8%
1994	Both	Subcontractor Activity	10,025	6.2%	2.8%	10,025	6.1%	2.7%
1994	Both	Credit Transfer	0	0.0%	0.0%	0	0.0%	0.0%
1994	Both	Technology Transfer	63,000	39.2%	13.6%	63,300	38.3%	12.8%
1994	Both	Training	0	0.0%	0.0%	600	0.4%	0.3%
1994	Both	Other	0	0.0%	0.0%	0	0.0%	0.0%
1994	Both	Lic. Production/Assembly	12,017	7.5%	26.5%	15,617	9.4%	23.1%
1994	Both	Co-production	0	0.0%	0.0%	0	0.0%	0.0%
1994	Both	Investment	29,300	18.2%	31.7%	29,300	17.7%	30.0%

Source: BXA *Federal Register* Offset Data

2.2.3.3 Offset by Region for Direct, Indirect and Combination: Table 19 breaks down offset totals by region and by category of offset. The data shows that European offset transactions make up more than 60 percent of each category for both years, with the exception of 1994, when transactions with "Other Areas" countries (Canada, Australia, New Zealand, and Israel) made up almost 2/3 of the actual transaction value for the combination offsets..

The portion of total offsets accounted for by direct transactions varied by region. The 1993 data for Europe shows that direct offsets made up only 25.8 percent of the total European offsets value of $1.45 billion, while in the Pacific Rim, direct offsets accounted for 55.5 percent of the region's total. The 1994 figures show an even wider variation: direct offsets accounted for almost 65 percent of all offsets for the Middle East, while for "Other Areas" countries, direct offsets were only 27.4 percent of the region's total. Europe captured nearly two-thirds of the world's direct offset transactions in 1993 and 1994. In 1993, Europe alone claimed more than three-fourths of the offset transactions, and almost 85 percent of the indirect category.

Similar variations appear in the data collected for indirect offsets for each region. As Table 19 shows, in 1993 indirect offsets made up 36.9 percent of the Pacific Rim's total offset value, while they accounted for 68.7 percent of Europe's total. In 1994, however, indirect offsets made up a larger portion of the Pacific Rim's offsets, growing to 66.7 percent. In Europe, indirect offsets accounted for 63.7 percent of the year's total for the region, a slight decrease. Both the Middle East and the "other" region saw a significant decrease in the percentage of total offsets accounted for by indirect offsets.

For the "Both," or combination, category, the "Other Areas" region led with 15 percent of its total offsets in 1993 and 37.6 percent in 1994 accounted for by these offsets. In contrast, there were no combination offsets reported for the Middle East for either year.

Table 19: Offset Transactions by Region, 1993 and 1994
Total for Direct, Indirect, and Combination (Both)
(in thousands of dollars)

		Europe: Actual Transaction Values			Pacific Rim: Actual Transaction Values			Middle East: Actual Transaction Values			Other Areas*: Actual Transaction Values		
Year	Category	Value ($000)	% of category	% of region total	Value ($000)	% of category	% of region total	Value ($000)	% of category	% of region total	Value ($000)	% of category	% of region total
1993	**Total**	**$1,454,531**	**76.6%**	**100.0%**	**$172,784**	**9.1%**	**100.0%**	**$52,190**	**2.7%**	**100.0%**	**$218,835**	**11.5%**	**100.0%**
1993	Direct	$374,687	64.3%	25.8%	$95,886	16.5%	55.5%	$23,017	4.0%	44.1%	$88,847	15.3%	40.6%
1993	Indirect	$999,739	84.0%	68.7%	$63,766	5.4%	36.9%	$29,173	2.5%	55.9%	$97,159	8.2%	44.4%
1993	Both	$80,105	63.5%	5.5%	$13,132	10.4%	7.6%	$0	0.0%	0.0%	$32,829	26.0%	15.0%
1994	**Total**	**$1,193,724**	**62.9%**	**100.0%**	**$412,026**	**21.7%**	**100.0%**	**$11,266**	**0.6%**	**100.0%**	**$282,285**	**14.9%**	**100.0%**
1994	Direct	$390,406	65.1%	32.7%	$124,825	20.8%	30.3%	$7,263	1.2%	64.5%	$77,473	12.9%	27.4%
1994	Indirect	$760,658	64.8%	63.7%	$274,986	23.4%	66.7%	$4,003	3.4%	35.5%	$98,757	8.4%	35.0%
1994	Both	$42,660	26.5%	3.6%	$12,215	7.6%	3.0%	$0	0.0%	0.0%	$106,055	65.9%	37.6%

*Other = Canada, Australia, New Zealand, and Israel

Source: BXA *Federal Register* Offset Data

2.2.3.4 Offset Transactions by Type and Region for Direct, Indirect, and Combination: Tables 20 through 22 build upon Tables 15 through 19 by breaking the types of offset transactions into their regional details. Tables 20A and B display data for direct offset transactions in actual values and in terms of the values credited toward offsets. In both cases, subcontractor activity led all other types in total direct offset value for both years, with Europe and Other Areas together claiming disproportionately high shares of the total (close to 100 percent). In actual value, as shown in Table 20A, the Pacific Rim placed more emphasis on purchases, and along with Other Areas accounted for more than 70 percent of the purchase total, even while the two areas combined accounted for less than one third of the value all offset transactions (see Table 19).

Tables 21A and B display data for indirect offset transactions in actual values and in value credited toward offsets. In 1993, purchases alone accounted for 43.5 percent of indirect transactions, and in 1994 purchases accounted for 39.3 percent. In both years, Europe accounted for three-fourths of the purchases. Purchases are seemingly the simplest form of offset to fulfill.

Credit transfer transactions made up the second largest portion of the 1993 world total, with 23.4 percent of indirect offsets. However, in 1994 credit transfers constituted less than one-quarter of one percent of all indirect offsets. That year, technology transfer accounted for almost 25 percent of all indirect offsets, up from 7.7 percent in 1993. The "Other" type were nine percent of the total indirect for both years. "Other" included marketing assistance, maintenance of equipment agreements, rentals, unspecified sales, investment analysis, and other miscellaneous items.

Tables 22A and B show 1993 and 1994 data for combination offset transactions, in actual values and in the value credited toward offsets. For the two-year period, there were a total of 18 combination offset transactions, valued at $287 million. In the period, Other Areas accounted for 48.4 percent of combination offsets, and combination offsets made up 27.7 percent of all transactions for the region. Europe had 42.8 percent of the total actual value of combination offsets, although this category represented only 4.6 percent of their total transactions for the two years.

TABLE 20A: Direct Offset Transactions by Region, 1993 and 1994
Subgrouped by Type
Actual Values in $000s

Year	1993	1993	1993	1993	1993	1994	1994	1994	1994	1994
Region/Type	Europe	Pacific Rim	Middle East	Other Areas	World Total	Europe	Pacific Rim	Middle East	Other Areas	World Total
Number of Transactions	58	29	5	39	131	74	49	4	29	156
Total	374,687	95,886	23,017	88,847	582,437	390,406	124,825	7,263	77,473	599,967
% of World Total	64.33%	16.46%	3.95%	15.25%	100%	65.07%	20.81%	1.21%	12.91%	100%
Purchase	17,009	38,542	18,531	30,612	104,694	25,627	25,472	6,884	35,020	93,003
% of World	16.25%	36.81%	17.70%	29.24%	100%	27.56%	27.39%	7.40%	37.65%	100%
Subcontractor Activity	126,531	1,048	0	50,991	178,570	103,049	3,808	0	39,282	146,139
% of World	70.86%	0.59%	%	28.56%	100%	70.51%	2.61%	%	26.88%	100%
Credit Transfer	0	0	0	0	0	0	0	0	0	0
% of World	%	%	%	%	%	%	%	%	%	0%
Technology Transfer	57,600	4,588	0	2,755	64,943	80,559	30,456	379	3,100	114,494
% of World	88.69%	7.06%	%	4.24%	100%	70.36%	26.60%	0.33%	2.71%	100%
Training	131,773	31,195	0	1,405	164,372	18,123	32,720	0	70	50,913
% of World	80.17%	18.98%	%	0.85%	100%	35.60%	64.27%	%	0.14%	100%
Other	8,944	560	0	84	9,588	43,495	3,107	0	0	46,602
% of World	93.28%	5.84%	%	0.88%	100%	93.33%	6.67%	%	%	100%
Licensed Prod./Assembly	10,281	12,553	0	3,000	25,834	29,855	3,447	0	0	33,302
% of World	39.80%	48.59%	%	11.61%	100%	89.65%	10.35%	%	%	100%
Co-production	22,549	7,400	4,486	0	34,435	85,355	25,815	0	0	111,170
% of World	65.48%	21.49%	13.03%	%	100%	76.78%	23.22%	%	%	100%
Investment	0	0	0	0	0	3,850	0	0	0	3,850
% of World	%	%	%	%	%	10%	%	%	%	100%

Source: BXA *Federal Register* Offset Data

TABLE 20B: Direct Offset Transactions by Region, 1993 and 1994
Subgrouped by Type
Values Credited Toward Offsets in $000s

Year	1993	1993	1993	1993	1993	1994	1994	1994	1994	1994
Region/Type	Europe	Pacific Rim	Middle East	Other	World Total	Europe	Pacific Rim	Middle East	Other	World Total
Number of Transactions	58	29	5	39	131	74	49	4	29	156
Total	420,107	94,381	62,017	106,676	683,182	479,377	164,958	46,253	82,781	773,369
% of World Total	61.49%	13.81%	9.08%	15.61%	100%	61.99%	21.33%	5.98%	10.70%	100%
Purchase	18,070	38,542	57,531	30,612	144,755	26,094	25,522	45,874	35,020	132,511
% of World	12.48%	26.63%	39.74%	21.15%	100%	19.69%	19.26%	34.62%	26.43%	100%
Subcontractor Activity	155,342	1,048	0	50,852	207,242	115,247	3,808	0	39,140	158,195
% of World	74.96%	0.51%	%	24.54%	100%	72.85%	2.41%	%	24.74%	100%
Credit Transfer	0	0	0	0	0	18,639	0	0	0	18,639
% of World	%	%	%	%	%	100%	%	%	%	100%
Technology Transfer	58,100	5,284	0	20,723	84,107	117,677	21,100	379	8,550	147,706
% of World	69.08%	6.28%	%	24.64%	100%	79.67%	14.29%	0.26%	5.79%	100%
Training	146,526	28,274	0	1,405	176,205	20,133	78,493	0	70	98,696
% of World	83.16%	16.05%	%	0.80%	100%	20.40%	79.53%	%	0.07%	100%
Other	9,239	1,280	0	84	10,603	43,632	6,773	0	0	50,405
% of World	87.14%	12.07%	%	0.79%	100%	86.56%	13.44%	%	%	100%
Licensed Prod./Assembly	10,281	12,553	0	3,000	25,834	48,460	3,447	0	0	51,907
% of World	39.80%	48.59%	%	11.61%	100%	93.36%	6.64%	%	%	100%
Co-production	22,549	7,400	4,486	0	34,435	85,645	25,815	0	0	111,460
% of World	65.48%	21.49%	13.03%	%	100%	76.84%	23.16%	%	%	100%
Investment	0	0	0	0	0	3,850	0	0	0	3,850
% of World	%	%	%	%	%	10%	%	%	%	100%

Source: BXA *Federal Register* Offset Data

TABLE 21A: Indirect Offset Transactions by Region, 1993 and 1994
Subgrouped by Type
Actual Values in $000s

Year	1993	1993	1993	1993	1993	1994	1994	1994	1994	1994
Region/Type	Europe	Pacific Rim	Middle East	Other	World Total	Europe	Pacific Rim	Middle East	Other	World Total
Number of Transactions	240	14	10	42	306	291	28	18	62	399
Total	999,739	63,766	29,713	97,159	1,190,378	760,658	274,986	40,027	98,757	1,174,428
% of World Total	83.99%	5.36%	2.50%	8.16%	100%	64.77%	23.41%	3.41%	8.41%	100%
Purchase	389,608	25,876	29,341	73,220	518,045	345,347	34,527	22,894	59,342	462,110
% of World	75.21%	5.00%	5.66%	14.13%	100%	74.73%	7.47%	4.95%	12.84%	100%
Subcontractor Activity	166,502	0	0	12,846	179,348	174,742	0	0	29,417	204,159
% of World	92.84%	%	%	7.16%	100%	85.59%	%	%	14.41%	100%
Credit Transfer	271,721	0	0	6,500	278,221	3,000	0	0	0	3,000
% of World	97.7%	%	%	2.3%	100%	100%	%	%	%	100%
Technology Transfer	57,398	32,390	0	1,343	91,131	83,857	198,185	3,033	0	285,075
% of World	62.98%	35.54%	%	1.47%	100%	29.42%	69.52%	1.06%	%	100%
Training	0	0	372	3,250	3,622	17,975	38,774	250	0	56,999
% of World	%	%	10.27%	89.73%	100%	31.54%	68.03%	0.44%	%	100%
Other	104,752	5,500	0	0	110,252	85,015	3,500	4,487	9,998	103,000
% of World	95.01%	4.99%	%	%	100%	82.54%	3.40%	4.36%	9.71%	100%
Licensed Prod./Assembly	0	0	0	0	0	105	0	0	0	105
% of World	%	%	%	%	%	10%	%	%	%	100%
Co-production	0	0	0	0	0	0	0	725	0	725
% of World	%	%	%	%	%	%	%	10%	%	100%
Investment	9,758	0	0	0	9,758	50,617	0	8,638	0	59,255
% of World	10%	%	%	%	100%	85.42%	%	14.58%	%	100%

Source: BXA *Federal Register* Offset Data

TABLE 21B: Indirect Offset Transactions by Region, 1993 and 1994
Subgrouped by Type
Values Credited Toward Offsets in $000s

Year	1993	1993	1993	1993	1993	1994	1994	1994	1994	1994
Region/Type	Europe	Pacific Rim	Middle East	Other	World Total	Europe	Pacific Rim	Middle East	Other	World Total
Number of Transactions	240	14	10	42	306	291	28	18	62	399
Total	1,185,070	68,266	29,713	117,497	1,400,546	798,910	309,686	63,667	94,813	1,267,076
% of World Total	84.61%	4.87%	2.12%	8.39%	100%	63.05%	24.44%	5.02%	7.48%	100%
Purchase	459,852	24,176	29,341	93,751	607,120	376,155	34,527	37,651	55,398	503,731
% of World	75.74%	3.98%	4.83%	15.44%	100%	74.67%	6.85%	7.47%	11.00%	100%
Subcontractor Activity	239,101	0	0	12,846	251,947	174,742	0	0	29,417	204,159
% of World	94.90%	%	%	5.10%	100%	85.59%	%	%	14.41%	100%
Credit Transfer	298,023	0	0	6,500	304,523	3,000	0	0	0	3,000
% of World	97.9%	%	%	2.1%	100%	100%	%	%	%	100%
Technology Transfer	57,396	32,390	0	1,150	90,936	83,625	198,185	3,033	0	284,843
% of World	63.12%	35.62%	%	1.26%	100%	29.36%	69.58%	1.06%	%	100%
Training	0	6,200	372	3,250	9,822	18,500	73,474	250	0	92,224
% of World	%	63.12%	3.79%	33.09%	100%	20.06%	79.67%	0.27%	%	100%
Other	120,939	5,500	0	0	126,439	86,957	3,500	13,370	9,998	113,825
% of World	95.65%	4.35%	%	%	100%	76.40%	3.07%	11.75%	8.78%	100%
Licensed Prod./Assembly	0	0	0	0	0	105	0	0	0	105
% of World	%	%	%	%	%	10%	%	%	%	100%
Co-production	0	0	0	0	0	0	0	725	0	725
% of World	%	%	%	%	%	%	%	10%	%	100%
Investment	9,758	0	0	0	9,758	55,826	0	8,638	0	64,464
% of World	10%	%	%	%	100%	86.60%	%	13.40%	%	100%

Source: BXA *Federal Register* Offset Data

TABLE 22A: Combination (pt. Direct & Indirect) Offset Transactions by Region, 1993 & 1994
Subgrouped by Type
Actual Values in $000s

Year	1993	1993	1993	1993	1993	1994	1994	1994	1994	1994
Region/Type	Europe	Pacific Rim	Middle East	Other	World Total	Europe	Pacific Rim	Middle East	Other	World Total
Number of Transactions	4	2	0	2	8	5	2	0	3	10
Total	80,105	13,132	0	32,829	126,065	42,660	12,215	0	106,055	160,930
% of World Total	63.54%	10.42%	%	26.04%	100%	26.51%	7.59%	%	65.90%	100%
Purchase	14,500	0	0	28,600	43,100	10,960	198	0	35,430	46,588
% of World	33.64%	%	%	66.36%	100%	23.53%	0.43%	%	76.05%	100%
Subcontractor Activity	18,000	0	0	0	18,000	0	0	0	10,025	10,025
% of World	10%	%	%	%	100%	%	%	%	10%	100%
Credit Transfer	0	0	0	0	0	0	0	0	0	0
% of World	%	%	%	%	%	%	%	%	%	0%
Technology Transfer	23,005	0	0	4,229	27,234	2,400	0	0	60,600	63,000
% of World	84.47%	%	%	15.53%	100%	3.81%	%	%	96.19%	100%
Training	0	0	0	0	0	0	0	0	0	0
% of World	%	%	%	%	%	%	%	%	%	0%
Other	0	0	0	0	0	0	0	0	0	0
% of World	%	%	%	%	%	%	%	%	%	0%
Licensed Prod./Assembly	0	12,017	0	0	12,017	0	12,017	0	0	12,017
% of World	%	10%	%	%	100%	%	10%	%	%	100%
Co-production	0	1,115	0	0	1,115	0	0	0	0	0
% of World	%	10%	%	%	100%	%	%	%	%	0%
Investment	24,600	0	0	0	24,600	29,300	0	0	0	29,300

% of World	10%	%	%	%	100%	10%	%	%	%	100%

Source: BXA *Federal Register* Offset Data

TABLE 22B: Combination (pt. Direct & Indirect) Offset Transactions by Region 1993 & 1994 Subgrouped by Type Values Credited toward Offsets in $000s

Year	1993	1993	1993	1993	1993	1994	1994	1994	1994	1994
Region/Type	Europe	Pacific Rim	Middle East	Other	World Total	Europe	Pacific Rim	Middle East	Other	World Total
Number of Transactions	4	2	0	2	8	5	2	0	3	10
Total	81,332	16,732	0	32,829	130,893	43,560	15,815	0	106,055	165,430
% of World Total	62.14%	12.78%	%	25.08%	100%	26.33%	9.56%	%	64.11%	100%
Purchase	14,500	0	0	28,600	43,100	10,960	198	0	35,430	46,588
% of World	33.64%	%	%	66.36%	100%	23.53%	0.43%	%	76.05%	100%
Subcontractor Activity	18,000	0	0	0	18,000	0	0	0	10,025	10,025
% of World	10%	%	%	%	100%	%	%	%	10%	100%
Credit Transfer	0	0	0	0	0	0	0	0	0	0
% of World	%	%	%	%	%	%	%	%	%	0%
Technology Transfer	24,232	0	0	4,229	28,461	2,700	0	0	60,600	63,300
% of World	85.14%	%	%	14.86%	100%	4.27%	%	%	95.73%	100%
Training	0	0	0	0	0	600	0	0	0	600
% of World	%	%	%	%	%	10%	%	%	%	100%
Other	0	0	0	0	0	0	0	0	0	0
% of World	%	%	%	%	%	%	%	%	%	0%
Licensed Prod./Assembly	0	15,617	0	0	15,617	0	15,617	0	0	15,617
% of World	%	10%	%	%	100%	%	10%	%	%	100%
Co-production	0	1,115	0	0	1,115	0	0	0	0	0
% of World	%	10%	%	%	100%	%	%	%	%	0%

Investment	24,600	0	0	0	24,600	29,300	0	0	0	29,300
% of World	10%	%	%	%	100%	10%	%	%	%	100%

Source: BXA *Federal Register* Offset Data

2.2.3.5 Offsets by Major Industrial Segment: Table 23 presents data for the aerospace/non-aerospace and manufacturing/non-manufacturing industry segments and highlights the role of these segments in offset transactions. For this purpose, aerospace includes some aerospace-dedicated management, educational, service, and component industries such as avionics or instrumentation that are within industry classifications outside the traditional aerospace industry, but are integral to the making or operation and maintenance of aerospace products.

Aerospace-related transactions represented about 51 percent of total value of actual offset transactions, and about 49 percent of the value credited toward offsets. The credited values averaged about 10.7 percent more than the actual transaction values for aerospace classifications, and over 20 percent for non-aerospace classifications. The non-aerospace segment accounted for just under 49 percent of the total actual value and almost 51 percent of the value credited toward offsets. Over 51 percent of the aerospace transactions are direct. In contrast, almost 90 percent of the non-aerospace offset transactions are indirect, and less than 10 percent are direct.

The aerospace segment represented 85 percent of the actual value of all direct offset transactions and 93 percent of combination offsets. However, the non-aerospace segment dominated indirect transactions, with 71 percent of the total value.

In breaking down the same totals in terms of manufacturing/non-manufacturing, it is apparent that manufacturing is dominant, both in terms of the number of transactions and in terms of actual and credited values. Transactions involving manufacturing (885 of 1,010) were 86 percent of the total number. Manufactured items accounted for 84 percent of the value of direct transactions, 86 percent of the value of indirect transactions, and all of the value of combination offset transactions.

TABLE 23: Offset Transactions by Major Industry Segment, Combined 1993-1994 Data (in $000s)

Subgrouped as Direct, Indirect and Combination (Both)

Major Industry Segment	# of Trans.	Actual Value of Offset Transactions			Values Credited Toward Offsets		
		Value in $000s	% of Segment	% of Total	Value in $000s	% of Segment	% of Total
Total - All Segments	1010	$3,834,205	10%	10%	$4,420,495	10%	10%
Aerospace - Total	428	1,960,662	10%	51.14%	2,170,912	10%	49.11%
Aerospace - Direct	228	1,002,418	51.13%	26.14%	1,174,554	54.10%	26.57%
Aerospace - Indirect	184	690,364	35.21%	18.01%	719,150	33.13%	16.27%
Aerospace - Both	16	267,881	13.66%	6.99%	277,208	12.77%	6.27%
Non-Aerospace -Total	582	1,873,543	10%	48.86%	2,249,584	10%	50.89%
Non-Aerospace - Direct	59	179,986	9.61%	4.69%	281,997	12.54%	6.38%
Non-Aerospace - Indirect	521	1,674,441	89.37%	43.67%	1,948,472	86.61%	44.08%
Non-Aerospace - Both	2	19,115	1.02%	0.50%	19,115	0.85%	0.43%
Manufacturing - Total	885	3,301,423	10%	86.10%	3,817,277	10%	86.35%
Manufacturing - Direct	274	989,802	29.98%	25.82%	1,245,804	32.64%	28.18%
Manufacturing - Indirect	593	2,024,625	61.33%	52.80%	2,275,150	59.60%	51.47%
Manufacturing - Both	18	286,996	8.69%	7.49%	296,323	7.76%	6.70%
Non-Manufacturing - Total	125	532,782	10%	13.90%	603,218	10%	13.65%
Non-Manufacturing - Direct	13	192,602	36.15%	5.02%	210,747	34.94%	4.77%
Non-Manufacturing - Indirect	112	340,180	63.85%	8.87%	392,471	65.06%	8.88%
Non-Manufacturing - Both	0	-	-	-	-		-

Source: BXA *Federal Register* Offset Data

Table 24A presents aerospace and non-aerospace offset transactions, both by type and subgrouped by category. Purchases were the leading type of offset transaction for both sectors. Over 99 percent of non-aerospace purchases were indirect, while slightly over 50 percent of aerospace purchases were reported as indirect.

Aerospace transactions led non-aerospace in every direct type category by multiples of two or greater, with the exception of credit transfers. These were very small, at only $434,000. Aerospace transactions comprised 85 percent of total reported direct offsets. The aerospace

sector also dominated technology transfers in every category and comprised over 78 percent of total technology transfers reported.
In comparison to non-aerospace sector transactions, aerospace also leads in training, licensed production/assembly, co-production, and subcontractor activity, although its lead in subcontractor activity is slight. Non-aerospace sector transactions lead aerospace in purchases, investment, and "other", which is comprised of such activities as marketing assistance, sales, and rentals, among others. Non-aerospace transactions also lead in credit transfer, but this may be a one-time anomaly, because of a single unusually large transaction.

Table 24B presents manufacturing and non-manufacturing offset transactions by type and subgrouped by category. The manufacturing transactions reported are extremely dominant in this comparison. The training category is the sole area where non-manufacturing leads manufacturing. Data covering education services (SIC 82) accounts for this anomaly.

The split between direct and indirect offsets is not significantly different for the two segments, although the type breakout is proportionately very different. For example, purchases are one-third for manufacturing, but only one-fifth for non-manufacturing. Subcontracting is about 20 percent for manufacturing and four percent for non-manufacturing. And training is between three and four percent for manufacturing, while one-third for non-manufacturing. The type differences are related to the much higher incidence of purchases and subcontractor activity in the manufacturing sector (57 percent of total), which are not duplicated in the non-manufacturing sector (24 percent). To summarize, while manufacturing is over 86 percent of all offset transactions, it is almost 92 percent of all reported purchases and nearly 97 percent of subcontracting.

TABLE 24A: Offset Transactions by Aerospace and Non-Aerospace Segments, Combined 1993-1994 Data (in $000s)

by Type of Offset

Subgrouped as Direct, Indirect and Combination (Both)

Type Offset	Aerospace						
	Direct		Indirect		Combination		Total
	Value in $000s	% of Total	Value in $000s	% of Total	Value in $000s	% of Total	Value in $000s
Number of Transactions	228	53.27%	184	42.99%	16	3.74%	428
Actual Value	1,002,418	51.13%	690,364	35.21%	267,881	13.66%	1,960,662
Purchase	190,983	33.87%	283,131	50.22%	89,688	15.91%	563,802
Subcontractor Activity	265,171	70.63%	100,257	26.70%	10,025	2.67%	375,454
Credit Transfer	0	%	6,500	??	0	%	6,500
Technology Transfer	155,252	30.78%	258,881	51.33%	90,234	17.89%	504,366
Training	196,270	94.25%	11,971	5.75%	0	%	208,241
Other	37,840	57.13%	28,399	42.87%	0	%	66,239
Licensed Prod./Ass'bly	56,136	70.02%	0	%	24,034	29.98%	80,170
Co-production	96,915	99.26%	725	0.74%	0	%	97,640
Investment	3,850	6.61%	500	0.86%	53,900	92.53%	58,250
Type Offset	Non-Aerospace						
	Direct		Indirect		Combination		Total
	Value in $000s	% of Total	Value in $000s	% of Total	Value in $000s	% of Total	Value in $000s
Number of Transactions	59	10.14%	521	89.52%	2	0.34%	582
Actual Value	179,986	9.61%	1,674,441	89.37%	19,115	1.02%	1,873,543
Purchase	6,714	0.95%	697,024	99.05%	0	%	703,739
Subcontractor Activity	59,538	16.50%	283,250	78.51%	18,000	4.99%	360,788
Credit Transfer	494	0.18%	274,721	99.82%	0	%	275,215
Technology Transfer	24,185	17.09%	117,325	82.91%	0	%	141,510
Training	19,015	28.10%	48,650	71.90%	0	%	67,665
Other	18,350	9.03%	184,853	90.97%	0	%	203,203
Licensed Prod./Ass'bly	3,000	96.62%	105	3.38%	0	%	3,105
Co-production	48,690	97.76%	0	%	1,115	2.24%	49,805
Investment	0	%	68,513	10%	0	%	68,513

Source: BXA *Federal Register* Offset Data

TABLE 24B: Offset Transactions by Manufacturing and Non-Manufacturing Segments, Combined 1993-1994 Data (in $000s)

by Type of Offset

Subgrouped as Direct, Indirect and Combination (Both)

Type Offset	Manufacturing						
	Direct		Indirect		Combination		Total
	Value in $000s	% of Total	Value in $000s	% of Total	Value in $000s	% of Total	Value in $000s
Number of Transactions	274	30.96%	593	67.01%	18	2.03%	885
Actual Value	989,802	29.98%	2,024,625	61.33%	286,996	8.69%	3,301,423
Purchase	194,417	16.75%	876,657	75.52%	89,688	7.73%	1,160,763
Subcontractor Activity	312,053	43.76%	373,024	52.31%	28,025	3.93%	713,103
Credit Transfer	0	%	272,587	10%	0	%	272,587
Technology Transfer	139,431	26.17%	303,047	56.89%	90,234	16.94%	532,711
Training	79,119	71.41%	31,671	28.59%	0	%	110,790
Other	56,190	31.27%	123,479	68.73%	0	%	179,669
Licensed Prod./Ass'bly	59,136	71.01%	105	0.13%	24,034	28.86%	83,275
Co-production	145,605	98.75%	725	0.49%	1,115	0.76%	147,445
Investment	3,850	3.81%	43,330	42.87%	53,900	53.32%	101,080
Type Offset	Non-Manufacturing						
	Direct		Indirect		Combination		Total
	Value in $000s	% of Total	Value in $000s	% of Total	Value in $000s	% of Total	Value in $000s
Number of Transactions	13	10.40%	112	89.60%	0	%	125
Actual Value	192,602	36.15%	340,180	63.85%	0	%	532,782
Purchase	3,280	3.07%	103,498	96.93%	0	%	106,778
Subcontractor Activity	12,656	54.69%	10,483	45.31%	0	%	23,139
Credit Transfer	494	5.41%	8,634	94.59%	0	%	9,128
Technology Transfer	40,006	35.35%	73,159	64.65%	0	%	113,165
Training	136,166	82.47%	28,950	17.53%	0	%	165,116
Other	0	%	89,773	10%	0	%	89,773
Licensed Prod./Ass'bly	0	%	0	%	0	%	0
Co-production	0	%	0	%	0	%	0
Investment	0	%	25,683	10%	0	%	25,683

Source: BXA *Federal Register* Offset Data

2.2.3.6 Offset Transactions by Industry Sectors: Table 25 displays offset transactions identified to 29 two-digit SIC industry sectors that cut across the entire economy. The actual values are shown for direct, indirect, and combination transactions, along with the number of transactions in each category. These 29 sectors were compiled from 127 more detailed industry sectors shown in Table 27.

Table 25 clearly shows the preponderance of sectors 35, 36, and 37, which account for 78.6 percent of the value of all transactions. The transportation equipment sector (37) alone accounts for 54.6 percent of all transactions, and for sub-categories: 65.5 percent of all direct offsets are located in SIC 37 ; 98.1 percent of all combination offsets; and 43.8 percent of all indirect offsets.

Transportation equipment includes about 88 percent of the SIC identified aerospace sector in SIC 372 - Aircraft, Aircraft Engines, and Parts, and SIC 376 - Missiles and Space Vehicles, and Parts. Within transportation, aerospace totals $1,727 million, or about 45 percent of all transactions. Another $234 million in aerospace applications are identified to SICs outside of Transportation (SIC 37).

All 29 sectors have indirect offset transactions represented; direct offsets are shown in nine sectors, and combination offsets appear in only two. Eight of the sectors are represented by only one transaction, in each case indirect. Measuring and analyzing instruments (38), business services (73), and educational services (82) are the only sectors where direct transactions exceed indirect.

Table 26 presents 2-digit SIC sector data by region. Europe is by far the largest and most diversified market with offset transactions in 28 of the 29 major industry sectors. The Pacific Rim has transactions in seven sectors, and is especially focused in the aerospace realm. The Middle East is represented in 12 sectors; transportation equipment is the largest, followed by fabricated metal products. Other Areas have offsets in 10 different 2-digit codes; again, the largest is transportation equipment, followed by electronic/electrical equipment.

Transportation (37) varies by region. For Europe, the sector accounts for 46 percent of the value of all transactions; for the Pacific Rim, the sector constitutes 81.2 percent of offset value; for the Middle East, the sector accounts for 48.4 percent of all offsets; and for Other Areas, the figure is 70.4 percent.

Based on additional data that was received,[8] the aerospace portion of transportation dominated for the Pacific Rim offset arrangements, with 81.2 percent of all of the region's offsets. Aerospace was also an important part of offsets for the Other Areas region, constituting 67.7 percent of the region's total. For Europe, aerospace made up 32.6 percent of all transactions. In addition, Pacific Rim aerospace offset transactions are almost 56 percent indirect, and only 39 percent direct. In contrast, European aerospace transactions are 35 percent indirect and 53 percent direct. This indicates that the Pacific Rim is promoting the development of an aerospace industry utilizing offsets as part of their overall strategy, while the Europeans seem to be maintaining their defense industries.

[8] This information is not shown in greater detail because revealing it could compromise the operations of respondents.

TABLE 25: Offset Transactions by Major Industry Sector, 1993-1994, for Direct, Indirect, and Combination									
SIC Code	Industry Sector	# of Transactions				Actual Values in $000s			
		Total	d	i	b	Total	Direct	Indirect	Both
14	Mining	1	0	1	0	3,244	0	3,244	0
15	General Contractors	2	0	2	0	2,607	0	2,607	0
16	Heavy Construction	1	0	1	0	260	0	260	0
17	Construction - Specialty Trades	1	0	1	0	3,874	0	3,874	0
20	Food and Kindred Products	28	0	28	0	15,466	0	15,466	0
22	Textile Mill Products	1	0	1	0	1,267	0	1,267	0
23	Apparel & Other Finished Products	9	0	9	0	3,518	0	3,518	0
26	Paper Mills and Allied Products	3	0	3	0	8,862	0	8,862	0
27	Printing and Publishing	1	0	1	0	1,761	0	1,761	0
28	Chemicals	22	0	22	0	57,006	0	57,006	0
32	Stone, Clay and Glass Products	4	0	4	0	1,164	0	1,164	0
33	Primary Metal Industries	28	0	28	0	32,871	0	32,871	0
34	Fabricated Metal Products	37	12	25	0	102,676	23,074	79,602	0
35	Industrial Machinery	124	1	123	0	355,130	77	355,053	0
36	Electronic/Electrical Equipment	175	52	121	2	565,616	155,670	404,602	5,344
37	Transportation Equipment	429	200	213	16	2,092,763	774,846	1,036,265	281,652
38	Measuring, Analyzing Instruments	24	9	15	0	63,323	36,135	27,188	0
44	Water Transportation	1	0	1	0	5,208	0	5,208	0
47	Transportation Services	2	0	2	0	2,764	0	2,764	0
50	Wholesale Trade - Durables	12	0	12	0	78,800	0	78,800	0
51	Wholesale Trade - Non-Durables	7	0	7	0	822	0	822	0
61	Nondepository Credit Institutions	4	3	1	0	22,023	2,774	19,249	0
67	Holding/Investment Offices	24	0	24	0	28,488	0	28,488	0
73	Business Services	24	5	19	0	53,224	29,600	23,624	0
76	Miscellaneous Repair Services	1	0	1	0	690	0	690	0
81	Legal Services	1	0	1	0	75	0	75	0
82	Educational Services	12	2	10	0	153,217	117,406	35,811	0
87	Technical Services	23	3	20	0	146,551	42,822	103,729	0
99	Undetermined	9	0	9	0	30,935	0	30,935	0
	All Industries	1010	287	705	18	3,834,205	1,182,404	2,364,805	286,996

Source: BXA *Federal Register* Offset Data

TABLE 26: Offset Transactions by Major Industry Sector, 1993-1994, by Region						
SIC Code	Industry Sector	Actual Values in $000s				
		Total	Europe	Pacific Rim	Middle East	Other
14	Mining	3,244	3,244	0	0	0
15	General Contractors	2,607	2,607	0	0	0
16	Heavy Construction	260	260	0	0	0
17	Construction - Specialty Trades	3,874	3,874	0	0	0
20	Food and Kindred Products	15,466	15,466	0	0	0
22	Textile Mill Products	1,267	1,267	0	0	0
23	Apparel & Other Finished Products	3,518	3,518	0	0	0
26	Paper Mills and Allied Products	8,862	8,862	0	0	0
27	Printing and Publishing	1,761	1,761	0	0	0
28	Chemicals	57,006	42,766	0	9,394	4,846
32	Stone, Clay and Glass Products	1,164	1,164	0	0	0
33	Primary Metal Industries	32,871	18,291	3,191	11,389	0
34	Fabricated Metal Products	102,676	63,840	1,292	17,833	19,711
35	Industrial Machinery	355,130	337,022	10,500	388	7,220
36	Electronic/Electrical Equipment	565,616	416,319	59,239	1,610	88,447
37	Transportation Equipment	2,092,763	1,216,879	474,681	48,380	352,822
38	Measuring, Analyzing Instruments	63,323	44,104	0	400	18,819
44	Water Transportation	5,208	5,208	0	0	0
47	Transportation Services	2,764	2,500	0	0	264
50	Wholesale Trade - Durables	78,800	78,800	0	0	0
51	Wholesale Trade - Non-Durables	822	822	0	0	0
61	Nondepository Credit Institutions	22,023	22,023	0	0	0
67	Holding/Investment Offices	28,488	19,850	0	8,638	0
73	Business Services	53,224	49,992	0	676	2,556
76	Miscellaneous Repair Services	690	690	0	0	0
81	Legal Services	75	0	0	75	0
82	Educational Services	153,217	141,811	7,906	250	3,250
87	Technical Services	146,551	114,380	28,000	987	3,184
99	Undetermined	30,935	30,935	0	0	0
	All Industries	3,834,205	2,648,255	584,810	100,020	501,120

Source: BXA *Federal Register* Offset Data

Table 27 lists all reported industries by SIC code, industry description, and the number of transactions reported for each industry code. In total, 127 industries were identified. The level of specificity by SIC code varies, as this industry data was compiled to the greatest level of detail as provided by industry respondents. In some cases, the data is at the 4-digit industry level. In other cases, however, only the 3-digit or 2-digit levels were obtainable, based on the reported information. For example, some reports simply listed "machinery," which could not be further identified than at the 2-digit SIC code (35 - Industrial Machinery). Therefore, the data does not overlap.

In select cases an item clearly belonged in the aerospace classification, but was reported in a non-aerospace SIC code. These industries were prefaced with the word "Aerospace" in their descriptions. As can be surmised, the determination of SIC codes for each reported transaction was in many cases difficult, in large part because SIC codes were not generally reported. The resulting large number in basket category 2- and 3-digit listings, therefore, significantly understates the total range of 4-digit SICs that were actually involved in these offset transactions.

Table 27: Offset Transactions Detailed Listing of Industry Sectors, SIC Codes 14-99						
SIC Code	**Industry Description**	**#**		**SIC Code**	**Industry Description**	**#**
14	Mining	1		3444	Sheet Metal Work	4
1521	General Contractors, Family Houses	1		3452	Industrial Fasteners	1
1541	General Contractors, Industrial	1		3462	Iron and Steel Forgings	7
16	Heavy Construction	1		3463	Aerospace (Nonferrous Forgings)	1
1761	Roofing, Siding, & Sheet Metal Wk	1		3479	Coating, Engraving, & Allied Serv.	1
20	Food and Kindred Products	14		348	Ordnance & Accessories (Launcher)	1
2033	Canned Fruits and Vegetables	2		348	Ordnance & Accessories (Services)	1
2079	Shortening and Oils	3		348	Ordnance and Accessories	9
2084	Wine, Brandy, and Brandy Spirits	9		3489	Ordnance and Accessories, NEC	3
22	Textile Mill Products	1		349	Valves	1
23	Apparel & Other Finished Products	9		3499	Metal Fabrication, NEC	1
2621	Paper Mills	2		35	Industrial Machinery	47
2671	Packaging Paper	1		3519	Internal Combustion Engines	2
27	Printing	1		3523	Farm Machinery	1
28	Chemicals and Allied Products	14		3531	Construction Machinery	1
28	Petrochemicals	2		3532	Mining Machinery	6
282	Plastics	1		3535	Conveyors and Conveying Eqmt.	2
2834	Pharmaceutical Preparations	1		3541	Metal Cutting Machine Tools	16
286	Industrial Chemicals	1		3542	Metal Forming Machine Tools	5
2865	Cyclic Organic, Crude/Intermediate	1		3544	Special Dies and Tooling	4
2892	Explosives	1		3548	Welding Equipment	2
2895	Carbon Black	1		3552	Textile Machinery	2
3281	Cut Stone and Stone Products	4		3553	Woodworking Machinery	2
33	Primary Metal Industries	5		3554	Paper Industries Machinery	4
3312	Steel Works	5		3555	Printing Trades Machinery	2
3315	Steel Wiredrawing	1		3562	Ball and Roller Bearings	1
332	Iron and Steel Foundries	2		3567	Industrial Furnaces & Ovens	1
3334	Primary Aluminum	6		3569	General Industrial Machinery	4
3339	Primary Metal, exc. Alum. & Copper	3		357	Computer Hardware	18
3351	Copper Drawing and Extruding	6		3577	Computer Printers	1
34	Fabricated Metal (Containers)	2		3589	Service Industry Machinery	1
34	Fabricated Metal Products	2		3599	Other Industrial Eqmt. (Filters)	2
3443	Fabricated Plate Work	3		36	Electronic & Other Electrical Eqmt	6

Source: BXA *Federal Register* Offset Data

Table 27 (continued): Offset Transactions
Detailed Listing of Industry Sectors, SIC Codes 14-99

SIC Code	Industry Description	#	SIC Code	Industry Description	#
3621	Electric Motors and Generators	1	50	Wholesale Trade - Durables	2
3625	Relays and Industrial Controls	1	5047	Wholesale Trade - Medical Eqmt	2
3632	Household Refrigerators	2	5051	Wholesale Trade - Metals	7
366	Aerospace (Telecommunications Eq.)	4	5084	Wholesale Trade - Ind. Machinery	1
366	Telecommunications Equipment	21	5122	Wholesale Trade - Pharmaceuticals	2
3661	Telephone Systems	3	5169	Wholesale Trade - Chemicals	5
3669	Other Communications Equipment	1	61	Banked Credit	4
367	Aerospace (Electronics)	11	67	Holding/Investment Offices	21
367	Electronics	122	672	Investment Offices	1
3672	Electronic Circuit Boards	1	6799	Venture Capital	2
3674	Semiconductors and Related Devices	1	73	Business Services	1
369	Batteries	1	737	Aerospace (Software and Data Proc)	5
371	Automotive	6	737	Software and Data Processing	17
3711	Automotive	1	7389	Other Business Services	1
3714	Motor Vehicle Parts & Accessories	13	769	Miscellaneous Repair Shops	1
372	Aerospace (Aircraft and Parts)	314	8111	Legal Services	1
3721	Aerospace (Aircraft)	3	82	Aerospace (Educational Services)	2
3724	Aerospace (Aircraft Engines & Pts)	5	82	Educational Services	9
3728	Aerospace (Aircraft Parts)	75	8221	College and University Education	1
3731	Ship Building and Repairing	11	8711	Aerospace (Engineering Services)	1
376	Aerospace (Missiles & Space Vehs)	1	8711	Engineering Services	1
38	Instrumentation (Test Equipment)	1	8731	Commercial Research, Physical Sci.	7
3812	Aerospace (Navigation Equipment)	3	8732	Commercial Research, Social Sci.	1
3812	Search and Navigation Equipment	3	8741	Management Services (Admin.)	1
3823	Industrial Process Controllers	1	8742	Aerospace (Management Consulting)	1
3827	Aerospace (Optical Instruments)	2	8742	Management Consulting Services	10
384	Medical Instruments and Equipment	6	8748	Business Consulting, Other	1
3841	Surgical Instruments	1	99	Undetermined	9
3842	Medical Equipment and Supplies	5			
3844	X-Ray Equipment	2			
4412	Ocean Freight Shipping	1			
47	Transportation Services	1			
472	Tourist Transportation Services	1			

Source: BXA *Federal Register* Offset Data

3. Defense Diversification & Competitive Enhancement Needs Assessment

BXA is involved in a number of defense diversification activities designed to maintain and enhance the U.S. defense subcontractor base. One tool used by BXA to provide assistance is the Competitive Enhancement and Defense Diversification Needs Assessment Survey (OMB Control Number 0694-0083). This voluntary survey is directed toward small and medium sized businesses, and seeks to match the defense conversion and competitive enhancement needs of these firms with assistance programs available through the federal and state governments. It has been mailed to subcontractors of U.S. defense prime contractors around the country. The survey gathers basic information about the firms' operations, including sales, employment, and exports. In addition, BXA included a multi-part question on offsets in defense trade:

1. *Has your firm been involved in an offset agreement?*

2. *Has your firm been negatively affected by offset agreement practices? (For example: have you ever lost a sale because of an offset agreement, or have new competitors been created due to offset agreements)*

3. *Has your firm been positively affected by offset agreements?*

Respondents were asked to comment if they responded positively to any of these questions. The responses to the question provide the subcontractors' perspective on the issue, both positive and negative, complementing the offset information received from the defense prime contractors in response to the December 1994 Department of Commerce *Federal Register* notice (see Section 1.1, Legislation, in Chapter 1). The DPA Section 309(b)(1)(A) and (2) allows for the inclusion of offset data gathered from other studies, as well as recommends analysis of the affects of offsets on lower tier subcontractors.

The total number of respondents to the BXA Needs Assessment survey was 1,153 firms nationwide. On average, these 1,153 firms reported 180 employees, classifying them as small firms under the Small Business Administration's definition. These firms also reported an average of 31 percent of sales going to defense endmarkets.

Of the total number of respondents, 976, or 85 percent, of them responded to the question of *involvement* in offset arrangements. Breaking down the respondents further, of the 976

responding, 152, or 16 percent, said they were involved in these arrangements, while the remaining 824 were not.

Of the 976 who responded to the question of involvement, 204 reported either a positive or negative *impact of offsets*. This figure is higher than the number for firms *involved* in offsets; firms could be positively or negatively impacted by offsets without being directly involved in these arrangements. Of the 204, 34, or 17 percent, reported that they were positively affected by offsets, while 170, or 83 percent, indicated that they were negatively impacted by offsets.

3.1 Company Comments on Offsets

Listed below are comments received from the Defense Diversification Needs Assessment Survey respondents regarding offset arrangements and represent firms in the aircraft and parts, electronic components, fabricated metal products, metal working machinery and equipment, and numerous other industry sectors. They have been divided into categories according to the nature of their responses. While this information is only anecdotal, it provides a perspective on the impact of offset agreements on the subcontractor base.

The first group of responses are from those who commented negatively on offset arrangements. The majority of those respondents to the Defense Diversification Needs Assessment Survey who provided comments mentioned that they had lost business due to these arrangements:

> A world-class aerospace and naval forging manufacturer in the midwest stated that they had "lost significant amounts of work due to prime contractors utilizing foreign sources to satisfy offset requirements."
>
> A northeastern precision aerospace machine shop reported, "We've lost 20 percent of our business to mandated offset agreements. In the future this will grow substantially. This is our number one problem."
>
> A manufacturer of rolled rings for aerospace applications stated, "Our company has been significantly affected by [prime engine contractor's] offset agreements to Asia and Europe. I estimate that our company has lost more than 50 percent of our business due to offset agreements."
>
> A western distributor of optical materials for a wide range of commercial and defense end uses said, "[Offsets have] occurred on military equipment used by NATO countries; production goes to European countries for U.S. hardware. It also seems that optics are sourced offshore for defense applications which has a negative impact on U.S. industry."

> A west coast machine shop reported, "We've lost processing work on the jobs that went overseas as a result of aircraft and military hardware sales." Another aerospace machine shop stated, "[The aerospace prime contractor we supply] participates in an offset program which seems to have introduced increased competition and possible lost orders to American manufacturers."

Other firms commenting on offset agreements and their impact reported that new foreign competitors had been created through technology transfer resulting from offset agreements.

> A world-class aerospace and naval forging manufacturer in the midwest stated that "prime contractors had transferred technology developed domestically to offshore suppliers in offset agreements."
>
> A west coast composite material firm noted that the aircraft primes "have introduced foreign companies to [U.S.] composite fabrication techniques." These firms are now competitors to the company for both U.S. and foreign business.
>
> A midwest company that designs and manufactures pumps and valves for aircraft applications reported, "New competitors created as a result of offsets. Foreign countries now designing indigenous aircraft using this technology."
>
> A western producer of castings for commercial, aerospace and defense industries reported, "New competitors were created or strengthened due to an offset program, hence, we lost the contracts."

A few companies reported that they had refused to transfer technology in cooperation with an offset agreement:

> A defense aircraft lighting systems company in the southwest refused to participate in offsets and lost business: "Offset agreement would have meant the loss of some proprietary techniques."
>
> An east coast producer of communication equipment said, "We've lost a sale to a French Government customer who insisted that we work with a French company to manufacture a product developed by us."

Some firms reported that, because of offset agreements, they had been forced to change suppliers or consider opening new facilities overseas:

> A midwestern precision machine shop supplying the aerospace, medical, and computer markets stated, "We have aided a customer's offset requirements by purchasing castings overseas and then supplying completed machined parts ready for assembly."

A semiconductor material manufacturer on the west coast reported, “We have made plans to increase investment in Japan and Korea in order to meet pressures to be more active in these countries. Korea is more overt in suggesting the need for on-shore investment.”

Finally, some firms reported incidents where offset agreements had raised overall program costs:

A manufacturer of microwave components and circuits stated that “offset agreements by the prime contractors involving ... microwave products almost never work because of the complexity of the products.” The firm noted that often they have to become involved again later in the process to make the product work, adding to the overall cost of the system.

A manufacturer of precision parts for aircraft engines reported that “domestic suppliers of precision engine parts have been devastated by offsets because engine prime contractors have been using offshore suppliers to fulfill offsets.” They added, “The domestic supplier base is evaporating.” Ironically, the company added that they now sell worldwide to the very suppliers who displaced them in the offset agreement.

Other respondents provided positive comments on offset agreements. Many indicated that offset agreements had resulted in maintained or increased sales.

A midwest company that designs and manufactures pumps and valves for aircraft applications reported, “[Offsets] kept mature program in production, profit margin generally quite favorable.”

A New England producer of communications products stated, “Due to the offset arrangement, our firm received development funds which were used to launch a new family of products.”

A midwestern producer of precision aerospace parts reported that the firm had received business from foreign companies that were supposed to perform offset work because the foreign firms were unable to fulfill the agreement.

A western materials firm commented that offsets had resulted in “sales to foreign companies” of advanced composite materials.

Another materials firm based in California provides service to firms that had required a composite offset and has gained new markets as a result.
A midwest distributor of packing materials assists his prime contractor by doing business with companies in the countries his prime is selling into; the distributor’s purchases result in offset credits for the prime.

A western producer of cable products indicated that the firm was able to enter the market in Greece as a result of an offset agreement.

A midwest company providing service to the machine tool industry reported that offset agreements had allowed them to team up with other firms to enter new markets overseas.

Finally, some firms reported that, while they had to give up something in the offset process, in return they had gained market share. Of those responding, many had given up previous-generation technology or some production, or had been forced to modify their own procurement habits in exchange for increased sales of their own products.

4. U.S. Government Policy on Offsets

4.1 The 1990 U.S. Government Policy on Offsets in Military Exports

The U.S. Government Policy on Offsets in Military Exports is the only current public U.S. policy on the issue. This policy is a result of the National Defense Authorization Act for Fiscal Year 1989,[9] which required the President to establish a comprehensive defense trade offset policy. The policy notes that the U.S. Government views certain offsets to be economically inefficient and market distorting. The policy directs that certain principles should be followed to minimize the adverse effects of offsets, while not hampering U.S. firms' ability to compete for military export sales. This policy was issued on April 16, 1990, by the White House Press Secretary in the following statement:

> "The President announced today his policy on Offsets in Military Exports. This responds to the requirement under FY 1989 National Defense Authorization Act, Section 825, 10 U.S.C. Sec. 2505.
>
> "The President stated that the United States Government is committed to the principles of free and fair trade. Consequently, the United States Government views certain offsets for military exports as economically inefficient and market distorting.
>
> "Mindful of the need to minimize the adverse effects of offsets in military exports, while ensuring that the ability of U.S. firms to compete for military export sales is not undermined, the President has established the following policy:
>
> -- No agency of the U.S. Government shall encourage, enter directly into, or commit U.S. firms to any offset arrangement in connection with the sale of defense goods or services to foreign governments.
>
> -- U.S. Government funds shall not be used to finance offsets in security assistance transactions except in accordance with currently established policies and procedures.

[9] Pub. Law No. 100-456, Section 825; 10 U.S.C. 2505 (subsequently renumbered as 10 U.S.C. 2532 by Pub. Law No. 102-585).

-- Nothing in this policy shall prevent agencies of the U.S. Government from fulfilling obligations incurred through international agreements entered into prior to the issuance of this policy.

-- The decision whether to engage in offsets, and the responsibility for the negotiating and implementing offset arrangements, resides with the companies involved.

-- Any exceptions to this policy must be approved by the President through the National Security Council.

"The President also noted that the time has come to consult with our friends and allies regarding the use of offsets in defense procurement. He has, therefore, directed the Secretary of Defense, in coordination with the Secretary of State, to lead an interagency team to consult with foreign nations with a view to limiting the adverse effects of offsets on defense procurement. This interagency team will report periodically on the results of these consultations and forward any recommendations to the National Security Council."

It was envisioned that the interagency team would include the Departments of Commerce, Labor, Treasury, OMB, and the Office of the U.S. Trade Representative. The Congress subsequently incorporated this policy statement into law with an amendment to the National Defense Authorization Act (Pub. L. 102-558, Title I, § 124, 106 Stat. 4207).

4.2 The NATO Code of Conduct in Defense Trade

For a two year period (1992-1993) extensive meetings took place at NATO and in member capitals to establish a generic "ground rules" document to initiate a defense trade discussion at NATO among the allies. The draft "NATO Code of Conduct in Defense Trade" was to define the "Principles for Improving Defense Trade Among the Allies" including transparency of national procurements, contracting and auditing procedures, quality control, technology transfer, re-export requirements and removal of barriers to defense trade.

The following statement was included in the draft Code of Conduct regarding offsets:

"Offsets constitute an integral part of the industrial policy of certain countries. Nevertheless, those countries will progressively reduce, towards timely elimination, their offset requirements, once they have noted real progress in the opening up of markets, in the transfer of technology, and in the participation in common research, development and production programmes. This process towards elimination will be reciprocal, and will

> take into account the different approaches to defense trade among the members of the Alliance."

In late 1993 an agreement to formally approve the Code of Conduct and move into the implementation phase failed. Although offset language alone was not the reason for the failure to reach final agreement, it did remain an issue of debate until the discussions were suspended. Even the rather expansive statement of principle regarding gradual elimination of offsets was viewed by some nations as posing serious difficulties, while the U.S. saw this language as providing inadequate discipline on offsets. Further discussion of offsets within NATO were consequently never agreed on among the allies.

5. Findings/Recommendations

The costs and benefits of offsets in defense trade have been long debated within the U.S. Government. At issue is the adverse impact that offsets may have on the U.S. employment, industrial, and technology base versus the benefits of increased export levels in a competitive buyers'-market business climate, the creation of export-related jobs, and additional sales of U.S. spares and services over the life time of the exported hardware.

Because of the superiority of U.S. technology and weapon systems, U.S. defense companies usually have an advantage over foreign companies in terms of the types of direct and indirect offsets they can provide. However, this superiority presents a double-edged sword. As the world's preeminent supplier of weapons (over 45 percent market share) and high-cost/high-technology hardware, U.S. corporations are also highly vulnerable to offset demands. Their traditional consent to such impositions is a sign of competitive pressures.

The Administration, based on previous studies as well as the current study, continues to be concerned that defense offset practices may be detrimental to the nation's defense industrial base, particularly to small- and medium-sized defense subcontractors. Defense offsets may create or enhance foreign competitors, exacerbate already excessive defense production capacity, displace U.S. firms, and reduce U.S. employment. In fact, the great majority of offset demands are from economies with major commercial competitors of U.S. firms, including Canada, Japan, and most Western European nations. Further, the use of offsets in defense trade has expanded in recent years to additional countries. Moreover, with the apparent increase in the use of indirect offsets, more industries, many not related to defense, may be affected.

In the post-Cold War environment, defense offsets are being used primarily as a tool to achieve economic policy goals. Developed countries with established defense industries are using offsets to channel work or technology to their domestic defense or aerospace companies. Countries with newly industrialized economies are utilizing both military and commercial related offsets that involve the transfer of technology and know-how. The developing countries with less industrialized economies generally pursue indirect offsets to help create profitable commercial businesses and build their infrastructure. All Organization for Economic Cooperation and Development (OECD) countries engage in military offsets. Many emerging markets have offset programs linked to government procurement which either affect designated sectors (e.g., Brazil, South Korea, and Taiwan) or are triggered by the size of the procurement (e.g., Indonesia and the United Arab Emirates).

Findings:

Based on BXA 1993-1994 data collection, the following findings are apparent:

1. The average level of offsets in defense trade required by most countries appears to be about the same between the 1980-1987 OMB data and the 1993-1994 BXA data. The average for all countries represented in the OMB data was about 57.2 percent. The average for the BXA data was 54.8 percent (excluding two unusually large sales). The BXA data indicates that several countries (Taiwan, Malaysia, Kuwait, and UAE) have developed new offset policies and now require offsets as a condition of sales contracts. According to BXA and original OMB data as well as the recently released General Accounting Office report ("Military Exports: Offset Demands Continue to Grow"), the level of offsets countries apply tend to increase with time and experience.

2. Indirect defense offsets relative to direct defense offsets are substantially higher than they were in the 1980s. This is based on a comparison of OMB's new agreements data for 1980-1987, which reported indirect at about 53 percent (excluding unknown), and BXA's transactions data which indicates indirect are about 67 percent (excluding unknown). The fact that worldwide defense exports are down may underlie the shift toward indirect, and may further reduce demands for direct offsets in the future. About three-fourths of the offsets were comprised of purchases, subcontracting activity, and technology transfer, all of which provide support for local business. It was also noted that the Pacific Rim countries were highly focused in indirect aerospace offsets.

3. With the rise of indirect defense offsets, a broader band of industries is now affected by offsets. Based on OMB billings data (Table 4), over 68 percent of offsets were aerospace related (SIC 372 & 376) compared to just over 45 percent (within SIC 37) for the BXA data. There also appears to be a noticeable increase in non-manufacturing offsets, which were negligible for the OMB data, but are nearly 14 percent in the BXA data.

4. European new offset agreements and offset transactions with the United States as a partner have declined, tracking the decline in defense trade. This is probably closely related to the collapse of the Soviet Union, lowered defense budgets, the

European recession, national budget constraints, and more intra-European offset partnering. However, upcoming European and NATO procurements indicate a significant offset requirement and could reverse this trend.

Recommendations:

1. Implement consultations with major U.S. arms producers, both primes and subcontractors, and with labor to gather representative views on minimizing the adverse effects of offsets in defense trade.

2. Consult with our trading partners on offsets in defense trade and related military procurement issues.

3. Review and modify as necessary current U.S. Government policy on offsets in defense trade to respond to the changing nature of offset demands, reflecting both the need for U.S. firms to remain competitive in international arms markets and the need to maintain our defense industrial base. The United States should be cautious in making any decision to unilaterally limit offsets.

Appendices

A. Section 309 - Defense Production Act of 1950, as amended

B. April 26, 1994 Proposed Rule - Offsets in Military Exports

C. December 2, 1994 Final Rule - Offsets in Military Exports

D. U.S. DOC Offset Report Format for 1993-1994

Appendix A

Section 309
Defense Production Act,
As Amended

Appendix B

April 26, 1994 Proposed Rule
Offsets in Military Exports

Appendix C

December 2, 1994 Final Rule
Offsets in Military Exports

Appendix D

U.S. DOC Offset Report Format for 1993-1994

OFFSETS IN DEFENSE TRADE

A Study Conducted under Section 309 of the Defense Production Act of 1950, As Amended

Prepared By
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OFFSETS IN DEFENSE TRADE

EXECUTIVE SUMMARY

This is the second report on offsets in defense trade prepared by the Department of Commerce's Bureau of Export Administration (BXA), as authorized under the 1992 amendments to Section 309 of the Defense Production Act of 1950, as amended. The report includes data on both new offset agreements struck in 1995, and transactions completed to fulfill agreements made in previous years. The same data is also provided for the years 1993-1994 to put the new numbers in perspective and highlight trends.

* * * * *

In 1995, U.S. prime contractors entered into 45 new offset agreements valued at over $6 billion. The defense export contracts which these agreements facilitated were worth $7.4 billion. This represented a substantial increase in new obligations over previous years, both in value and as a percentage of export contracts. European governments demanded by far the largest portion of offsets at $5.2 billion, or 86 percent of the value of all new U.S. offset agreements. New agreements made with this region rose to 104.3 percent of the value of defense export contracts. A total of 21 of the 26 new offset agreements entered into with Europe were for 100 percent or more. With the removal of one country's new agreements, the European average declines to 96.2 percent.

The decrease in defense budgets, large national debts, and significant unemployment which plague Europe appear to be driving increased offset demands in that region. Such figures are also a symptom of the increasingly competitive international arms market, where the buyer wields a great deal of leverage. In addition, major declines in U.S. defense procurement of aircraft in recent years have placed U.S. aerospace companies in a position of greater reliance on international sales for their revenues. Consequently, the importance of offsets as a marketing tool has apparently increased in the current environment.

Prime contractors reported a total of 671 offset transactions in 1995 valued at $2.7 billion. This figure represented an increase over previous years as well. Europe was the major demander of these transactions, receiving over 70 percent of the value of transactions. About 40 percent were direct offsets (related to the exported defense system), which is somewhat higher than the previous two years, but not a significant reversal of the general trend toward more indirect

offsets. Over 75 percent of 1995 transactions were comprised of purchases, subcontracting, and credit transfers. The transfer of technology accounted for another eight percent. The same categories composed slightly less of the total in 1993-1994.

Among the beneficiaries of offset transactions were 738 different public and private foreign organizations. The great majority were private firms. Most were involved in only one or two transactions, though one firm received 35 offsets valued at $216 million. The entity which gained the greatest value received 16 transactions worth $248 million, or 3.8 percent of the total. Foreign public concerns to whom offsets were transferred included defense ministries, individual branches of the armed forces, and other entities such as ministries of economic affairs, research institutes, and industrial development agencies.

According to the surveyed prime contractors' 1995 offset transaction reports, over 90 percent of existing offset agreements arose from the export of aerospace systems. However, only 50 percent of offset transactions were aerospace-related. The balance cut a wide cross section across the rest of the economy. This supports the contention made last year that indirect offsets are increasing both in volume and in scope.

The goods and services used to fulfill existing offset obligations 1993-1995 were distributed among 172 industrial sectors, with 45 new sectors added in the final year of the survey. Nearly 81 percent of the offsets were manufactured products, especially concentrated in certain sectors. The broadly defined transportation equipment sector comprised almost 51 percent of the value of all offset transactions. Another 13 percent involved electrical machinery and equipment, and 10 percent were non-electrical machinery. These three manufacturing sectors accounted for nearly 75 percent of transactions. Within the transportation equipment sector, aircraft and parts comprised 43 percent of total transactions, and commercial shipbuilding and repair, five percent. In the service sector, bank credit accounted for six percent of offset transactions.

The impact of offsets upon three specific industries was analyzed: machine tools, commercial shipbuilding, and gears. Viewed from an industry-wide perspective, the immediate impact appeared small in absolute dollar values. However, there can be some indirect impacts of offsets. For example, foreign suppliers are strengthened and introduced to new customers. At the level of the individual company, the impact of offsets may also be significant. Offsets can also cause purchasing decisions to be based on contractual criteria, where specific suppliers must be identified in buyer countries to meet the offset demands. As a result, U.S. firms lose work to foreign companies when production is transferred overseas. These circumstances are evident in

the machine tool and gear industries.

Based on separate information collected by BXA, 114 U.S. defense subcontractors (out of a population of 703) reported being directly involved or impacted by offsets. Almost 80 percent of the 114 respondents stated that the impact was negative. Additional analysis of the data indicated that larger subcontractors with higher defense market shares were more likely to report any impacts. The 20 percent that reported being positively impacted by offsets were primarily the largest firms, while smaller firms were more likely to report negative impacts.

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1. OVERVIEW

1.1 Legislation

In 1984 Congress enacted amendments to the Defense Production Act of 1950, as amended, which included the addition of Section 309. This new section required the President to submit annually to the Committee on Banking, Finance, and Urban Affairs of the House of Representatives and the Committee on Banking, Housing, and Urban Affairs of the Senate a report on the impact of offsets on the defense preparedness, industrial competitiveness, employment, and trade of the United States. Additional minor modifications to Section 309 have been made in subsequent years by the Congress.

When Section 309 was first enacted, the Office of Management and Budget (OMB) was appointed as the interagency coordinator in the preparation of the annual offsets report for the Congress. These reports were to be prepared in consultation with the Departments of Commerce, Defense, and Labor, and the Office of the United States Trade Representative. This interagency reporting requirement continued, with minor adjustments, until 1992, when Section 309 underwent major modifications. The interagency coordination role was transferred from OMB to the Secretary of Commerce. In addition, the Secretary was given authority to develop and administer regulations to collect from industry the offset data required for the report. This responsibility was later delegated to the Department's Bureau of Export Administration (BXA). A change was also made in Section 309, adding a sales reporting threshold previously cited in the National Defense Authorization Act for fiscal year 1991. The offset agreement threshold was reduced from $50 million to $5 million for U.S. firms entering into foreign defense sales contracts subject to offset agreements. On a per-transaction level, firms must report all offset transactions for which they receive offset credits of $250,000 or more. A copy of Section 309 can be found in *Appendix A*. An itemized list of information that is collected annually from industry is located in *Appendix B*.

1.2 Background

Offsets are industrial compensation practices mandated by many foreign governments when purchasing defense articles. Definitions of offsets used by industry and government are sometimes inconsistent. Most parties, however, use the following definition which was

developed by a U.S. Government interagency group in 1986: offsets are industrial compensation practices required as a condition of purchase in either government-to-government or commercial sales of defense articles and/or defense services as specified in the International Traffic in Arms Regulations. In defense trade, offsets include mandatory co-production, licensed production, subcontractor production, technology transfer, countertrade, and foreign investment. Offsets may be direct, indirect, or a combination of both. Direct offsets refer to compensation, such as co-production or subcontracting, "directly" related to the system being exported. Indirect offsets apply to compensation unrelated to the exported item, such as foreign investment or countertrade.

Countries require offsets for a variety of reasons: to ease (or "offset") the burden of large defense purchases on their economy; to increase or preserve domestic employment; to obtain desired technology; and to promote targeted industrial sectors. In extensive discussions with BXA, U.S. prime contractors reported that defense exporters often must fulfill these demands or risk losing a valuable sale. Moreover, industry informed BXA that, in most cases, defense exporters cannot even submit a bid proposal without including an offset package.

Since World War II, U.S. defense industries have been major players in the international arms market. Co-production/licensed production in defense trade were initially encouraged by the U.S. Government to help rebuild the war-ravaged economies and industrial bases of Western Europe and Japan. Co-production/licensed production of U.S. weapon systems in foreign countries began in the late 1950s and early 1960s. The NATO countries and Japan were the first to enter into such agreements with the United States.

During the Cold War, it was in the best interests of the U.S. to ensure that allied countries were strong militarily as well as economically. Historically, offsets have served important foreign policy and national security objectives of the United States, such as increasing the industrial capabilities of allied countries, standardizing military equipment, and modernizing allied forces. The use of offsets is now commonplace. Today, virtually all U.S. defense trading partners impose some type of offset requirement, and at times the stated value of the offset exceeds that of the sales contract.

The type of offsets that buyer countries demand is changing as many countries face decreasing security threats and excess capacity in their arms industries. Foreign governments typically use direct offsets involving co-production to justify expensive arms purchases, claiming that the purchase will boost local employment and national security by helping to maintain domestic defense industries.

Increased competition for a declining number of international arms contracts and weak domestic defense markets should continue to foster offset agreements. U.S. technology and weapon systems, notably aerospace, are some of the best available on the world market, and the U.S. economy is the largest and most diverse. These factors confer general competitive advantages on U.S. defense firms over foreign concerns in the range of direct and indirect offsets they can provide.

While offsets are used as a "marketing tool" by arms exporters, buying governments now have greater market leverage and expanded choice. In cases where buyers recognize that the costs outweigh the benefits of a particular direct offset, industry noted that the buyers are more than likely to emphasize indirect offsets rather than stop demanding them altogether. Many buyer countries now prefer indirect offsets as a means to promote economic development, to diversify arms industries, or to improve their balance of trade. The BXA offset data for 1993-95 illustrates this trend overall, with some variation by industry and region.

The *Offsets in Military Exports* reports prepared by OMB from 1985 to 1990 highlighted a growing trend in offset demands by purchasing countries around the world, both for direct offsets (related to the weapon sale) and indirect offsets (not related to the sale). Indirect offset demands have expanded dramatically beyond defense/aerospace to affect other industries such as automobiles, semiconductors, software, and telecommunications. Last year's Department of Commerce report found that one-third of the offsets were direct (related to the weapon systems sold) and two-thirds were indirect (not related to the weapon systems sold); three-fourths of total offsets (direct and indirect) involved the purchase or subcontracting of goods and services or the transfer of technology. This year's report indicates that direct were 39.8 percent of the total and 60.2 percent were indirect. Almost 70 percent of total offsets involved the purchase or contracting of goods and services or the transfer of technology.

In the 1993-95 data shown in section 2 of this report, 172 different industries are affected by direct and indirect offsets, an increase of 45 over the 1993-94 data presented last year. However, the data remains heavily clustered in aerospace and related areas.

From an industry perspective, most companies would prefer to compete on the basis of quality and price of their primary product, rather than participate in offset agreements. In general, U.S. defense firms are not in the consulting, technology transfer, risk capital, or trading business. However, because of foreign government demands, offsets have become a recognized part of doing business with customers, and U.S. defense firms are responding to these demands.

Offsets are a viable method for foreign governments to advance national economic goals and are part of almost every military export transaction. U.S. companies would be pleased to see the disappearance of most offset requirements, particularly direct offsets that impact their supplier infrastructure. However, offsets provide a marketing advantage to U.S. firms. As the U.S. has the world's largest economy, it can be argued that the U.S. can absorb offset requirements, including some purchases from the customer country, with less of an impact on the overall economy, more readily than competitor countries. This marketing advantage is particularly important to the U.S. defense industry given the absence of U.S. government subsidies for defense products.

A list of other offsets reports, including those published by OMB, is included in *Appendix C*.

1.3 Offsets Definitions

Listed below are offset definitions as outlined in the *Federal Register* (Vol. 59, No. 231) dated December 2, 1994, prepared by BXA (codified at 15 CFR Part 701); and *Offsets in Military Exports*, OMB, dated December 1988.

Offsets: Industrial compensation practices required as a condition of purchase in either government-to-government or commercial sales of defense articles and/or defense services as defined by the Arms Export Control Act and the International Traffic in Arms Regulations.

Military Export Sales: Exports that are either Foreign Military Sales (FMS) or commercial (direct) sales of defense articles and/or defense services as defined by the Arms Export Control Act and International Traffic in Arms Regulations.

Direct Offsets: Contractual arrangements that involve defense articles and services referenced in the sales agreement for military exports.

Indirect Offsets: Contractual arrangements that involve goods and services unrelated to the exports referenced in the sales agreement.

Co-production: Overseas production based upon government-to-government agreement that permits a foreign government(s) or producer(s) to acquire the technical information to manufacture all or part of a U.S. origin defense article. It includes government-to-government licensed production. It excludes licensed production based upon direct commercial arrangements

by U.S. manufacturers.

Licensed Production: Overseas production of a U.S. origin defense article based upon transfer of technical information under direct commercial arrangements between a U.S. manufacturer and a foreign government or producer.

Subcontractor Production: Overseas production of a part or component of a U.S. origin defense article. The subcontract does not necessarily involve license of technical information and is usually a direct commercial arrangement between the U.S. manufacturer and a foreign producer.

Overseas Investment: Investment arising from the offset agreement, taking the form of capital invested to establish or expand a subsidiary or joint venture in the foreign country.

Technology Transfer: Transfer of technology that occurs as a result of an offset agreement and that may take the form of: research and development conducted abroad; 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 a foreign entity.

Countertrade: In addition to the types of offsets defined above, various types of commercial countertrade arrangements may be required. A contract may include one or more of the following mechanisms:

> Barter: A one-time transaction only, bound under a single contract that specifies the exchange of selected goods or services for another of equivalent value.
> Counter-purchase: An agreement by the initial exporter to buy (or to find a buyer for) a specific value of goods (often stated as a percentage of the value of the original export) from the original importer during a specified time period.
> Compensation (or Buy-Back): An agreement by the original exporter to accept as full or partial repayment products derived from the original exported product.

2. STATISTICAL ABSTRACT

New data collected for this report covers calendar year 1995. In many cases, this new data has been added to the 1993 and 1994 data published in last year's report. The data is also compared to previously collected data (1980-1987) to see if any longer term trends are discernable.

New offset agreements rose to 81.5 percent of the export contract values in 1995, the third highest level since 1981 and 1987, when new offset agreements were 90 percent and nearly 100 percent of export contract values, respectively. The new agreements were valued at over $6.0 billion and included two new destinations, both in Europe. The new agreements were nearly three times the level in 1994, and 25 percent larger than 1993 levels. New offset agreements with European nations in 1995 were 104.3 percent of export contract values. The European total of $5.2 billion in new offset obligations was almost 86 percent of the world total, dominating this year's numbers.

A total of 671 offset transactions valued at $2.7 billion were reported in 1995, the greatest number and amount for the three years. Of these, European nations accounted for more than $1.9 billion, or 71 percent. Direct offsets rose to almost 40 percent in 1995, after ranging around 31 percent in each of the two prior years. This was largely accounted for by a substantial increase in subcontractor activity, especially in Europe and the "Other Areas" region.

Also, the 1995 offset transactions reports were based on 80 different exported weapon systems, seven of which appeared for the first time. For the three years, transactions were based on a total of 139 different weapon systems to a total of 32 nations worldwide.

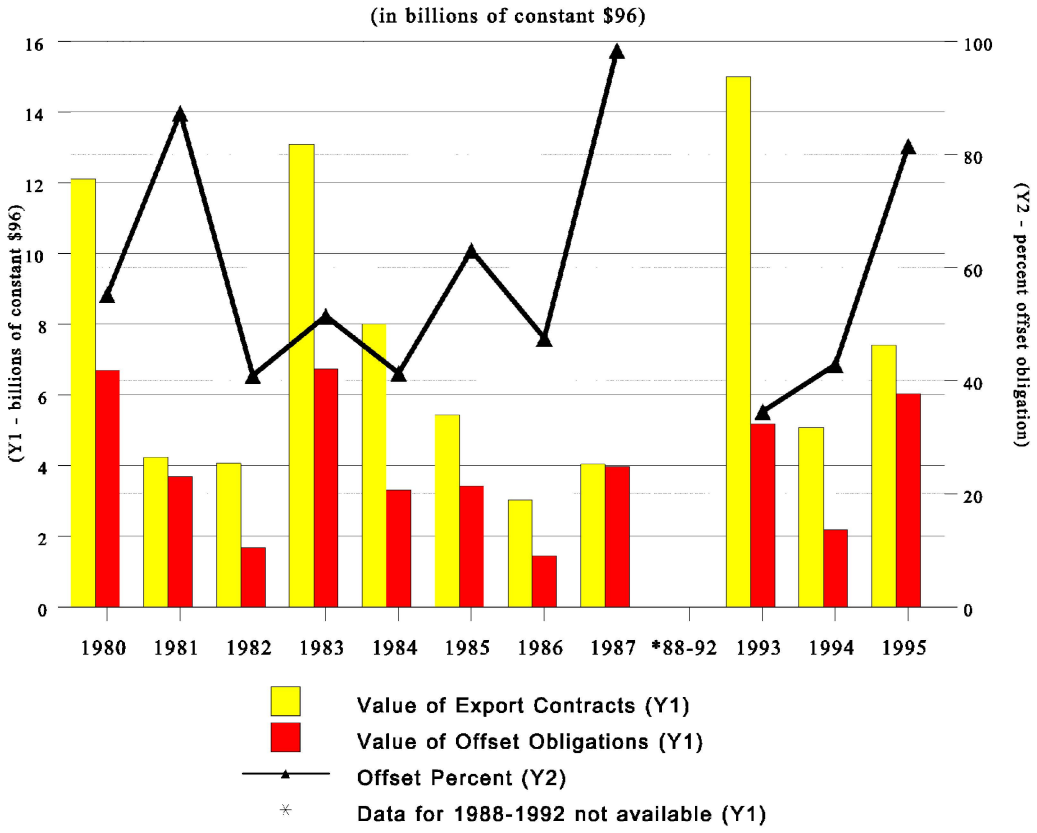
All figures are in actual dollars; no attempt has been made to correct for inflation. Also, some numbers shown in last year's report have been corrected to account for errors in reporting and interpretation.

2.1 Historical Perspective

Offsets data previously collected by the U.S. Government under Section 309 of the Defense Production Act of 1950, as amended, is reflected in *Graph 1* below to provide a historical perspective. This graph compares the OMB 1980 to 1987 offset data with the BXA 1993 to 1995 data. No data was collected for the years 1988 through 1992. Three elements are shown on the graph: the value of export sales contracts (the grey bar); the value of offset obligations (the black

bar); and the percent of the offsets to sales agreements (the line with arrowheads).

Graph 1: Offset Obligations: Selected Years



Source: *Offsets in Military Exports*, OMB, and BXA's Offset Reporting Data

The percentages of offset obligations to new export contract values fluctuate widely from year to year, as do the values of the export sales contracts and offset obligations. The lowest percentage occurred in 1993, at slightly under 35 percent, and the highest in 1987, at over 98 percent.[1] The most dramatic increase in the value of obligations as a percentage of contract values occurred between 1986 and 1987, with a jump of almost 50 percent. The second greatest year-to-year increase for which data is available occurred between 1994 and 1995, with an increase of almost 40 percent. In 1994 the percentage was 42.8 percent, while in 1995 it rose to 81.5 percent of contract values. (For a more detailed review of OMB's 1980-87 data, please see the 1996 Offsets in Defense Trade report.)

2.2 BXA Statistics, 1993-1995

2.2.1 Summary

This section of the report analyzes offset obligations and offset transactions data provided by U.S. defense prime contractors for the years 1993-1995. Future BXA *Offsets in Defense Trade* reports will add annual increments to this data. The data cited for 1993 and 1994 was reported in last year's BXA report. It is repeated here, in addition to the newly collected 1995 information,

[1] Note that in 1993, there was one export sale to Taiwan of nearly $6 billion with limited offsets. If this particular sale were removed, the overall percentage of new offset obligations would increase from 34.5 percent to 52.1 percent in 1993. Similarly, removal of a major Middle Eastern sale would push the offset obligation in 1993 to nearly 70 percent.

to establish patterns for the three-year period.

- In 1995, offset obligations were $6.0 billion on sales of $7.4 billion. New offset obligations in 1993 were $4.8 billion based on sales contracts of $13.9 billion. In 1994, the new offset obligations were $2.0 billion based on sales contracts of $4.8 billion.

- Offset transactions in fulfillment of existing offset agreements totaled about $1.9 billion in both 1993 and 1994. In 1995, that figure increased to almost $2.7 billion.

- Roughly one-third of offset transactions for 1993 and 1994 were direct (related to the defense system listed on the export sales contract). In 1995, direct offsets were 39.8 percent.

- About three-fourths of all transactions (direct and indirect) were comprised of purchases, subcontracts, or transfers of technology.

European and NATO allies imposed the highest value of offset obligations in each year from 1993-1995. As a percentage to related export sales, Europe led the world in offset demands in 1993 and 1995. Overall, for the three-year period, Europe's offset demanded 88 percent in offset obligations to support its purchases of U.S. weapon systems.

The value of offsets as a percentage of export contract values reported for Europe as a whole for the 1993-1995 period was 88 percent. In 1995, this average was 104.3 percent, with one transaction requiring an offset of nearly 150 percent. The percentages for the Middle East and Pacific Rim were much lower, although individual countries in these regions had rates above 60 percent.

Table 1 below lists selected Standard Industrial Classification (SIC) industry groups reported in offset transactions for 1993-95. These groups represent the largest total values of offsets reported by industry. The percentages do not total exactly to 100 percent, as there is overlap among the different classifications. For example, SIC codes 372 (aircraft and parts) and 3731 (ship building and repair) are both included under code 37 (transportation equipment).

Table 1. Selected SIC Industry Groups Reported in Offset Transactions, 1993-1995				
SIC		**# of**	**Actual Value**	**Percent**

Code	Industry Description	Trans.	(in $000)	of Total[1]
37	Transportation Equipment	733	3,310,540,080	50.86%
many	Aerospace related products and services	752	3,230,105,780	49.63%
372	Aircraft and Parts	684	2,786,373,831	42.81%
36	Electrical Machinery and Equipment	290	831,037,382	12.77%
35	Industrial Machinery, except Electrical	223	649,449,413	9.98%
367	Electronic Components	198	545,223,047	8.38%
61	Bank Credit	25	390,013,427	5.99%
3731	Ship Building and Repair	20	346,683,000	5.33%
366	Communications Equipment	35	139,703,152	2.15%

[1]Percentages do not total to 100 percent because there is overlap among the SIC codes shown.

Source: BXA's Offset Reporting Data

During the 1993-1995 review period, the export of aerospace weapon systems (such as aircraft, engines, and missiles) dominated sales deals in which offsets were required. In fact, over 90 percent of the actual value of all offsets in this period arose from deals which exported American-made aerospace products. Of these offsets' cumulative total value, however, only 49.63 percent is directly related to aerospace sectors. The remainder is allocated across dozens of other, mostly commercial industry sectors, including anything from metal working machine tools to foreign-made fertilizer.

Goods and services classified under SIC Major Group 37, Transportation Equipment, accounted for over 50 percent of the value of total offsets during the review period. Much of the value of aerospace-related products and services, including aircraft and parts, is captured within the broad two-digit SIC category. The subcategory 372, aircraft and parts, alone accounts for 42.8 percent of the total value of offsets. Another transportation equipment subcategory, shipbuilding and repair (SIC code 3731), comprised 5.3 percent of the actual value of offsets.

Other notable industry classifications were involved in reported offset transactions during the review period. Electrical machinery and equipment represents 12.8 percent of the total offsets value. This classification includes a subcategory for electronic components, which by themselves account for 8.4 percent of the total value, and another subcategory for communications equipment, which represents 2.2 percent of the total. Bank credit accounted for an additional 6.0 percent of the total value of offsets.

2.2.2 New Offset Agreements

Table 2 provides an overview of new offset obligations by region for the years 1993, 1994, and 1995. In 1995 an additional 45 new agreements were reported by 19 companies. In 1993 there were 29 new agreements reported by 18 companies. The number of new agreements was higher in 1994, with 49 agreements reported by a total of 18 companies.

Europe — In 1995, absolute value of new offset agreements, and their percentage to the exported sales value were up dramatically with European countries. These sales were made to the following ten countries: Belgium, Denmark, France, Germany, the Netherlands, Norway, Spain, Sweden, Switzerland, and the United Kingdom. Total new agreements to that region were offset by 104 percent, the greatest offset percentage for any region in three years of reporting. The average time in which the agreements are to be fulfilled is 132 months.

Almost half of the new offset obligations in 1993 were with European countries, while export sales to the region accounted for only 21 percent of the total 1993 sales value. These countries collectively also account for the highest 1993 offset percentage, at 78 percent. On average the 1993 European agreements were to be met within 91 months.

In 1994, European countries accounted for 41 percent of the number of new offset obligations entered into that year, and represent 31 percent of the total dollar value of new sales. The offset percentage for the new sales to Europe in 1994 was almost 51 percent. On average these agreements are to be met within 88 months.

Middle East — In 1995, only two new agreements were reported with Middle Eastern countries, Kuwait and Turkey.[2] The value of these new obligations was also relatively low in comparison

[2] Although a member of NATO, for purposes of this report Turkey is included in the Middle Eastern category.

to other regions, accounting for only one percent of total 1995 reported sales. The average offset requirement was less than in 1994, at 38 percent of the sales value. The average time in which the agreements are to be completed is also shorter, at 70 months.

In 1993, Middle Eastern countries accounted for 15 percent of the number of new offset obligations but almost 30 percent of reported 1993 total export sales, making the region second only to the Pacific Rim in terms of dollar value of sales that year. The offset requirement averaged 35 percent of that region's sales. The average time to fulfillment for 1993 Middle Eastern agreements was 96 months, the longest time frame for any region.

In 1994, the number of new offset agreements increased (from four in 1993) to six, but the actual dollar value of these new obligations was over 70 percent lower. The percentage of offsets rose, however, from 35 percent in 1993 to almost 51 percent in 1994. The average fulfillment time of these new agreements for 1994 was 88 months.

Pacific Rim — In 1995, the number of new agreements was fairly consistent with previous years, with eight new agreements reported. This is the first year during the review period (1993-1995) in which Malaysia entered into an offset agreement. The 1995 sales were collectively smaller in dollar value than those sales made in 1993 and 1994. The Pacific Rim accounted for only 14 percent of world total 1995 sales reported. The average offset percentage rose to almost 30 percent, but sales to this region still have the lowest offset requirements of any region, as was the case in 1993 and 1994. The average number of months for the new 1995 agreements to reach completion rose to 103.

Pacific Rim nations accounted for nearly half of the value of 1993 export sales, while accounting for the smallest overall offset percentage, 14 percent of the value. For 1993, Pacific Rim agreements also have the shortest average completion time, 78 months.

In 1994, new offset agreements with Pacific Rim nations increased to nine from seven in 1993. The total dollar value of these agreements dropped by 46 percent in comparison to 1993. The average number of months to fulfill the agreements was 72 months, down from 78 months in 1993.

Other Areas — The final regional category is defined as "Other Areas", based upon either the unique geographic or trade relationships the United States has with these countries. Countries included in this region were Australia, Canada, Israel, and New Zealand. In 1995 nine new

obligations were reported in this category. The actual value of these sales was much higher than those in 1994, and accounted for almost 19 percent of total 1995 sales. By dollar value this grouping was second only to Europe in sales in 1995. The offset percentage was lower for these obligations, at 40 percent. The average number of months to fulfill these agreements rose to 96.

In 1993, there were only four new agreements reported for this region, based on new sales that represented only 0.7 percent of total sales in that year. The average offset percentage was 51.3 percent, second to the percentage for Europe. In 1994 the number of new agreements rose to 14. The total value of these offset agreements grew seven-fold in comparison to their 1993 value. Export these sales represented only 11 percent of the 1994 world total. The offset percentage for these new obligations rose to 65 percent, which was highest of any region for the year. The average number of months to fulfill the 1994 agreements was 63.

World Total — Note that the exports and related offsets to the Middle East and Pacific Rim fell in 1994 and 1995. Also, the Other Areas region rose in exports and offsets each year. Europe led each year in the value of offsets demanded but was the leading export market only in 1995.

Collectively, the number of new offset agreements entered into was higher in 1994 than in 1993, and then declined slightly in 1995. The total value of the offsets varied greatly from year to year, dropping significantly from $4.79 billion in 1993 to $2.05 billion in 1994, and then sharply rising in 1995 to just over $6 billion. This is accounted for mostly by the fluctuation in Europe, which fell from $2.34 billion in offsets in 1993 to only $765 million in 1994, and then climbed to $5.16 billion in 1995. The value of export sales overall declined nearly by half during the 1993-1995 period, dropping sharply from $14 billion in 1993 to $4.8 billion in 1994, and then recovering to $7.4 billion in 1995. The average offset percentage more than doubled during the review period, climbing from 34.4 percent in 1993 to 42.8 percent in 1994 and 81.5 percent in 1995. The average length of time to fulfill these new offset agreements varied by year, averaging 87 months (7.25 years) for those new obligations in 1993, 78 months (6.5 years) for those in 1994, and 127 months (10.6 years) in 1995. These time frames are shorter than the average for the 1980-1987 period, which was 132 months (11 years).

Table 2. New Offset Obligations by Region, 1993

Region	# Deals	Exports ($000s)	Offsets ($000s)	% Offset	# Months (average)
Europe	14	2,985,017	2,338,053	78.3%	91
Middle East	4	4,143,861	1,462,100	35.3%	96
Pacific Rim	7	6,717,659	943,766	14.0%	78
Other Areas	4	98,467	50,515	51.3%	83
World Total	29	13,945,004	4,794,434	34.4%	87
World w/o large sales	*27*	*4,045,004*	*2,794,434*	*69.1%*	

** The well publicized multi-billion dollar sales of F-16s to Taiwan and F-15s to Saudi Arabia had an unusually large influence on the World totals for offsets. The numbers in italics are perhaps more representative of the true incidence of offsets.*

New Offset Obligations by Region, 1994

Region	# Deals	Exports ($000s)	Offsets ($000s)	% Offset	# Months (average)
Europe	20	1,508,234	764,830	50.7%	88
Middle East	6	819,200	417,300	50.9%	88
Pacific Rim	9	1,915,447	508,138	26.5%	72
Other Areas	14	549,539	358,448	65.2%	63
World Total	49	4,792,420	2,048,716	42.8%	78

New Offset Obligations by Region, 1995

Region	# Deals	Exports ($000s)	Offsets ($000s)	% Offset	# Months (average)
Europe	26	4,944,349	5,159,249	104.3%	132
Middle East	2	68,700	26,410	38.4%	70
Pacific Rim	8	1,010,090	301,324	29.8%	103
Other Areas	9	1,378,907	547,135	39.7%	96
World Total	45	7,402,046	6,034,118	81.5%	127

Source: BXA’s Offset Reporting Data

2.2.3 Offset Transactions

The previous section provided an overview of the new agreements reported for 1995 and reviewed new agreements reported for 1993 and 1994. This section provides a detailed view of actual offset transactions, in fulfillment of earlier agreements, that were reported during the three-year review period. Industry reported almost 1,700 transactions for this period. The great majority of these offset transactions are not connected with the new agreements addressed in the last section. They are primarily fulfillments of offset obligations agreed to in earlier years. Each transaction contains over a dozen data elements as reported by industry. Some of the more important data elements include the referenced export system, direct and indirect offsets, type of offset, country, and a categorization by industrial sector. (See Appendix B for a complete listing.) The data is presented in various ways in a series of tables in this section.

2.2.3.1 Transactions Overview: *Table 3* summarizes information gathered on offset transactions completed during 1993-1995, including the number of companies reporting, the number of different defense systems that were exported, and their destinations. As shown in the table, during the 1993-1995 review period, a total of 30 firms submitted data concerning offset transactions in which they were involved. A total of 23 reported such transactions in 1993, 21 in 1994, and 20 in 1995. The transactions are related to 139 different defense systems exported to 32 different countries. European nations were the most common recipients: 59 percent of the destinations were in that region, and 16 percent were exported to countries of the Pacific Rim. The Middle East and the nations included in the "Other Areas" category both received 12.5 percent of these systems.

Table 3. U.S. Exported Systems by Destination, 1993-1995
(based on previous and existing offset agreements)

Data Category	1993	1994	1995	1993-1995
Companies Reporting	23	21	20	30
# of Different Exported Systems	66	65	80	139
# of Different Export Destinations	27	26	26	32
# of Different Destinations by Region:				
Europe	16	16	17	19
Middle East	2	3	2	4
Pacific Rim	5	4	4	5
Other Areas	4	3	3	4

Source: BXA's Offset Reporting Data

An overview of all reported transactions in fulfillment of previous and existing obligations appears in *Table 4*. As mentioned above, during the 1993-1995 time period, 30 different firms reported making a total of 1,681 offset-related transactions. A total of 738 different public or private organizations were reported as having been a recipient of an offset transaction during the period.

These organizations ranged from very large to small firms, and included several dozen foreign government agencies, mostly from South Korea, Australia, and Greece. Most of the government entities were national defense ministries and individual branches of the armed forces. Other government entities included the Ministry of Economic Affairs, Department of Industrial Development, Committee for Aviation and Space Industry Development, and several scientific research institutes.

The majority of the recipients (560) were involved in only one or two offset transactions that totaled $2.68 billion, or 41.3 percent of the three-year total. Nineteen entities were recipients of 10 transactions or more. One firm received 35 transactions equal to $216 million. In terms of value, the largest recipient, with 16 transactions, received $248 million (3.81% of total) in offset transactions.

Of the top four transactions in terms of dollar value, three were indirect transactions while one was direct. The two largest transactions were indirect purchases of industrial machinery and computer hardware respectively. The third largest transaction was an indirect technology transfer involving welding techniques for the ship building industry, while the fourth was a direct purchase of aerospace items shipped to “various” entities not enumerated by the reporting company.

Of the total number of offset-related transactions reported, the vast majority (66 percent, or 1,109 transactions) involved Europe. Countries included in the “Other Areas” category (Australia, Canada, Israel, and New Zealand) accounted for the second largest number of transactions, with 20 percent, or 337 transactions. The Pacific Rim was involved in 184 transactions, accounting for 11 percent of total transactions, while the Middle East accounted for only 51 transactions, or 3 percent of total.

The actual value of transactions over the three-year period totaled $6.5 billion. Note Europe’s dominance, with $4.5 billion (or 70 percent) of the total value destined for that region. The nations of the “Other Areas” category received $985 million, or 15 percent of the total; $859

million or 13 percent of the total went to the Pacific Rim, and $113 million, or two percent to the Middle East. The countries were similarly ranked when the number of transactions was considered.

The average dollar value per offset transaction across all regions for the 1993-1995 review period was $3.9 million. For the Pacific Rim, it was $4.7 million per transaction. In Europe, the average dollar per transaction figure was $4.1 million, $2.9 million in the countries of the "Other Areas" category, and $2.2 million in the Middle East.

The last section of the table reports the credit values associated with the transactions in the rest of the table. Credit values are dollars credited by the foreign government, though not actually spent by the company, toward the firm's fulfillment of offset obligations. They are incentives offered by foreign governments often so that the company might meet its obligations with an especially favorable type of offset, such as technology transfer or business creation. The total credit value for all transactions reported during the 1993-1995 period was $7.8 billion, exceeding the actual total value by $1.3 billion, or 19 percent. The value of offsets credited to American firms by Europe exceeded the actual value by $672 million, or by 15 percent. In the Pacific Rim, American firms were credited $428 million in excess of the value they actually transferred, which equaled half again what was spent. The Middle East accorded U.S. firms $126 million in credit over and above what was spent, or 111 percent. The nations comprising the "Other Areas" category credited only $35 million or 3.5 percent above the actual dollar value.

Table 4. Offset Transactions Summary, 1993-1995 (in fulfillment of previous and existing offset agreements)				
Transaction Data	**1993**	**1994**	**1995**	**1993-1995**
Companies Reporting	23	21	20	30*
Reported Offset Transactions	445	565	671	1,681
# of Different Offset Transaction Recipients	268	331	385	738*
Offset Transactions by Region:				
Europe	302	370	437	1,109
Middle East	15	22	14	51
Pacific Rim	45	79	60	184
Other Areas	83	94	160	337
Offset Transactions by Region: Actual Value, Total:	$1,898,880	$1,935,325	$2,674,670	$6,508,875
Europe (in $000s)	$1,454,531	$1,193,724	$1,903,740	$4,551,995
Middle East (in $000s)	$52,730	$47,290	$13,268	$113,288
Pacific Rim (in $000s)	$172,784	$412,026	$273,704	$858,514
Other Areas (in $000s)	$218,835	$282,285	$483,958	$985,078
Offset Transactions by Region: Credit Value, Total:	$2,214,620	$2,205,875	$3,350,759	$7,771,254
Europe (in $000s)	$1,686,509	$1,321,847	$2,216,352	$5,224,708
Middle East (in $000s)	$91,730	$109,920	$37,804	$239,454
Pacific Rim (in $000s)	$179,379	$490,459	$616,888	$1,286,726
Other Areas (in $000s)	$257,002	$283,649	$479,714	$1,020,365

* Represents the number of different companies or recipients represented in the database.
Source: BXA's Offset Reporting Data

2.2.3.2 Offset Transactions by Type for Total, Direct, Indirect, and Both:

Offset requirements can be fulfilled in a number of ways. These include:

- Purchase	- Subcontractor Activity	- Credit Transfer
- Technology Transfer	- Training	- Investment
- Co-production	- Licensed Assembly	- Others

The "others" category includes marketing assistance, equipment maintenance agreements, rentals, unspecified sales, investment analysis, and other miscellaneous items. Definitions of the remaining types of offset transactions can be found in chapter 1 of this report.

Table 5 presents an overview of industry-reported transactions by offset type for 1993, 1994, and 1995. The actual value of the transactions and the amounts credited toward the offset obligations incurred before 1995 are detailed for the nine types of offsets.

During 1995, the total value of offsets rose substantially and there were significant shifts among categories. The data indicate that the total actual value of offsets rose 38 percent in 1995 by more than $700 million, from $1.9 billion in 1994 to almost $2.7 billion. Many categories experienced significant shifts in their value during the 1993-1995 period when compared to their reported 1993 and 1994 values. For example, the offset type "credit transfer" ranked third by value in 1993, with a reported total value of $278 million. This type dropped to ninth in 1994, with a reported value of only $3.5 million, a drop of almost 99 percent. In 1995, credit transfer transactions once again increased in value, climbing to $374 million, moving this type back to third by value. These significant shifts in value are repeated in other categories such as technology transfer, co-production, and investment. This process is inherent due to the fact that there were relatively few transactions in 1994: a single large contract can thus greatly impact the values of a given year. This pattern is seen in the credited values of offsets as well; these appear in the bottom half of *Table 5*. More data is needed to confirm this trend.

The volatility is further explained by the steady attrition of transactions on completed older agreements and an increase of new ones. Annual regional variations may also explain some of the volatility. As outlined in *Table 9* later in this text, Europe dropped from $1.45 billion in offset transactions in 1993 to $1.19 billion in 1994, down about 18 percent, yet climbed significantly to $1.9 billion in 1995. The Pacific Rim rose dramatically from $173 million in 1993 to $412 million in 1994, then fell to $274 million in 1995. Over the three-year period, offset transactions with the Middle East have declined from $52 million to $12 million, while

those to the “Other Areas” category have grown slowly and constantly, leading to that category's rise from 12 to 18.1 percent of the total.

The actual value for offsets from 1993-1995 totaled $6.5 billion, while total credited value was $7.8 billion. Purchasing has been consistently one of the two largest types of offsets, both in terms of actual and credited values. By percentage of total actual value, this type of offset transaction has experienced an overall decline during the three-year period, decreasing from 35.1 percent to 30.6 percent, influenced by a sharp increase in subcontractor activity reported in 1995. Viewed in terms of actual dollar amounts, purchases grew during the 1993-1995 period, with an overall increase of 23 percent for actual values (from $666 million in 1993 to $819 million in 1995) and 11.6 percent for credited values (from $795 million in 1993 to $887.5 million in 1995). These fluctuations by year, and the greater annual value of credited versus actual offsets, are typical of the other types of offset transactions, as shown.

Table 5. Total Offset Transactions by Type, 1993-1995								
Offset Type	**Actual Transaction Values, in $000s**							
	1993		**1994**		**1995**		**1993-1995**	
	Value	**% of Total**	**Value**	**% of Total**	**Value**	**% of Total**	**Grand Total**	**% of Total**
Total	**1,898,880**	**100%**	**1,935,325**	**100%**	**2,674,671**	**100%**	**6,508,875**	**100%**
Purchase	665,839	35.1%	601,701	31.1%	818,813	30.6%	2,086,353	32.1%
Subcontractor Activity	375,919	19.8%	360,323	18.6%	824,011	30.8%	1,560,253	24.0%
Credit Transfer	278,221	14.7%	3,494	0.2%	374,248	14.0%	862,800	13.3%
Technology Transfer	183,307	9.7%	462,569	23.9%	216,924	8.1%	655,962	10.1%
Other	119,840	6.3%	149,602	7.7%	127,881	4.8%	397,323	6.1%
Training	167,994	8.8%	107,912	5.6%	104,645	3.9%	380,552	5.9%
Investment	34,358	1.8%	92,405	4.8%	117,152	4.4%	243,915	3.8%
Co-production	35,550	1.9%	111,895	5.8%	85,887	3.2%	233,332	3.6%
Lic. Prod./Assembly	37,851	2.0%	45,424	2.3%	5,110	0.2%	88,385	1.4%
Offset Type	**Values Credited Toward Offsets, in $000s**							
	1993		**1994**		**1995**		**1993-1995**	
	Value	**% of Total**	**Value**	**% of Total**	**Value**	**% of Total**	**Grand Total**	**% of Total**
Total	**2,214,620**	**100%**	**2,205,875**	**100%**	**3,350,759**	**100%**	**7,771,254**	**100%**
Purchase	794,975	35.9%	682,829	30.9%	887,520	26.5%	2,365,325	30.4%
Subcontractor Activity	477,190	21.5%	372,379	16.9%	881,577	26.3%	1,731,145	22.3%
Credit Transfer	304,523	13.8%	21,639	1.0%	468,930	14.0%	962,553	12.4%
Technology Transfer	203,504	9.2%	495,849	22.5%	263,201	7.9%	795,091	10.2%
Other	137,042	6.2%	164,230	7.4%	214,170	6.4%	515,442	6.6%
Training	186,027	8.4%	191,520	8.7%	180,953	5.4%	558,501	7.2%
Investment	34,358	1.6%	97,614	4.4%	363,556	10.8%	495,528	6.4%
Co-production	35,550	1.6%	112,185	5.1%	85,887	2.6%	233,622	3.0%
Lic.Prod./Assembly	41,451	1.9%	67,629	3.1%	4,965	0.1%	114,045	1.5%

Source: BXA’s Offset Reporting Data

The next three tables break down the information in *Table 5* by direct, indirect, and combination offsets. *Table 6* shows that direct offsets were $582.4 million in 1993, rose to almost $600 million in 1994, and then increased sharply to nearly $1.1 billion in 1995, growing almost 83 percent during the 1993-1995 review period. As a percentage of total actual offset values, direct offsets were 33 percent in 1993, 34 percent in 1994, and almost 40 percent in 1995. The percentage increase of direct offsets in 1995 is attributable in part to corrections to the categorizations of certain reported transactions. The 1995 table includes the "purchase" transactions solely as indirect offsets and the "subcontractor activity" solely as direct offsets. The "licensed production" and "co-production" transaction types are also categorized entirely as direct offsets in the 1995 data. These groupings were divided between direct and indirect offsets in the 1993 and 1994 data because of apparent mislabeling in the survey responses. For example, some firms labeled "purchases" as direct offsets in 1993 and 1994; in 1995, "purchases" previously identified as direct offsets were now reclassified as "subcontractor activity, " which helps explain the dramatic increase in that category.

Among offset transaction types, "subcontractor activity" transactions exhibited the greatest year-to-year fluctuations in actual value. In 1993 and 1994, subcontractor activity and purchase transaction types collectively accounted for 48.7 percent and 39.9 percent, respectively, of total direct offsets, then rose sharply to account for 77.4 percent of 1995 direct offsets. By dollar value these transactions rose from $239 million in 1994 to $824 million in 1995, a 245 percent increase. As a result of this major increase, almost every other category declined as a percentage of direct offsets. Technology transfer, while still the second largest type of direct offset, dropped from 19.1 percent in 1994 to 10.4 percent in 1995, much closer to the 1993 figure of 11.2 percent. The "Other" category has declined the most since 1993, when it represented 28.2 percent of direct offsets. In 1995, it represented a mere 2.2 percent. In terms of dollar value, it has declined by 85.6 percent, from $164 million to $23.6 million. Co-production ranks third among direct offsets in 1995 with 8.1 percent, a significant drop from the 18.5 percent of direct offsets that it accounted for in 1994.

The trends exhibited by credited offset transaction types tend to be consistent with those already discussed for actual offset transactions. There were significant fluctuations from year-to-year in most categories. The subcontractor activity category serves as an excellent example. In 1993 the cumulative credited value was $207 million, the largest dollar value of any category (30.3 percent of that year's total credited dollar value). The next year the dollar value dropped to $158 million, although the subcontractor activity category remained the largest single category, with 20.5 percent of the 1994 total. In 1995, however, this category experienced a significant increase, with a total credited dollar value of $881.6 million, accounting for 70.1 percent of that year's total.

Table 6. Direct Offset Transactions by Type, 1993-1995								
Offset Type	**Actual Transaction Values, in $000s**							
	1993		**1994**		**1995**		**1993-1995**	
	Value	**% of Total**	**Value**	**% of Total**	**Value**	**% of Total**	**Grand Total**	**% of Total**
Total	**582,437**	**100%**	**599,967**	**100%**	**1,064,128**	**100%**	**2,246,532**	**100%**
Purchase	104,694	18.0%	93,003	15.5%	0	0.0%	197,697	8.8%
Subcontractor Activity	178,570	30.7%	146,139	24.4%	824,011	77.4%	1,148,720	51.1%
Credit Transfer	0	0.0%	494	0.1%	3,511	0.3%	4,005	0.2%
Technology Transfer	64,943	11.2%	114,494	19.1%	110,120	10.4%	289,557	12.9%
Other	164,372	28.2%	50,913	8.5%	23,618	2.2%	238,903	10.6%
Training	9,588	1.7%	46,602	7.8%	11,871	1.1%	68,061	3.0%
Investment	25,834	4.4%	33,302	5.6%	5,110	0.5%	64,246	2.9%
Co-production	34,435	5.9%	111,170	18.5%	85,887	8.1%	231,492	10.3%
Lic. Prod./Assembly	0	0.0%	3,850	0.6%	0	0.0%	3,850	0.2%
Offset Type	**Values Credited Toward Offsets, in $000s**							
	1993		**1994**		**1995**		**1993-1995**	
	Value	**% of Total**	**Value**	**% of Total**	**Value**	**% of Total**	**Grand Total**	**% of Total**
Total	**683,182**	**100%**	**773,369**	**100%**	**1,257,944**	**100%**	**2,714,495**	**100%**
Purchase	144,755	21.2%	132,511	17.1%	0	0.0%	277,266	10.2%
Subcontractor Activity	207,242	30.3%	158,195	20.5%	881,577	70.1%	1,247,014	45.9%
Credit Transfer	0	0.0%	18,639	2.4%	39,893	3.2%	58,532	2.2%
Technology Transfer	84,107	12.3%	147,706	19.1%	134,102	10.7%	365,915	13.5%
Other	176,205	25.8%	98,696	12.8%	67,755	5.4%	342,656	12.6%
Training	10,603	1.6%	50,405	6.5%	43,766	3.5%	104,774	3.9%
Investment	25,834	3.8%	51,907	6.7%	4,965	0.4%	82,706	3.0%
Co-production	34,435	5.0%	111,460	14.4%	85,887	6.8%	231,782	8.5%
Lic.Prod./Assembly	0	0.0%	3,850	0.5%	0	0.0%	3,850	0.1%

Source: BXA's Offset Reporting Data

Table 7 presents the indirect offset figures for the 1993-1995 period. These statistics show that the dollar value of actual indirect offsets rose from just under $1.2 billion in 1993 to about $1.6 billion in 1995, an increase of 35 percent. As mentioned earlier, the 1995 data is somewhat altered from that collected for 1993 and 1994, because in 1995, for the first time, reported purchase transactions are shown as indirect offsets only.

Throughout the three-year period, purchase transactions dominate reported indirect offsets, reaching over 50 percent in 1995. There were significant fluctuations in a number of transaction categories. For example, credit transfer transactions dropped 99 percent between 1993 and 1994, down to $3 million, yet in 1995 these transactions soared to $370 million. Credit transfer transactions comprised 23 percent of reported 1995 indirect offsets, making them the second largest transaction type. Technology transfer transactions also fluctuated greatly during the three-year review period, rising from 7.7 percent of the 1993 total value to 24.3 percent in 1994, only to drop by 63 percent between 1994 and 1995 (from $285 million to $106 million), representing only 6.6 percent of 1995 indirect transfers. Licensed production and assembly transactions rose in 1995 to become the third largest source of indirect offsets (7.3 percent), followed closely by training transactions (7.2 percent).

Table 8 presents data for combination (both direct and indirect) offsets for the period. No companies reported combination offsets for 1995. Combination offsets totaled $126 million in 1993, which comprised about 7 percent of all offsets in that year. In 1994, combination offsets totaled $160.9 million, about 8 percent of that year's total. No one type dominated the category; purchases led in 1993 with 34.2 percent of actual value, and technology transfer led in 1994 with 39.2 percent of actual value.

Table 7. Indirect Offset Transactions by Type, 1993-1995

Offset Type	Actual Transaction Values, in $000s							
	1993		1994		1995		1993-1995	
	Value	% of Total	Value	% of Total	Value	%of Total	Grand Total	%of Total
Total	**1,190,378**	**100%**	**1,174,428**	**100%**	**1,610,543**	**100%**	**3,975,349**	**100%**
Purchase	518,045	43.5%	462,110	39.3%	818,813	50.8%	1,798,968	45.3%
Subcontractor Activity	179,348	15.1%	204,159	17.4%	0	0.0%	383,507	9.6%
Credit Transfer	278,221	23.3%	3,000	0.3%	370,737	23.0%	651,958	16.4%
Technology Transfer	91,131	7.7%	285,075	24.3%	106,804	6.6%	483,010	12.2%
Other	3,622	0.3%	56,999	4.9%	81,027	5.0%	141,648	3.6%
Training	110,252	9.3%	103,000	8.8%	116,010	7.2%	329,262	8.3%
Investment	0	0.0%	105	0.0%	0	0.0%	105	0.0%
Co-production	0	0.0%	725	0.1%	0	0.0%	725	0.0%
Lic. Prod./Assembly	9,758	0.8%	59,255	5.0%	117,152	7.3%	186,165	4.7%
Offset Type	**Values Credited Toward Offsets, in $000s**							
	1993		1994		1995		1993-1995	
	Value	% of Total	Value	% of Total	Value	% of Total	Grand Total	% of Total
Total	**1,400,546**	**100%**	**1,267,076**	**100%**	**2,092,814**	**100%**	**4,760,436**	**100%**
Purchase	607,120	43.3%	503,731	39.8%	887,520	42.4%	1,998,371	42.0%
Subcontractor Activity	251,947	18.0%	204,159	16.1%	0	0.0%	456,106	9.6%
Credit Transfer	304,523	21.7%	3,000	0.2%	429,037	20.5%	736,560	15.5%
Technology Transfer	90,936	6.5%	284,843	22.5%	129,099	6.2%	504,878	10.6%
Other	9,822	0.7%	92,224	7.3%	113,198	5.4%	215,244	4.5%
Training	126,439	9.0%	113,825	9.0%	170,404	8.1%	410,668	8.6%
Investment	0	0.0%	105	0.0%	0	0.0%	105	0.0%
Co-production	0	0.0%	725	0.1%	0	0.0%	725	0.0%
Lic.Prod./Assembly	9,758	0.7%	64,464	5.1%	363,556	17.4%	437,778	9.2%

Source: BXA’s Offset Reporting Data

Table 8: Combination Direct/Indirect Offset Transactions by Type, 1993-1995								
Offset Type	**Actual Transaction Values, in $000s**							
	1993		**1994**		**1995**		**1993-1995**	
	Value	**% of Total**	**Value**	**% of Total**	**Value**	**%of Total**	**Grand Total**	**% of Total**
Total	**126,065**	**100%**	**160,930**	**100%**	**none**		**286,995**	**100%**
Purchase	43,100	34.2%	46,588	29.0%	-		89,688	31.3%
Subcontractor Activity	18,000	14.3%	10,025	6.2%	-		28,025	9.8%
Credit Transfer	0	0.0%	0	0.0%	-		0	0.0%
Technology Transfer	27,234	21.6%	63,000	39.2%	-		90,234	31.4%
Other	0	0.0%	0	0.0%	-		0	0.0%
Training	0	0.0%	0	0.0%	-		0	0.0%
Investment	24,600	19.5%	29,300	18.2%	-		53,900	18.8%
Co-production	1,115	0.9%	0	0.0%	-		1,115	0.4%
Lic. Prod./Assembly	12,017	9.5%	12,017	7.5%	-		24,034	8.4%
Offset Type	**Values Credited Toward Offsets, in $000s**							
	1993		**1994**		**1995**		**1993-1995**	
	Value	**% of Total**	**Value**	**% of Total**	**Value**	**% of Total**	**Grand Total**	**% of Total**
Total	**130,893**	**100%**	**165,430**	**100%**	**none**		**296,323**	**100%**
Purchase	43,100	32.9%	46,588	28.2%	-		89,688	30.3%
Subcontractor Activity	18,000	13.8%	10,025	6.1%	-		28,025	9.5%
Credit Transfer	0	0.0%	0	0.0%	-		0	0.0%
Technology Transfer	28,461	21.7%	63,300	38.3%	-		91,761	31.0%
Other	0	0.0%	0	0.0%	-		0	0.0%
Training	0	0.0%	600	0.4%	-		600	0.2%
Investment	24,600	18.8%	29,300	17.7%	-		53,900	18.2%
Co-production	1,115	0.9%	0	0.0%	-		1,115	0.4%
Lic.Prod./Assembly	15,617	11.9%	15,617	9.4%	-		31,234	10.5%

Source: BXA’s Offset Reporting Data

2.2.3.3 Offset Transactions by Region for Direct, Indirect and Both: *Table 9* breaks down offset totals by percent of world and region for direct, indirect, and combination offsets. The data shows that European offset transactions make up more than 63 percent of each category for two out of three years, dominating the world totals. The one exception: transactions with "Other Areas" made up almost two-thirds of the value for combination offsets in 1994. The Pacific Rim and Middle East accounted for a smaller percentage of total offsets in 1995, in comparison to 1994, while the share of offsets to "Other Areas" rose. As mentioned earlier, no combination offsets were reported for 1995.

The portion of total offsets accounted for by direct offset transactions varied by region. Europe captured nearly two-thirds of all direct offset transactions for all three years of the review period, although direct offsets made up a relatively small portion of total offsets for that region. The 1993 data for Europe shows that direct offsets made up only 25.8 percent of the total European offsets value of $1.45 billion, while in the Pacific Rim, direct offsets accounted for 55.5 percent of that region's total. The 1994 figures show an even wider difference. Direct offsets accounted for almost 65 percent of all Middle Eastern offsets, while in "Other Areas" direct offsets were only 27.4 percent of the total. As a percentage of total European transactions, direct offsets in 1995 increased only slightly over 1994 levels.

Similar variations appear in the data collected for indirect offsets for each region. As *Table 9* shows, in 1993 indirect offsets made up 36.9 percent of the Pacific Rim's total offset value, while they accounted for 68.7 percent of Europe's total. In 1993, Europe accounted for 84 percent of all indirect offsets reported, the highest percentage of any category for the three year period. In 1994, the Pacific Rim's share of indirect offsets grew, accounting for 66.7 percent of offsets within that region; this figure rose to 76.3 percent in 1995. In Europe, indirect offsets accounted for 63.7 percent of the total for the region in 1994, a slight decrease, and then dipped only slightly, to 63.5 percent, in the following year. Both the Middle East and "Other Areas" experienced fluctuations in their percentage of indirect offsets; indirect transactions with these regions never totaled more than 11.1 percent of total world offsets.

Combination offsets played the largest role in the "Other Areas" region, accounting for 15 percent of the area's total offsets in 1993 and 37.6 percent in 1994. In contrast, there were no combination offsets reported for the Middle East for any of the three years, and combination offsets never rose above 8 percent of the total value for Europe and the Pacific Rim. There were no reported 1995 combination offsets.

Table 9. Offset Transactions by Region, 1993, 1994, and 1995 (in $000s)

		Europe: Actual Transaction Values			Pacific Rim: Actual Transaction Values			Middle East: Actual Transaction Values			Other Areas[1]: Actual Transaction Values		
Year	Category	Value ($000)	% of Total world category	% of region total	Value ($000)	% of Total world category	% of region total	Value ($000)	% of Total world category	% of region total	Value ($000)	% of Total world category	% of region total
1993	**Total**	**$1,454,531**	**76.6%**	**100.0%**	**$172,784**	**9.1%**	**100.0%**	**$52,190**	**2.7%**	**100.0%**	**$218,835**	**11.5%**	**100.0%**
1993	Direct	$374,687	64.3%	25.8%	$95,886	16.5%	55.5%	$23,017	4.0%	44.1%	$88,847	15.3%	40.6%
1993	Indirect	$999,739	84.0%	68.7%	$63,766	5.4%	36.9%	$29,173	2.5%	55.9%	$97,159	8.2%	44.4%
1993	Both	$80,105	63.5%	5.5%	$13,132	10.4%	7.6%	$0	0.0%	0.0%	$32,829	26.0%	15.0%
1994	**Total**	**$1,193,724**	**62.9%**	**100.0%**	**$412,026**	**21.7%**	**100.0%**	**$11,266**	**0.6%**	**100.0%**	**$282,285**	**14.9%**	**100.0%**
1994	Direct	$390,406	65.1%	32.7%	$124,825	20.8%	30.3%	$7,263	1.2%	64.5%	$77,473	12.9%	27.4%
1994	Indirect	$760,658	64.8%	63.7%	$274,986	23.4%	66.7%	$4,003	3.4%	35.5%	$98,757	8.4%	35.0%
1994	Both	$42,660	26.5%	3.6%	$12,215	7.6%	3.0%	$0	0.0%	0.0%	$106,055	65.9%	37.6%
1995	**Total**	**$1,903,740**	**71.2%**	**100.0%**	**$273,704**	**10.2%**	**100.0%**	**$12,624**	**0.5%**	**100.0%**	**$484,602**	**18.1%**	**100.0%**
1995	Direct	$694,178	65.2%	36.5%	$64,822	6.1%	23.7%	$0	0.0%	0.0%	$305,128	28.7%	63.0%
1995	Indirect	$1,209,562	75.1%	63.5%	$208,882	13.0%	76.3%	$12,624	0.8%	100.0%	$179,474	11.1%	37.0%
1995	Both[2]	$0	0.0%	0.0%	$0	0.0%	0.0%	$0	0.0%	0.0%	$0	0.0%	0.0%

[1] Other = Canada, Australia, New Zealand, and Israel
[2] No combination offsets were reported for 1995

Source: BXA's Offset Reporting Data

2.2.3.4 Offset Transactions by Region and Type, for Direct, Indirect, and Both: The next eight tables provide the greatest detail on offsets by type, region, and year for direct, indirect, and combination offsets. *Tables 10A*, *10B*, and *10C* expand on *Table 6* by breaking down the direct offset purchases by region. Europe dominates in almost every category, from 59.1 percent of subcontractor activity transactions to 100 percent of credit transfer transactions. In only one transaction category, licensed production and assembly, does it not hold the largest percentage share. In this case the "Other Areas" leads with 62.6 percent. The Pacific Rim awarded substantial credits from training in 1995; while the actual value was $8.4 million, the credited value was more than $52.5 million, a trend which began in 1994. This is the only category or region to see credit values significantly higher than actual transaction values.

Direct offsets as a percentage of total offsets increased to 40 percent in 1995 over the 1993-1994 average of about 33 percent. In 1993, total (direct, indirect, and combination) subcontractor activity totaled $376 million; in 1994, it totaled $360 million. In 1995, it reached $824 million: of this, Europe was on the receiving end of nearly $500 million in subcontracting transactions, and countries of the "Other Areas" category claimed almost $300 million.

Tables 11A, *11B*, and *11C* display data for indirect offset transactions during the 1993-1995 period. In 1993, purchase transactions alone accounted for 43.5 percent of all indirect transactions, and in 1994 accounted for 39.3 percent. In 1995, that figure rose to 51 percent. Transactions with Europe accounted for most of the value throughout.

Credit transfer transactions made up the second largest portion of the 1993 total, with 23.4 percent of indirect offsets. However, in 1994 credit transfers constituted less than one-quarter of one percent of all indirect offsets. That year, technology transfer transactions accounted for almost 25 percent of all indirect offsets, up from 7.7 percent in 1993. The "Other Transactions" category was nine percent of the total indirect for both 1993 and 1994. In 1995 credit transfers rebounded to make up 23 percent of the actual value of all indirect offsets. Technology transfer comprised 6.6 percent, while "other" comprised 7.2 percent.

Tables 12A and *12B* summarize 1993 and 1994 data for combination offset transactions.[3] There were a total of 18 such transactions reported during that two-year period. Europe received the largest share of these transactions in 1993, but the "Other Areas" region was predominant in 1994, in terms of value.

[3] As previously mentioned, no combination transactions were reported for 1995.

Certain offset categories demonstrated significant fluctuation as a percentage of total offsets over the years under consideration. Subcontractor activity remained steady at 19 and 18 percent of total offsets in 1993 and 1994 respectively, but jumped to 31 percent of the total in 1995. Credit transfer declined from 16 percent of total offsets in 1993 to one-fifth of one percent in 1994, and rebounded to 14 percent in 1995. Technology transfer comprised just eight percent of total offsets in 1993. The next year it rose to 21 percent, and then fell back to eight percent in 1995.

Table 10A. Direct Offset Transactions by Region, 1993 Subgrouped by Type, in $000s										
	Actual Values					Values Credited Toward Offsets				
Year	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993
Type\Region	Europe	Pacific Rim	Middle East	Other	World Total	Europe	Pacific Rim	Middle East	Other	World Total
Number of Transactions	58	29	5	39	131	58	29	5	39	131
Total	374,687	95,886	23,017	88,847	582,437	420,107	94,381	62,017	106,676	683,182
% of World Total	64.33%	16.46%	3.95%	15.25%	100%	61.49%	13.81%	9.08%	15.61%	100%
Purchase	17,009	38,542	18,531	30,612	104,694	18,070	38,542	57,531	30,612	144,755
% of World	16.25%	36.81%	17.70%	29.24%	100%	12.48%	26.63%	39.74%	21.15%	100%
Subcontractor Activity	126,531	1,048	0	50,991	178,570	155,342	1,048	0	50,852	207,242
% of World	70.86%	0.59%	0.0%	28.56%	100%	74.96%	0.51%	0.0%	24.54%	100%
Credit Transfer	0	0	0	0	0	0	0	0	0	0
% of World	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Technology Transfer	57,600	4,588	0	2,755	64,943	58,100	5,284	0	20,723	84,107
% of World	88.69%	7.06%	0.0%	4.24%	100%	69.08%	6.28%	0.0%	24.64%	100%
Training	131,773	31,195	0	1,405	164,372	146,526	28,274	0	1,405	176,205
% of World	80.17%	18.98%	0.0%	0.85%	100%	83.16%	16.05%	0.0%	0.80%	100%
Other	8,944	560	0	84	9,588	9,239	1,280	0	84	10,603
% of World	93.28%	5.84%	0.0%	0.88%	100%	87.14%	12.07%	0.0%	0.79%	100%
Licensed Prod./Assembly	10,281	12,553	0	3,000	25,834	10,281	12,553	0	3,000	25,834
% of World	39.80%	48.59%	0.0%	11.61%	100%	39.80%	48.59%	0.0%	11.61%	100%
Co-production	22,549	7,400	4,486	0	34,435	22,549	7,400	4,486	0	34,435
% of World	65.48%	21.49%	13.03%	0.0%	100%	65.48%	21.49%	13.03%	0.0%	100%
Investment	0	0	0	0	0	0	0	0	0	0
% of World	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Source: BXA's Offset Reporting Data

Table 10B. Direct Offset Transactions by Region, 1994 Subgrouped by Type, in $000s										
	Actual Values					Values Credited Toward Offsets				
Year	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994
Type\Region	Europe	Pacific Rim	Middle East	Other	World Total	Europe	Pacific Rim	Middle East	Other	World Total
Number of Transactions	74	49	4	29	156	74	49	4	29	156
Total	390,406	124,825	7,263	77,473	599,967	479,377	164,958	46,253	82,781	773,369
% of World Total	65.07%	20.81%	1.21%	12.91%	100%	61.99%	21.33%	5.98%	10.70%	100%
Purchase	25,627	25,472	6,884	35,020	93,003	26,094	25,522	45,874	35,020	132,511
% of World	27.56%	27.39%	7.40%	37.65%	100%	19.69%	19.26%	34.62%	26.43%	100%
Subcontractor Activity	103,049	3,808	0	39,282	146,139	115,247	3,808	0	39,140	158,195
% of World	70.51%	2.61%	0.0%	26.88%	100%	72.85%	2.41%	0.0%	24.74%	100%
Credit Transfer	0	0	0	0	0	18,639	0	0	0	18,639
% of World	0.0%	0.0%	0.0%	0.0%	0.0%	100%	0.0%	0.0%	0.0%	100%
Technology Transfer	80,559	30,456	379	3,100	114,494	117,677	21,100	379	8,550	147,706
% of World	70.36%	26.60%	0.33%	2.71%	100%	79.67%	14.29%	0.26%	5.79%	100%
Training	18,123	32,720	0	70	50,913	20,133	78,493	0	70	98,696
% of World	35.60%	64.27%	0.0%	0.14%	100%	20.40%	79.53%	0.0%	0.07%	100%
Other	43,495	3,107	0	0	46,602	43,632	6,773	0	0	50,405
% of World	93.33%	6.67%	0.0%	0.0%	100%	86.56%	13.44%	0.0%	0.0%	100%
Licensed Prod./Assembly	29,855	3,447	0	0	33,302	48,460	3,447	0	0	51,907
% of World	89.65%	10.35%	0.0%	0.0%	100%	93.36%	6.64%	0.0%	0.0%	100%
Co-production	85,355	25,815	0	0	111,170	85,645	25,815	0	0	111,460
% of World	76.78%	23.22%	0.0%	0.0%	100%	76.84%	23.16%	0.0%	0.0%	100%
Investment	3,850	0	0	0	3,850	3,850	0	0	0	3,850
% of World	100%	0.0%	0.0%	0.0%	100%	100%	0.0%	0.0%	0.0%	100%

Source: BXA's Offset Reporting Data

Table 10C. Direct Offset Transactions by Region, 1995 Subgrouped by Type, in $000s										
	Actual Values					Values Credited Toward Offsets				
Year	1995	1995	1995	1995	1995	1995	1995	1995	1995	1995
Type\Region	Europe	Pacific Rim	Middle East	Other	World Total	Europe	Pacific Rim	Middle East	Other	World Total
Number of Transactions	124	32	0	47	203	124	32	0	47	203
Total	694,179	64,821	0	305,128	1,064,128	821,737	129,361	0	306,847	1,257,945
% of World Total	65.2%	6.1%	0.0%	28.7%	100.0%	65.3%	10.3%	0.0%	24.4%	100.0%
Purchase	0	0	0	0	0	0	0	0	0	0
% of World	0.00%	0.00%	0.00%	0.00%	0%	0.00%	0.00%	0.00%	0.00%	0%
Subcontractor Activity	487,401	38,249	0	298,361	824,011	526,301	56,523	0	298,753	881,577
% of World	59.1%	4.6%	0.0%	36.2%	100.0%	59.7%	6.4%	0.0%	33.9%	100.0%
Credit Transfer	3511	0	0	0	0	39,893	0	0	0	39,893
% of World	100.0%	0.0%	0.0%	0.0%	100.0%	100.0%	0.0%	0.0%	0.0%	100.0%
Technology Transfer	97,825	10,295	0	2,000	110,120	121,246	10,856	0	2,000	134,102
% of World	88.8%	9.3%	0.0%	1.8%	100.0%	90.4%	8.1%	0.0%	1.5%	100.0%
Training	15,000	8,379	0	239	23,618	15,000	52,516	0	239	67,755
% of World	63.5%	35.5%	0.0%	1.0%	100.0%	22.1%	77.5%	0.0%	0.4%	100.0%
Other	10,511	32	0	1,328	11,871	39,511	1,600	0	2,655	43,766
% of World	88.5%	0.3%	0.0%	11.2%	100.0%	90.3%	3.7%	0.0%	6.1%	100.0%
Licensed Prod./Assembly	1,910	0	0	3,200	5,110	1,765	0	0	3,200	4,965
% of World	37.4%	0.0%	0.0%	62.6%	100.0%	35.5%	0.0%	0.0%	64.5%	100.0%
Co-production	78,021	7,866	0	0	85,887	78,021	7,866	0	0	85,887
% of World	90.8%	9.2%	0.0%	0.0%	100.0%	90.8%	9.2%	0.0%	0.0%	100.0%
Investment	0	0	0	0	0	0	0	0	0	0
% of World	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Source: BXA's Offset Reporting Data

Table 11A. Indirect Offset Transactions by Region, 1993 Subgrouped by Type, in $000s										
	Actual Values					Values Credited Toward Offsets				
Year	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993
Type\Region	Europe	Pacific Rim	Middle East	Other	World Total	Europe	Pacific Rim	Middle East	Other	World Total
Number of Transactions	240	14	10	42	306	240	14	10	42	306
Total	999,739	63,766	29,713	97,159	1,190,378	1,185,070	68,266	29,713	117,497	1,400,546
% of World Total	83.99%	5.36%	2.50%	8.16%	100%	84.61%	4.87%	2.12%	8.39%	100%
Purchase	389,608	25,876	29,341	73,220	518,045	459,852	24,176	29,341	93,751	607,120
% of World	75.21%	5.00%	5.66%	14.13%	100%	75.74%	3.98%	4.83%	15.44%	100%
Subcontractor Activity	166,502	0	0	12,846	179,348	239,101	0	0	12,846	251,947
% of World	92.84%	0.0%	0.0%	7.16%	100%	94.90%	0.0%	0.0%	5.10%	100%
Credit Transfer	271,721	0	0	6,500	278,221	298,023	0	0	6,500	304,523
% of World	97.7%	0.0%	0.0%	2.3%	100%	97.9%	0.0%	0.0%	2.1%	100%
Technology Transfer	57,398	32,390	0	1,343	91,131	57,396	32,390	0	1,150	90,936
% of World	62.98%	35.54%	0.0%	1.47%	100%	63.12%	35.62%	0.0%	1.26%	100%
Training	0	0	372	3,250	3,622	0	6,200	372	3,250	9,822
% of World	0.0%	0.0%	10.27%	89.73%	100%	0.0%	63.12%	3.79%	33.09%	100%
Other	104,752	5,500	0	0	110,252	120,939	5,500	0	0	126,439
% of World	95.01%	4.99%	0.0%	0.0%	100%	95.65%	4.35%	0.0%	0.0%	100%
Licensed Prod./Assembly	0	0	0	0	0	0	0	0	0	0
% of World	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Co-production	0	0	0	0	0	0	0	0	0	0
% of World	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Investment	9,758	0	0	0	9,758	9,758	0	0	0	9,758
% of World	100%	0.0%	0.0%	0.0%	100%	100%	0.0%	0.0%	0.0%	100%

Source: BXA's Offset Reporting Data

Table 11B. Indirect Offset Transactions by Region, 1994 Subgrouped by Type, in $000s										
	Actual Values					Values Credited Toward Offsets				
Year	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994
Type\Region	Europe	Pacific Rim	Middle East	Other	World Total	Europe	Pacific Rim	Middle East	Other	World Total
Number of Transactions	291	28	18	62	399	291	28	18	62	399
Total	760,658	274,986	40,027	98,757	1,174,428	798,910	309,686	63,667	94,813	1,267,076
% of World Total	64.77%	23.41%	3.41%	8.41%	100%	63.05%	24.44%	5.02%	7.48%	100%
Purchase	345,347	34,527	22,894	59,342	462,110	376,155	34,527	37,651	55,398	503,731
% of World	74.73%	7.47%	4.95%	12.84%	100%	74.67%	6.85%	7.47%	11.00%	100%
Subcontractor Activity	174,742	0	0	29,417	204,159	174,742	0	0	29,417	204,159
% of World	85.59%	0.0%	0.0%	14.41%	100%	85.59%	0.0%	0.0%	14.41%	100%
Credit Transfer	3,000	0	0	0	3,000	3,000	0	0	0	3,000
% of World	100%	0.0%	0.0%	0.0%	100%	100%	0.0%	0.0%	0.0%	100%
Technology Transfer	83,857	198,185	3,033	0	285,075	83,625	198,185	3,033	0	284,843
% of World	29.42%	69.52%	1.06%	0.0%	100%	29.36%	69.58%	1.06%	0.0%	100%
Training	17,975	38,774	250	0	56,999	18,500	73,474	250	0	92,224
% of World	31.54%	68.03%	0.44%	0.0%	100%	20.06%	79.67%	0.27%	0.0%	100%
Other	85,015	3,500	4,487	9,998	103,000	86,957	3,500	13,370	9,998	113,825
% of World	82.54%	3.40%	4.36%	9.71%	100%	76.40%	3.07%	11.75%	8.78%	100%
Licensed Prod./Assembly	105	0	0	0	105	105	0	0	0	105
% of World	10%	0.0%	0.0%	0.0%	100%	10%	0.0%	0.0%	0.0%	100%
Co-production	0	0	725	0	725	0	0	725	0	725
% of World	0.0%	0.0%	10%	0.0%	100%	0.0%	0.0%	10%	0.0%	100%
Investment	50,617	0	8,638	0	59,255	55,826	0	8,638	0	64,464
% of World	85.42%	0.0%	14.58%	0.0%	100%	86.60%	0.0%	13.40%	0.0%	100%

Source: BXA's Offset Reporting Data

Table 11C. Indirect Offset Transactions by Region, 1995 Subgrouped by Type, in $000s										
	Actual Values					Values Credited Toward Offsets				
Year	1995	1995	1995	1995	1995	1995	1995	1995	1995	1995
Type\Region	Europe	Pacific Rim	Middle East	Other	World Total	Europe	Pacific Rim	Middle East	Other	World Total
Number of Transactions	313	28	13	114	468	313	28	13	114	468
Total	1,209,562	208,882	12,624	179,474	1,610,542	1,394,616	487,527	36,516	174,155	2,092,814
% of World Total	75.10%	12.97%	0.78%	11.14%	100%	66.64%	23.30%	1.74%	8.32%	100%
Purchase	548,390	164,603	12,093	93,726	818,812	606,254	164,603	29,830	86,833	887,520
% of World	66.97%	20.10%	1.48%	11.45%	100%	68.31%	18.55%	3.36%	9.78%	100%
Subcontractor Activity	0	0	0	0	0	0	0	0	0	0
% of World	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Credit Transfer	307,382	0	0	63,355	370,737	350,682	15,000	0	63,355	429,037
% of World	82.91%	0.0%	0.0%	17.09%	100%	81.74%	3.50%	0.0%	14.77%	100%
Technology Transfer	83,155	23,649	0	0	106,804	86,855	42,244	0	0	129,099
% of World	77.86%	22.14%	0.0%	0.0%	100%	67.28%	32.72%	0.0%	0.0%	100%
Training	79,006	930	123	968	81,027	108,503	930	1,867	1,898	113,198
% of World	97.51%	1.15%	0.15%	1.19%	100%	95.85%	0.82%	1.65%	1.68%	100%
Other	86,137	9,050	42	20,781	116,010	136,200	13,000	423	20,781	170,404
% of World	74.25%	7.80%	0.04%	17.91%	100%	79.93%	7.63%	0.25%	12.20%	100%
Licensed Prod./Assembly	0	0	0	0	0	0	0	0	0	0
% of World	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Co-production	0	0	0	0	0	0	0	0	0	0
% of World	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Investment	105,492	10,650	366	644	117,152	106,122	251,750	4,396	1,288	363,556
% of World	90.05%	9.09%	0.31%	0.55%	100%	29.19%	69.25%	1.21%	0.35%	100%

Source: BXA's Offset Reporting Data

Table 12A. Combination (pt. Direct & Indirect) Offset Transactions by Region 1993 Subgrouped by Type, in $000s										
	Actual Values					Values Credited Toward Offsets				
Year	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993
Type\Region	Europe	Pacific Rim	Middle East	Other	World Total	Europe	Pacific Rim	Middle East	Other	World Total
Number of Transactions	4	2	0	2	8	4	2	0	2	8
Total	80,105	13,132	0	32,829	126,065	81,332	16,732	0	32,829	130,893
% of World Total	63.54%	10.42%	0.0%	26.04%	100%	62.14%	12.78%	0.0%	25.08%	100%
Purchase	14,500	0	0	28,600	43,100	14,500	0	0	28,600	43,100
% of World	33.64%	0.0%	0.0%	66.36%	100%	33.64%	0.0%	0.0%	66.36%	100%
Subcontractor Activity	18,000	0	0	0	18,000	18,000	0	0	0	18,000
% of World	10%	0.0%	0.0%	0.0%	100%	10%	0.0%	0.0%	0.0%	100%
Credit Transfer	0	0	0	0	0	0	0	0	0	0
% of World	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Technology Transfer	23,005	0	0	4,229	27,234	24,232	0	0	4,229	28,461
% of World	84.47%	0.0%	0.0%	15.53%	100%	85.14%	0.0%	0.0%	14.86%	100%
Training	0	0	0	0	0	0	0	0	0	0
% of World	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Other	0	0	0	0	0	0	0	0	0	0
% of World	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Licensed Prod./Assembly	0	12,017	0	0	12,017	0	15,617	0	0	15,617
% of World	0.0%	10%	0.0%	0.0%	100%	0.0%	10%	0.0%	0.0%	100%
Co-production	0	1,115	0	0	1,115	0	1,115	0	0	1,115
% of World	0.0%	10%	0.0%	0.0%	100%	0.0%	10%	0.0%	0.0%	100%
Investment	24,600	0	0	0	24,600	24,600	0	0	0	24,600
% of World	100%	0.0%	0.0%	0.0%	100%	100%	0.0%	0.0%	0.0%	100%

Source: BXA's Offset Reporting Data

Table 12B. Combination (pt. Direct & Indirect) Offset Transactions by Region, 1994 Subgrouped by Type, in $000s										
	Actual Values in $000s					Values Credited Toward Offsets in $000s				
Year	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994
Type\Region	Europe	Pacific Rim	Middle East	Other	World Total	Europe	Pacific Rim	Middle East	Other	World Total
Number of Transactions	5	2	0	3	10	5	2	0	3	10
Total	42,660	12,215	0	106,055	160,930	43,560	15,815	0	106,055	165,430
% of World Total	26.51%	7.59%	0.0%	65.90%	100%	26.33%	9.56%	0.0%	64.11%	100%
Purchase	10,960	198	0	35,430	46,588	10,960	198	0	35,430	46,588
% of World	23.53%	0.43%	0.0%	76.05%	100%	23.53%	0.43%	0.0%	76.05%	100%
Subcontractor Activity	0	0	0	10,025	10,025	0	0	0	10,025	10,025
% of World	0.0%	0.0%	0.0%	10%	100%	0.0%	0.0%	0.0%	10%	100%
Credit Transfer	0	0	0	0	0	0	0	0	0	0
% of World	0.0%	0.0%	0.0%	0.0%	00.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Technology Transfer	2,400	0	0	60,600	63,000	2,700	0	0	60,600	63,300
% of World	3.81%	0.0%	0.0%	96.19%	100%	4.27%	0.0%	0.0%	95.73%	100%
Training	0	0	0	0	0	600	0	0	0	600
% of World	0.0%	0.0%	0.0%	0.0%	0.0%	10%	0.0%	0.0%	0.0%	100%
Other	0	0	0	0	0	0	0	0	0	0
% of World	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	00.0%
Licensed Prod./Assembly	0	12,017	0	0	12,017	0	15,617	0	0	15,617
% of World	0.0%	10%	0.0%	0.0%	100%	%	10.0%	0.0%	0.0%	100%
Co-production	0	0	0	0	0	0	0	0	0	0
% of World	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Investment	29,300	0	0	0	29,300	29,300	0	0	0	29,300
% of World	100%	0.0%	0.0%	0.0%	100%	100%	0.0%	0.0%	0.0%	100%

Source: BXA’s Offset Reporting Data

2.2.3.5 Offsets by Major Industrial Segment: Moving away from regional analyses, *Table 13* presents data for 1993-1995 for the aerospace/non-aerospace and manufacturing/non-manufacturing industrial segments to highlight the role of these segments in offset transactions. For the purpose of this report, aerospace includes some aerospace-dedicated management, educational, service, and component industries such as avionics or instrumentation that are included in industry classifications outside the traditional aerospace SIC codes, but are integral to the production or operation and maintenance of aerospace products.

During 1993-1995, aerospace-related transactions represented 49 percent of the total value, and 46 percent of the total number, of actual offset transactions, and 50 percent of the value credited toward offsets. The credited values averaged about 23 percent more than the actual transaction values for aerospace classifications and 18 percent for non-aerospace classifications. More than 59 percent of the aerospace transactions are direct. In contrast, over 89 percent of the non-aerospace offset transactions are indirect, while only slightly more than 10 percent are direct. The aerospace segment represented about 85 percent of the actual value of all direct offset transactions and 93 percent of combination offsets. However, the non-aerospace segment dominated indirect transactions, with 74 percent of the total value.

In reviewing the same totals in terms of manufacturing/non-manufacturing, manufacturing is dominant, both in terms of the number of transactions and in terms of actual and credited values. Manufacturing transactions accounted for 86 percent (1,454 of 1,681) of the total number of transactions and 81 percent of the value. Further, these transactions made up 90 percent of the value of direct transactions, 74 percent of the value of indirect transactions, and all of the value of combination offset transactions. Indirect offsets made up the largest percentage in the non-manufacturing sector, with 82 percent of total non-manufacturing offsets; these indirect offsets accounted for 26 percent of all indirect offsets (manufacturing and non-manufacturing).

Table 13. Offset Transactions by Major Industry Sector, 1993-1995 Subgrouped as Direct, Indirect and Combination (Both), in $000s							
Major Industry Sector	# of Trans.	Actual Value of Offset Transactions			Values Credited Toward Offsets		
		Value in $000s	% of Sector	% of Total	Value in $000s	% of Sector	% of Total
Total Offsets - All Segments	1681	6,508,875		100.00%	7,771,254		100.00%
Aerospace - Total Offsets	774	3,206,591	100.00%	49.26%	3,890,753	100.00%	50.07%
Aerospace - Direct	407	1,907,490	59.49%	29.31%	2,270,353	58.35%	29.21%
Aerospace - Indirect	351	1,031,221	32.16%	15.84%	1,343,191	34.52%	17.28%
Aerospace - Both	16	267,881	8.35%	4.12%	277,208	7.12%	3.57%
Non-Aerospace -Total	907	3,302,284	100.00%	50.74%	3,880,501	100.00%	49.93%
Non-Aerospace - Direct	83	339,042	10.27%	5.21%	444,142	11.45%	5.72%
Non-Aerospace - Indirect	822	2,944,127	89.15%	45.23%	3,417,244	88.06%	43.97%
Non-Aerospace - Both	2	19,115	0.58%	0.29%	19,115	0.49%	0.25%
Manufacturing - Total Offsets	1454	5,252,709	100.00%	80.70%	6,316,486	100.00%	81.28%
Manufacturing - Direct	465	2,025,373	38.56%	31.12%	2,436,808	38.58%	31.36%
Manufacturing - Indirect	971	2,940,340	55.98%	45.17%	3,583,355	56.73%	46.11%
Manufacturing - Both	18	286,996	5.46%	4.41%	296,323	4.69%	3.81%
Non-Manufacturing - Total	227	1,256,166	100.00%	19.30%	1,454,768	100.00%	18.72%
Non-Manufacturing - Direct	25	221,158	17.61%	3.40%	277,687	19.09%	3.57%
Non-Manufacturing - Indirect	202	1,035,008	82.39%	15.90%	1,177,081	80.91%	15.15%
Non-Manufacturing - Both	0	-	-	-	-	-	-

Source: BXA's Offset Reporting Data

The next two tables show the data in *Table 13* in greater detail. *Table 14A* presents aerospace and non-aerospace offset transactions, both by type and by category. While aerospace offsets were distributed among all three categories ― 59 percent were direct, 32 percent indirect and eight percent combination ― over 89 percent of non-aerospace offsets were indirect. Purchases comprised the largest portion of offset transactions for non-aerospace with 39 percent of the total. Subcontractor activity was the leader for the aerospace sector with 34 percent, possibly indicating an interest on the part of buyer countries in developing subcontractor's capabilities in this industry.

Aerospace transactions were considerably larger than non-aerospace in every direct type category. Non-aerospace was dominant in indirect offsets, leading by large amounts in every category except technology transfer. Co-production and licensed assembly dominated direct transactions in both aerospace and non-aerospace categories.

Table 14B shows offset transactions by manufacturing and non-manufacturing segments. The only categories where non-manufacturing offsets were greater than the comparable manufacturing offsets were credit transfer and training, which were the two largest categories in value for non-manufacturing. The third largest non-manufacturing offset type was purchases with 15 percent of the value of non-manufacturing offsets. Over 65 percent of manufacturing offsets came from purchase and subcontractor activity transactions alone. Technology transfer held the next largest share with 13 percent of total manufacturing offsets.

Table 14A. Offset Transactions by Aerospace and Non-Aerospace Sectors, 1993-1995
Subgrouped as Direct, Indirect and Combination (Both)

Type Offset	Aerospace						
	Direct		Indirect		Combination		Total
	Value in $000s	% of Total	Value in $000s	% of Total	Value in $000s	% of Total	Value in $000s
# of Transactions	407	52.58%	351	45.35%	16	2.07%	774
Actual Value - Total	1,907,490	59.49%	1,031,221	32.16%	267,881	8.35%	3,206,591
Purchase	190,383	24.22%	505,914	64.37%	89,688	11.41%	785,985
Subcontractor Activity	976,668	89.85%	100,257	9.22%	10,025	0.92%	1,086,950
Credit Transfer	3,511	14.38%	20,900	85.62%	0	0.00%	24,411
Technology Transfer	256,239	41.21%	275,345	44.28%	90,234	14.51%	621,817
Training	197,667	79.14%	52,105	20.86%	0	0.00%	249,772
Other	39,750	36.95%	67,825	63.05%	0	0.00%	107,575
Licensed Prod./Ass'bly	61,246	71.82%	0	0.00%	24,034	28.18%	85,280
Co-production	178,177	99.59%	725	0.41%	0	0.00%	178,902
Investment	3,850	5.84%	8,150	12.37%	53,900	81.79%	65,900
Type Offset	Non-Aerospace						
	Direct		Indirect		Combination		Total
	Value in $000s	% of Total	Value in $000s	% of Total	Value in $000s	% of Total	Value in $000s
# of Transactions	83	9.15%	822	90.63%	2	0.22%	907
Actual Value - Total	339,042	10.27%	2,944,127	89.15%	19,115	0.58%	3,302,284
Purchase	7,314	0.56%	1,293,054	99.44%	0	0.00%	1,300,368
Subcontractor Activity	172,052	36.35%	283,250	59.85%	18,000	3.80%	473,303
Credit Transfer	494	0.08%	631,058	99.92%	0	0.00%	631,552
Technology Transfer	33,318	13.83%	207,665	86.17%	0	0.00%	240,983
Training	41,237	31.53%	89,543	68.47%	0	0.00%	130,780
Other	28,311	9.77%	261,437	90.23%	0	0.00%	289,748
Licensed Prod./Ass'bly	3,000	96.62%	105	3.38%	0	0.00%	3,105
Co-production	53,315	97.95%	0	0.00%	1,115	2.05%	54,430
Investment	0	0.00%	178,015	100.00%	0	0.00%	178,015

Source: BXA's Offset Reporting Data

Table 14B. Offset Transactions by Manufacturing and Non-Manufacturing Sectors, 1993-1995 Subgrouped as Direct, Indirect and Combination (Both)

Type Offset	Manufacturing						
	Direct		Indirect		Combination		Total
	Value in $000s	% of Total	Value in $000s	% of Total	Value in $000s	% of Total	Value in $000s
# of Transactions	465	31.98%	971	66.78%	18	1.24%	1,454
Actual Value - Total	2,025,373	38.56%	2,940,340	55.98%	286,996	5.46%	5,252,709
Purchase	194,417	10.26%	1,610,213	85.00%	89,688	4.73%	1,894,318
Subcontractor Activity	1,129,002	73.79%	373,024	24.38%	28,025	1.83%	1,530,051
Credit Transfer	0	0.00%	272,587	100.00%	0	0.00%	272,587
Technology Transfer	248,451	35.05%	370,101	52.22%	90,234	12.73%	708,785
Training	87,182	63.66%	49,758	36.34%	0	0.00%	136,940
Other	66,733	27.57%	175,300	72.43%	0	0.00%	242,033
Licensed Prod./Ass'bly	64,246	72.69%	105	0.12%	24,034	27.19%	88,385
Co-production	231,492	99.21%	725	0.31%	1,115	0.48%	233,332
Investment	3,850	2.63%	88,528	60.52%	53,900	36.85%	146,278
Type Offset	Non-Manufacturing						
	Direct		Indirect		Combination		Total
	Value in $000s	% of Total	Value in $000s	% of Total	Value in $000s	% of Total	Value in $000s
# of Transactions	25	11.01%	202	88.99%	0	0.00%	227
Actual Value -Total	221,158	17.61%	1,035,008	82.39%	0	0.00%	1,256,166
Purchase	3,280	1.71%	188,755	98.29%	0	0.00%	192,035
Subcontractor Activity	19,718	65.29%	10,483	34.71%	0	0.00%	30,201
Credit Transfer	4,004	1.04%	379,371	98.96%	0	0.00%	383,375
Technology Transfer	41,106	26.69%	112,909	73.31%	0	0.00%	154,015
Training	151,722	62.28%	91,890	37.72%	0	0.00%	243,612
Other	1,328	0.86%	153,962	99.14%	0	0.00%	155,290
Licensed Prod./Ass'bly	0	0.00%	0	0.00%	0	0.00%	0
Co-production	0	0.00%	0	0.00%	0	0.00%	0
Investment	0	0.00%	97,637	100.00%	0	0.00%	97,637

Source: BXA's Offset Reporting Data

2.2.3.6 Offset Transactions by Standard Industrial Classification (SIC) Notation: *Table 15* displays offset transactions identified to 38 major groups (two-digit SIC codes) that cut across the entire economy. The 38 major groups reflect all 1,681 transactions and total slightly over $6.5 billion dollars for the three years (1993-1995). Last year's report, which did not include the 671 new transactions reported in 1995, identified 29 major groups, and reflected 1,010 transactions valued at $3.83 billion. (*Table 15* is comparable to *Table 25* in last year's report.) The values shown are actual values in thousands of dollars for direct, indirect, and combination transactions, along with the total number of transactions reported for each major group. Again, no combination offsets were reported in 1995.

Table 15 clearly shows the high concentration of offset transactions in major groups 35, 36, and 37, which together account for 74 percent of the value of all transactions. Group 37 - Transportation Equipment alone accounts for 51 percent of all transactions. On the low side, 10 major groups are represented by only one transaction, in each case an indirect offset. Notably, in only four major groups did the value of direct offsets exceed that of indirect transactions. These were: group 27 - Printing and Publishing; group 37 - Transportation Equipment; group 38 - Measuring and Analyzing Instruments; and group 82 - Educational Services.

As before, indirect offsets remain more widely dispersed than direct, and show representation in all 38 groups; direct offsets are shown in 11 major groups, and combination offsets appear in only two. Direct transactions, as expected, are clustered in the traditional defense areas, especially group 37, which includes most of the aerospace items. In fact, group 37 accounts for 71 percent of all direct transactions. Comparatively, group 37 accounts for about 36 percent of the indirect offsets. In contrast, group 35 - Industrial Machinery, composed primarily of commercial products, accounts for only 1 percent of the total dollar value of direct transactions. However, it accounts for almost 16 percent of indirect transactions.

It is interesting to note the difference between the average transaction values for direct and indirect transactions. The average direct transaction in 1995 was $5.24 million vs. $3.44 million for indirect. The three-year average value, which was not quite as skewed, was $4.58 million for direct and $3.39 million for indirect. This suggests that the direct offsets may be more focused on individual firms and easier for the American prime to consolidate and economize values. In contrast, indirect offsets would be less targeted, and require a greater marketing effort by the prime. In fact, the calculated average indirect offset value is actually overstated because the recipient for about 20 large indirect transactions was reported as "various", "unknown", or

Table 15. Offset Transactions by Major Group, 1993-1995 for Direct, Indirect, and Combination									
SIC Code	Industry Sector	# of Transactions				Actual Values in $000s			
		Total	D	I	B	Total	Direct	Indirect	Both
7	Agricultural Services	1	0	1	0	42	0	42	0
13	Oil and Gas Extraction	1	0	1	0	10,000	0	10,000	0
14	Mining	1	0	1	0	3,244	0	3,244	0
15	General Contractors	7	3	4	0	17,519	7,062	10,457	0
16	Heavy Contractors	1	0	1	0	260	0	260	0
17	Construction - Specialty Trades	1	0	1	0	3,874	0	3,874	0
20	Food and Kindred Products	28	0	28	0	15,466	0	15,466	0
22	Textile Mill Products	2	0	2	0	6,067	0	6,067	0
23	Apparel & Other Finished Products	9	0	9	0	3,518	0	3,518	0
26	Paper Mills & Allied Products	4	0	4	0	15,862	0	15,862	0
27	Printing and Publishing	4	2	2	0	23,472	18,631	4,841	0
28	Chemicals	29	0	29	0	78,408	0	78,408	0
30	Rubber & Misc. Plastics Products	2	0	2	0	2,946	0	2,946	0
32	Stone, Clay & Glass Products	5	0	5	0	1,634	0	1,634	0
33	Primary Metal Industries	34	0	34	0	45,029	0	45,029	0
34	Fabricated Metal Products	50	14	36	0	150,589	27,425	123,164	0
35	Industrial Machinery	223	6	217	0	649,450	22,500	626,950	0
36	Electronic/Electrical Equipment	290	81	207	2	831,038	287,404	538,290	5,344
37	Transportation Equipment	733	347	370	16	3,310,540	1,595,415	1,433,473	281,652
38	Measuring, Analyzing Instruments	39	15	24	0	113,592	73,999	39,593	0
39	Misc. Manufacturing Industries	2	0	2	0	5,100	0	5,100	0
42	Motor Freight Trans. & Warehousing	1	0	1	0	1,451	0	1,451	0
44	Water Transportation	1	0	1	0	5,208	0	5,208	0
47	Transportation Services	2	0	2	0	2,764	0	2,764	0
48	Communications	3	0	3	0	18,751	0	18,751	0
49	Electric, Gas, and Sanitary Services	1	0	1	0	786	0	786	0
50	Wholesale Trade - Durables	12	0	12	0	78,800	0	78,800	0
51	Wholesale Trade - Non-Durables	7	0	7	0	822	0	822	0
61	Nondepository Credit Institutions	25	7	18	0	390,013	7,612	382,401	0
67	Holding/Investment Offices	29	0	29	0	100,127	0	100,127	0
73	Business Services	45	5	40	0	99,549	29,600	69,949	0
76	Misc. Repair Services	3	0	3	0	3,473	0	3,473	0
80	Health Services	1	0	1	0	28	0	28	0
81	Legal Services	1	0	1	0	75	0	75	0
82	Educational Services	20	6	14	0	225,585	132,962	92,623	0
87	Technical Services	48	4	44	0	235,060	43,922	191,138	0
89	Misc. Services	2	0	2	0	6,000	0	6,000	0
99	Undetermined Services	14	0	14	0	52,735	0	52,735	0
Total	All Industries	1,681	490	1,173	18	6,508,877	2,246,532	3,975,349	286,996

Source: BXA's Offset Reporting Data

"many." The number of indirect transactions would of course rise if these were reported separately and lower the average, possibly by a large amount.

Table 16 repeats the same 38 major groups presented in *Table 15*, but display the data by region in which the offset transactions took place instead of by direct or indirect offsets. (*Table 16* is comparable to *Table 26* in last year's report.) Europe continues to receive by far both the widest array of transactions and the lion's share in dollar terms. Last year's study showed that European nations represented over 69 percent of total transaction values for 1993-1994. For 1993-1995, the European share rose slightly to 70 percent. The region represented as "Other" on the table, which includes Australia, Canada, Israel, and New Zealand, rose from 13 percent for the two years to 15 percent for the three years, and jumped past the Pacific Rim nations into second place behind Europe.

Europe is represented in 35 of the 38 Industry Groups. The Pacific Rim has transactions in eight sectors, with value predominantly in Major Groups 35, 36, and 37, while the Middle East has transactions in 15 Major Groups. However, the Middle East had the lowest value of offset transactions of any region. The Other Areas reported transactions in 14 Major Groups, with most of the value in Groups 36 and 37.

Group 37 - Transportation Equipment was the largest single category by value for each region. On a percentage basis, Group 37 represented 44.9 percent of the value of offset transactions with Europe, 68.9 percent of the value of transactions with the Pacific Rim, 42.9 percent of the value of transactions for the Middle East, and 63.5 percent of the offset transaction value for Other Areas. Major Group 36 - Electronic/Electrical Equipment was the second largest in Europe, the Pacific Rim, and Other Areas. Group 35 - Industrial Machinery was third in Europe and the Pacific Rim.

Table 17 lists all reported industries by SIC Code, industry description, and the number and actual value of transactions reported for 1993-1995. In total, 172 industries were identified for 1,681 transactions; this is 45 industries more than reported last year for 1993-1994. (*Table 17* corresponds to *Table 27* in last year's report.)

Table 16. Offset Transactions by Major Group and Region, 1993-1995						
SIC Code	Industry Sector	Actual Values in $000s				
		Total	Europe	Pacific Rim	Middle East	Other
7	Agricultural Services	42	0	0	42	0
13	Oil and Gas Extraction	10,000	10,000	0	0	0
14	Mining	3,244	3,244	0	0	0
15	General Contractors	17,519	10,407	0	50	7,062
16	Heavy Contractors	260	260	0	0	0
17	Construction - Specialty Trades	3,874	3,874	0	0	0
20	Food and Kindred Products	15,466	15,466	0	0	0
22	Textile Mill Products	6,067	6,067	0	0	0
23	Apparel & Other Finished Products	3,518	3,518	0	0	0
26	Paper Mills & Allied Products	15,862	15,862	0	0	0
27	Printing and Publishing	23,472	19,761	0	0	3,711
28	Chemicals	78,408	61,610	0	9,522	7,276
30	Rubber & Misc. Plastics Products	2,946	2,946	0	0	0
32	Stone, Clay & Glass Products	1,634	1,634	0	0	0
33	Primary Metal Industries	45,029	30,449	3,191	11,389	0
34	Fabricated Metal Products	150,589	91,219	1,826	17,833	39,711
35	Industrial Machinery	649,449	542,980	88,298	496	17,675
36	Electronic/Electrical Equipment	831,037	564,147	102,433	13,437	151,020
37	Transportation Equipment	3,310,541	2,044,598	591,354	48,380	626,209
38	Measuring, Analyzing Instruments	113,592	55,245	0	400	57,947
39	Misc. Manufacturing Industries	5,100	5,100	0	0	0
42	Motor Freight Trans. & Warehousing	1,451	1,451	0	0	0
44	Water Transportation	5,208	5,208	0	0	0
47	Transportation Services	2,764	2,500	0	0	264
48	Communications	18,751	18,751	0	0	0
49	Electric, Gas, and Sanitary Services	786	786	0	0	0
50	Wholesale Trade - Durables	78,800	78,800	0	0	0
51	Wholesale Trade - Non-Durables	822	822	0	0	0
61	Nondepository Credit Institutions	390,013	325,330	0	0	64,683
67	Holding/Investment Offices	100,127	90,479	0	9,004	644
73	Business Services	99,548	95,751	0	711	3,086
76	Misc. Repair Services	3,473	3,473	0	0	0
80	Health Services	28	0	0	28	0
81	Legal Services	75	0	0	75	0
82	Educational Services	225,585	193,683	28,362	290	3,250
87	Technical Services	235,060	202,839	28,050	987	3,184
89	Misc. Services	6,000	6,000	0	0	0
99	Undetermined Services	52,735	37,735	15,000	0	0
Total	All Industries	6,508,875	4,551,995	858,514	112,644	985,722

Source: BXA's Offset Reporting Data

In *Table 17*, the level of specificity by SIC Code varies: this industry data is presented to the greatest level of detail provided by industry respondents. In most cases, the data is at the 4-digit industry level. In other cases, however, only the 3-digit or 2-digit levels were obtainable, based on the reported information. For example, some reports simply listed "machinery", which could not be further refined beyond its 2-digit major group (35 - industrial machinery). As a result, the data does not overlap.

In selected cases an item was clearly destined for aerospace end markets, but was reported in a non-aerospace SIC Code. These industries were prefaced with the word "aerospace" in their descriptions. As can be surmised, the determination of SIC Codes for each reported transaction was in many cases difficult, in large part because SIC Codes were not generally reported. The resulting large number in basket category 2- and 3-digit listings, therefore, significantly understates the total range of 4-digit SICs that were actually involved in these offset transactions. Also, many of the listed 4-digit industries may be understated due to these aggregations. For example, if greater detail were available, some of the transactions now shown in group 35 - Industrial Machinery (87 transactions valued at $241.4 million) would fall into SIC 3541 - Metal Cutting Machine Tools, increasing the value in that industry.

The accumulated percentage column highlights the dominance of major groups 35, 36, and 37, already shown in *Table 15* and *Table 16*. For example, these groups include 73.6 percent of the value (i.e., SIC 376 at 79.4 percent minus SIC 3499 at 5.8 percent = 73.6 percent) and 1,246 of the 1,681 transactions. The value for the top 14 SIC lines are each above 1 percent of the total. The remaining 158 line items are all less than 1 percent, indicating a very skewed distribution. In fact, 64 of the line items involved only one transaction. Moreover, 106 line items were each valued at less than 0.1 percent of the total. Conversely, only 22 line items involved 10 or more transactions.

The top 14 SIC line items on *Table 17* combine to total 1,119 transactions valued at $4.93 billion, almost 76 percent of the grand total. The single largest line item is Major Industry 372 - Aircraft and Parts, with 495 transactions valued at $2.21 billion (34 percent of total). Other major line items are SIC 367 - Electronic Components, 193 transactions valued at $514 million (7.9 percent of total), SIC 3728 - Aircraft Parts, 166 transactions valued at $488 million (7.5 percent of total), and SIC 61 - Banked Credit, 43 transactions valued at $390 million (6 percent

Table 17. Offset Transactions by Detailed Industry					
SIC Code	Industry Description	# of Trans.	Value (actual)	Percent	Accum. Percent
721	Crop Planting and Cultivating	1	42,000	0.0006	0.0006
1311	Crude Petroleum and Natural Gas	1	10,000,000	0.1536	0.1542
14	Mining	1	3,244,000	0.0498	0.2040
15	Building Construction	4	14,862,000	0.2283	0.4323
1521	General Contractors, Family Houses	2	870,000	0.0134	0.4457
1541	General Contractors, Industrial	1	1,787,000	0.0275	0.4732
16	Heavy Construction	1	259,867	0.0040	0.4772
1761	Roofing, Siding, & Sheet Metal Work	1	3,874,000	0.0595	0.5367
20	Food and Kindred Products	14	9,556,000	0.1468	0.6835
2033	Canned Fruits and Vegetables	2	2,145,000	0.0330	0.7165
2079	Shortening and Oils	3	1,068,000	0.0164	0.7329
2084	Wine, Brandy, and Brandy Spirits	9	2,697,000	0.0414	0.7743
22	Textile Mill Products	2	6,067,000	0.0932	0.8675
23	Apparel & Other Finished Products	9	3,518,418	0.0541	0.9216
2621	Paper Mills	2	2,881,000	0.0443	0.9659
2671	Packaging Paper	1	5,981,000	0.0919	1.0578
2672	Coated and Laminated Paper	1	7,000,000	0.1075	1.1653
27	Printing	1	1,761,000	0.0271	1.1924
2741	Aerospace (Miscellaneous Publishing)	1	18,000,000	0.2765	1.4689
2741	Miscellaneous Publishing	2	3,711,000	0.0570	1.5259
28	Chemicals and Allied Products	14	33,149,231	0.5093	2.0352
28	Petrochemicals	6	14,864,000	0.2284	2.2636
282	Plastics	1	3,863,000	0.0593	2.3229
2834	Pharmaceutical Preparations	2	188,000	0.0029	2.3258
286	Industrial Chemicals	3	12,835,000	0.1972	2.5230
2865	Cyclic Organic, Crude/Intermediate	1	2,470,000	0.0379	2.5609
2892	Explosives	1	2,438,447	0.0375	2.5984
2895	Carbon Black	1	8,600,000	0.1321	2.7305
3053	Gaskets, Packing & Sealing Devices	2	2,946,000	0.0453	2.7758
3281	Cut Stone and Stone Products	4	1,164,000	0.0179	2.7937
3291	Abrasive Products	1	470,000	0.0072	2.8009
33	Primary Metal Industries	5	6,795,000	0.1044	2.9053
331	Steel Works	1	4,600,000	0.0707	2.9760
3312	Steel Blast Furnaces and Mills	8	18,966,900	0.2914	3.2674
3315	Steel Wiredrawing	1	1,091,000	0.0168	3.2842
332	Iron and Steel Foundries	2	2,100,000	0.0323	3.3165
3334	Primary Aluminum	8	3,070,261	0.0472	3.3637
3339	Primary Metal, except Aluminum & Copper	3	3,671,000	0.0564	3.4201
3351	Copper Drawing and Extruding	6	4,735,000	0.0727	3.4928

Table 17 (continued). Offset Transactions by Detailed Industry					
SIC Code	Industry Description	# of Trans.	Value (actual)	Percent	Accum. Percent
34	Aerospace (Fabricated Metal Products)	1	3,817,000	0.0586	3.5514
34	Fabricated Metal Products	8	53,648,000	0.8242	4.3756
3441	Fabricated Structural Metal	1	319,000	0.0049	4.3805
3443	Fabricated Plate Work	4	5,961,000	0.0916	4.4721
3444	Sheet Metal Work	4	3,851,000	0.0592	4.5313
3452	Industrial Fasteners	1	704,000	0.0108	4.5421
3462	Iron and Steel Forgings	8	10,105,120	0.1553	4.6974
3463	Aerospace (Nonferrous Forgings)	2	2,849,000	0.0438	4.7412
3471	Electroplating, Plating, etc.	1	378,000	0.0058	4.7470
3479	Coating, Engraving, & Allied Services	1	2,053,000	0.0315	4.7785
348	Ordnance and Accessories	13	38,782,429	0.5958	5.3743
3489	Ordnance and Accessories, NEC	3	21,197,000	0.3257	5.7000
349	Valves	2	1,722,000	0.0265	5.7265
3499	Metal Fabrication, NEC	1	5,202,000	0.0799	5.8064
35	Industrial Machinery	87	241,438,252	3.7094	9.5158
3519	Internal Combustion Engines	2	49,702,000	0.7636	10.2794
3523	Farm Machinery	1	218,000	0.0033	10.2827
3531	Construction Machinery	1	255,000	0.0039	10.2866
3532	Mining Machinery	7	14,199,000	0.2181	10.5047
3535	Conveyors and Conveying Equipment	4	3,205,000	0.0492	10.5539
3537	Industrial Trucks, Tractors, etc.	3	17,188,000	0.2641	10.8180
3541	Metal Cutting Machine Tools	25	107,852,300	1.6570	12.4750
3542	Metal Forming Machine Tools	9	5,081,000	0.0781	12.5531
3544	Special Dies and Tooling	5	3,995,963	0.0614	12.6145
3545	Metal Cutting Tools & Accessories	3	2,238,000	0.0344	12.6489
3547	Rolling Mill Machinery and Equipment	1	828,000	0.0127	12.6616
3548	Welding Equipment	5	13,413,000	0.2061	12.8677
3549	Metalworking Machinery, NEC	1	2,200,000	0.0338	12.9015
3552	Textile Machinery	3	21,764,000	0.3344	13.2359
3553	Woodworking Machinery	2	605,000	0.0093	13.2452
3554	Paper Industries Machinery	9	25,158,000	0.3865	13.6317
3555	Printing Trades Machinery	2	7,830,000	0.1203	13.7520
3559	Special Industry Machinery, NEC	2	6,417,000	0.0986	13.8506
3562	Ball and Roller Bearings	1	447,000	0.0069	13.8575
3563	Air and Gas Compressors	4	13,320,000	0.2046	14.0621
3564	Industrial Fans and Blowers	1	268,000	0.0041	14.0662
3565	Packaging Machinery	1	190,000	0.0029	14.0691
3566	Speed Changers and Gears	1	402,000	0.0062	14.0753
3567	Industrial Furnaces & Ovens	2	35,208,000	0.5409	14.6162

Table 17 (continued). Offset Transactions by Detailed Industry					
SIC Code	Industry Description	# of Trans.	Value (actual)	Percent	Accum. Percent
3569	General Industrial Machinery	5	2,694,335	0.0414	14.6576
357	Computer Hardware	24	58,242,461	0.8948	15.5524
3571	Electronic Computers	3	3,163,102	0.0486	15.6010
3575	Computer Terminals	1	2,338,000	0.0359	15.6369
3577	Computer Printers	2	148,000	0.0023	15.6392
3589	Service Industry Machinery	2	4,202,000	0.0646	15.7038
3599	Other Industrial Equipment (Filters)	4	5,239,000	0.0805	15.7843
36	Aerospace (Electronic, Other Electrical)	2	3,293,000	0.0506	15.8349
36	Electronic & Other Electrical Equipment	32	107,031,183	1.6444	17.4793
3612	Power, Distribution Transformers	1	361,000	0.0055	17.4848
3613	Switchgear, Switchboard Apparatus	2	559,000	0.0086	17.4934
3621	Electric Motors and Generators	4	2,320,000	0.0356	17.5290
3625	Relays and Industrial Controls	3	1,727,000	0.0265	17.5555
3632	Household Refrigerators	2	2,000,000	0.0307	17.5862
3639	Household Appliances, NEC	1	22,000,000	0.3380	17.9242
364	Electrical Lighting & Wiring Equipment	3	2,733,000	0.0420	17.9662
366	Aerospace (Telecommunications Equipment)	4	5,838,800	0.0897	18.0559
366	Telecommunications Equipment	23	118,240,352	1.8166	19.8725
3661	Telephone Systems	4	11,500,000	0.1767	20.0492
3663	Aerospace (Radio, TV Broadcasting)	1	2,850,000	0.0438	20.0930
3663	Radio & TV Broadcasting Equipment	2	267,000	0.0041	20.0971
3669	Other Communications Equipment	1	1,007,000	0.0155	20.1126
367	Aerospace (Electronics)	26	48,011,162	0.7376	20.8502
367	Electronics	167	465,722,485	7.1552	28.0054
3672	Electronic Circuit Boards	1	723,000	0.0111	28.0165
3674	Semiconductors and Related Devices	1	28,500,000	0.4379	28.4544
3678	Electronic Connectors	1	930,000	0.0143	28.4687
3679	Electronic Components, NEC	2	1,336,400	0.0205	28.4892
369	Batteries	1	400,000	0.0061	28.4953
3699	Aerospace (Electrical Mach., NEC)	1	359,000	0.0055	28.5008
3699	Electrical Machinery & Equipment, NEC	5	3,328,000	0.0511	28.5519
371	Automotive	8	25,745,625	0.3955	28.9474
3711	Aerospace (Automotive Assembly)	1	300,000	0.0046	28.9520
3711	Automotive Assembly	2	94,998,000	1.4595	30.4115
3714	Motor Vehicle Parts & Accessories	17	41,439,624	0.6367	31.0482
372	Aerospace (Aircraft and Parts)	495	2,212,494,479	33.9920	65.0402
3721	Aerospace (Aircraft)	6	28,653,488	0.4402	65.4804
3724	Aerospace (Aircraft Engines & Parts)	17	57,110,000	0.8774	66.3578

3728	Aerospace (Aircraft Parts)	166	488,115,864	7.4992	73.8570

Table 17 (continued). Offset Transactions by Detailed Industry

SIC Code	Industry Description	# of Trans.	Value (actual)	Percent	Accum. Percent
3731	Ship Building and Repairing	20	346,683,000	5.3263	79.1833
376	Aerospace (Missiles & Space Vehicles)	1	15,000,000	0.2305	79.4138
38	Instrumentation (Test Equipment)	1	627,500	0.0096	79.4234
3812	Aerospace (Navigation Equipment)	14	42,384,000	0.6512	80.0746
3823	Industrial Process Controllers	1	846,000	0.0130	80.0876
3827	Aerospace (Optical Instruments)	2	16,500,000	0.2535	80.3411
384	Medical Instruments and Equipment	6	36,983,000	0.5682	80.9093
3841	Surgical Instruments	1	467,000	0.0072	80.9165
3842	Medical Equipment and Supplies	8	2,573,000	0.0395	80.9560
3844	X-Ray Equipment	3	10,000,000	0.1536	81.1096
3873	Watches, Clocks, Timing Devices	3	3,211,000	0.0493	81.1589
3944	Games, Toys, Children's Vehicles	1	4,500,000	0.0691	81.2280
3999	Manufacturing Industries, NEC	1	600,000	0.0092	81.2372
422	Public Warehousing and Storage	1	1,451,000	0.0223	81.2595
4412	Ocean Freight Shipping	1	5,208,237	0.0800	81.3395
47	Transportation Services	1	264,233	0.0041	81.3436
472	Tourist Transportation Services	1	2,500,000	0.0384	81.3820
48	Communications	1	1,344,000	0.0206	81.4026
481	Telephone Communications	2	17,407,000	0.2674	81.6700
4941	Water Supply	1	786,000	0.0121	81.6821
50	Wholesale Trade - Durables	2	8,574,000	0.1317	81.8138
5047	Wholesale Trade - Medical Eqmt	2	59,128,000	0.9084	82.7222
5051	Wholesale Trade - Metals	7	10,660,000	0.1638	82.8860
5084	Wholesale Trade - Industrial Machinery	1	438,000	0.0067	82.8927
5122	Wholesale Trade - Pharmaceuticals	2	2,993,000	0.0460	82.9387
5169	Wholesale Trade - Chemicals (accounting correction)	5	(2,171,000)	-0.0334	82.9053
61	Aerospace (Banked Credit)	4	4,838,504	0.0743	82.9796
61	Banked Credit	21	385,174,923	5.9177	88.8973
67	Holding/Investment Offices	22	73,913,000	1.1356	90.0329
672	Investment Offices	1	3,000,000	0.0461	90.0790
6799	Venture Capital	6	23,214,000	0.3567	90.4357
73	Business Services	3	7,667,000	0.1178	90.5535
7359	Equipment Rental and Leasing, NEC	1	522,000	0.0080	90.5615
737	Software and Data Processing	36	87,284,749	1.3410	91.9025
7373	Computer Integrated Systems Design	2	2,900,000	0.0446	91.9471
7389	Other Business Services	3	1,175,000	0.0181	91.9652
769	Miscellaneous Repair Shops	1	690,000	0.0106	91.9758

7699	Repair Shops and Services, NEC	2	2,783,000	0.0428	92.0186
8099	Health and Allied Services, NEC	1	28,000	0.0004	92.0190

Table 17 (continued). Offset Transactions by Detailed Industry

SIC Code	Industry Description	# of Trans.	Value (actual)	Percent	Accum. Percent
8111	Legal Services	1	75,000	0.0012	92.0202
82	Aerospace (Educational Services)	2	117,406,000	1.8038	93.8240
82	Educational Services	9	35,561,000	0.5463	94.3703
8221	College and University Education	1	250,000	0.0038	94.3741
8299	Aerospace (School and Educational)	4	15,556,000	0.2390	94.6131
8299	Schools and Educational Services, NEC	4	56,812,000	0.8728	95.4859
8711	Aerospace (Engineering Services)	3	43,450,000	0.6676	96.1535
8711	Engineering Services	1	28,000,000	0.4302	96.5837
8731	Commercial Research, Physical Sciences	8	14,300,000	0.2197	96.8034
8732	Commercial Research, Social Sciences	1	6,250,000	0.0960	96.8994
8741	Management Services (Administration)	3	2,537,000	0.0390	96.9384
8742	Aerospace (Management Consulting)	21	79,765,000	1.2255	98.1639
8742	Management Consulting Services	10	59,699,949	0.9172	99.0811
8748	Business Consulting, Other	1	1,058,000	0.0163	99.0974
89	Services, NEC	2	6,000,000	0.0922	99.1896
99	Undetermined	14	52,734,664	0.8102	99.9998
	Total	1681	6,508,875,307		99.9998

Source: BXA's Offset Reporting Data

of total). Note that if enough information were provided, Major Industry 372 would be properly broken into its 4-digit component industries; it is likely that Aircraft Parts (SIC 3728) would be the single largest line item. Note also the negative total value for SIC 5169; one firm submitted several corrections to its previous reporting to balance their records.

2.2.3.7 Sector Breakout — The Effects of Offsets on the Machine Tool Industry: Until the early 1980s, the U.S. machine tool industry was the world leader. However, this changed as Japanese, German and other machine tool builders gained global market share, and captured large portions of the American market. The U.S. industry appears to have stabilized, although at a much lower level, in the 1990s. In 1995, the U.S. ranked first among nations in the consumption of machine tools ($6.7 billion), but third in production ($4.5 billion). The U.S. machine tool trade deficit in 1995 was $2.25 billion.

Table 18. Machine Tool Profile by Country - 1995
U.S. $-millions

Country	Production	Consumption	Trade Balance
Japan	9,001	3,021	5,980
Germany	7,251	4,477	2,774
United States.	4,467	6,717	-2,249
Italy	3,278	2,686	591
Switzerland	2,141	717	1,424

Source: Gardner Publications, Inc.

Machine tools are one of the most essential products supporting modern advanced economies in terms of innovation and manufacturing productivity. Despite the industry's small size, nearly all other machines used in the economy are built either directly or indirectly by machine tools. The industry is global and specialized. For each major type of machine tool, often only a handful of producers compete for business on a global basis.

Offsets appear to have had an impact on U.S.-based production in the metalworking machine tool industry (SIC 3541 and 3542). Based on the annual sales volume of the U.S. machine tool industry relative to the dollar value of offset transactions, the impact is seemingly small. In fact, the total dollar value of machine tool offsets for the three years 1993-1995 was $113 million, which is less than 1.0 percent of U.S. production over the time frame. However, the impact of offsets is not felt so much at the aggregate level as it is at the firm level.

Offsets contribute to the large U.S. machine tool trade deficit by increasing imports or reducing U.S. exports of machine tools. The $113 million in machine tool offset transactions were primarily fulfilled in Switzerland, Finland and Malaysia. In 1994-1995 alone, the U.S. machine tool trade deficit to Finland, a small producer ranked 21st in the world, was $33 million. The deficit with Switzerland (5th leading producer) was over $435 million. The United States had a $36 million surplus in trade with Malaysia, but this could have been much larger had there not been two offset deals to Malaysia worth over $60 million.

When offsets are used to influence purchasing decisions, and thereby preempt normal market forces, the loss of business will negatively impact some other global competitor. Some U.S. machine tool firms are globally competitive; these tend to be larger, and their presence in global markets makes them more vulnerable to market distortions and imperfections. Many of the U.S. firms are small, family owned businesses. In fact, about three-quarters of domestic machine tool companies employ fewer than 50 people. These smaller companies supply parts and components to the larger machine tool builders, and also stand to lose business as a result of offsets.

According to data collected for this report, offsets appear to have impacted some U.S. machine tool companies in the gear generating sector. The firms in this area lost potential sales of over $14 million from 1993-1995 as a result of offsets to a competitor firm in Europe. Their total sales in gear machinery during this time period was just over $335 million (*Current Industrial Report*, July 12, 1996). The offsets resulted in sales of European-made machine tools to major U.S. corporations who normally may have purchased U.S.-made tools. According to offset data reported to BXA, other types of machine tools that were affected by offsets were: punching presses, wire cutting machines, automatic presses, various grinding machines, machining centers, turret presses, and others. Most of these are also made in America, and the business opportunities of U.S. competitors were impacted. A corollary effect is that the offsets introduced some U.S. end-user firms to new potential foreign suppliers of machine tools, relationships that will continue over time as U.S. firms attempt to fulfill offset obligations as well as bank future offset credits.

2.2.3.8 Sector Breakout ─ The Effects of Offsets on the Aerospace Gear Industry: Gears are highly specialized items that are near the top of the spectrum in terms of mechanical complexity and manufacturing difficulty. This especially applies to aerospace gears, which are fabricated out of specialty metals to very tight tolerances. Most gear elements and components are designed and manufactured for specific end products. Thousands of customized part numbers are in use, which are difficult to replicate without the design drawings. An integrated

gearbox producer makes some of the gear elements in-house and buys others, and then mounts the elements on purchased shafts with other components such as bearings and seals inside the gearbox. The gear element (referred to as an *open gear*) producers play a key role in the supply chain by providing the various gearbox companies with hard-to-make gear elements. The machine tools needed to produce high precision gears are specialized and expensive, and cannot be economically justified by most gearbox producers unless volume is great enough; therefore, most gear elements are outsourced along with other components by the gearbox integrator.

The aerospace gear sector has long relied on defense for its principle market, especially on gear systems used in military helicopters. Statistics on total shipments are not readily available. However, in 1992, BXA published *The Effect of Imports of Gears and Gearing Products on the National Security*, an investigation conducted under section 232 of the Trade Expansion Act of 1962, as amended. The defense market share of the U.S. aerospace gear market was estimated at about 70 percent of the $537 million total shipments in 1991. Imports of gear elements and gearing were just over 17 percent of the U.S. market. Another important measure noted in the report was that about 40 percent of the business was captive to defense prime contractors, notably the helicopter or gas turbine engine companies. For example, Sikorsky and Bell Helicopter each made gearboxes, as well as some gear elements.

The sharp drop in U.S. defense requirements for aerospace gears had a profound impact on the industry. At least six U.S. aerospace gear manufacturers have gone out of business, including two independent major integrated gearbox producers. This, along with Boeing Helicopter's acquisition of Litton Gear Company, has increased the number of captive gear companies, and further isolated the remaining open gear subcontractors. In consideration of the reduced U.S. defense market for helicopters and other aircraft, exports of these items take on greater importance as a source of revenue to prime contractors. This circumstance places open gear subcontractors in a precarious position.

From the offset survey data, the immediate impact of offsets on the gear industry is difficult to assess and at first glance might seem slight. From 1993-1995, only one offset transaction was designated as *gears*, totaling $402,000. However, 134 offset transactions totaling $360 million were designated generically as *aircraft and parts*, offsetting U.S. prime helicopter exports. Of these, $161 million were direct offsets, of which $93 million were described as subcontractor activity. Some portion of this subcontractor activity would likely involve helicopter gears or gearing, although this was not specified by the prime contractor in its submission to BXA. Therefore, the reported $402,000 does not fully capture the extent of offsets in aerospace gears.

The major foreign producers of aerospace gears are both larger and more globally oriented than their American counterparts. U.S. aerospace gear companies were more technologically advanced than these firms in areas such as heat treatment and grinding until the early 1990s. However, offsets have resulted in additional business opportunities for and technology transfer to the foreign manufacturers. At the same time, foreign ownership of American companies increased, and new foreign-owned plants were constructed in the United States, accelerating the diffusion of technology. It is difficult to fully evaluate the contribution of offsets to the present ascendency of foreign gear firms. However, anecdotal comments by representatives of various companies involved indicate that it may have been significant.

The BXA Needs Assessment survey (see section 3) provides additional information which supports this assertion. In survey responses, seven aerospace gear companies reported a negative impact of offsets on their operations. No positive impacts were reported. Six of the companies produce open gears. One of the seven was an independent (i.e., non-captive) gearbox producer that subcontracted for all gear elements. The gearbox maker reported increased overseas competition as a direct result of offsets. Each of the six open gear producers reported lost business. One company stated that offset agreements have cost his company "millions" in lost revenue. Another company said that the U.S. defense applications are increasingly using offshore gear elements to satisfy prime contractor offset agreements. A third company said many part numbers originally made in the United States are now made overseas due to offsets.

As with machine tools, these offsets introduced some U.S. end-user firms to new potential foreign suppliers of aerospace gears, relationships that will continue over time as U.S. prime contractors engage in offset agreements.

2.2.3.9 Sector Breakout — The Effects of Offsets on the Shipbuilding and Repair Industry: At the end of 1996, according to *Lloyd's Register*, the United States stood ninth among the world's shipbuilding nations in terms of order backlog, with only a 1.8 percent share of world gross tonnage. Japan and South Korea alone shared about 60 percent of the world's backlog. The U.S. share was comprised mostly of military vessels. Much like the aerospace industry, the shipbuilding industry involves a great deal of subcontracting. Not only must the effect of offsetting on the prime shipbuilding contractors be considered, but also the effects on subcontractors which build such diverse components as shafts, boilers, valves, piping, pumps, fire-fighting equipment, deck rigging, crew accommodations, radar, and anchor chain. This has proven complicated; many of the components used in shipbuilding are classified in SIC codes of little specific relationship to the shipbuilding industry.

According to BXA statistics, the actual value of offset transactions in the shipbuilding industry totaled $347 million from the years 1993 to 1995. These were all indirect offset transactions, and all save two went toward fulfillment of offset agreements based on aerospace export sales. Most were purchases, some of entire vessels including several ferries and a cable-layer, and others of components such as propellers and ship chains. A few transactions were technology transfer. All of the agreements were made with European countries; Finland claimed the bulk of the transactions with $267 million. Other recipients included Norwegian, ($46 million), Dutch ($22 million), and Spanish ($11 million) companies.

The U.S. shipbuilding industry recorded revenues of $29.2 billion from 1993 to 1995. About $22.5 billion resulted from military contracts, and the commercial sector of the industry accounted for the balance. Almost all of the offset transactions are of a commercial nature; therefore, as the impact of offsets falls almost exclusively upon commercial yards, the value of offsets should be compared not to the size of the entire industry, but to the size of the commercial sector. Total offsets equaled 5.1 percent of the commercial shipbuilding and repair industry from 1993 to 1995, a rather significant figure. However, most of offset transactions occurred in 1993, when they equaled almost 10 percent of that year's commercial total.

The impact of these offsets on U.S. commercial shipbuilding is very difficult to ascertain, and underscores the general inadequacy of information available to assess the impact of offsets on the U.S. economy and industry, particularly at the subcontractor level. An argument can be made that the offset vessels and other components may have been built in foreign yards anyway, but paid for with local funds. This remains an unknown. On the other hand, if U.S. money was transferred to pay for these projects, it would reduce our trade balance with these nations, and almost certainly excluded American shipyard or subcontractor participation in the projects regardless of competitive merit.

The prime contractors in shipbuilding have seen their fortunes improve through the mid-1990s. President Clinton's shipbuilding initiative extended Title XI low-interest financing and loan guarantees (Merchant Marine Act of 1936, as amended) to deals involving foreign companies who agreed to purchase U.S.-built ships. This led to the conclusion of two singular sales of ocean-going merchant ships of considerable magnitude in 1994 and 1996. U.S. shipyards had a backlog of orders for 17 large (over 1000 gross tons) commercial vessels, the greatest number of such orders since 1982. In addition, the MARITECH program has provided millions of dollars to upgrade shipyard capital and technology. Of the six large shipbuilding firms which are publicly

traded, five, including Electric Boat, Newport News, Avondale, Ingalls, and General Dynamics, recorded profit increases ranging from gradual to dramatic.

Table 19. Commercial and Military Shipbuilding and Repair Industry, 1993 to 1995 (in millions of dollars)				
Category	**1993**	**1994**	**1995**	**Total**
Commercial self-propelled ships, new construction	678.4	573.0	459.6	1,711.0
Commercial repair	881.9	893.4	995.7	2,771.0
Commercial, all other	862.9	737.9	679.7	2,280.5
Commercial ship building and repairing, Total	$2,423.2	$2,204.3	$2,135.0	$6,762.5
Offsets, Total	237.4	80.2	29.1	346.7
Percent offsets of commercial total	9.8%	3.6%	1.4%	5.1%
Military, Total	7,378.2	7,672.2	7,408.5	22,458.9
Military and commercial, Total	9,801.4	9,876.5	9,543.5	29,221.4

Source: U.S. DOC, Bureau of the Census, Annual Survey of Manufactures, Value of Product Shipments, and BXA's Offset Reporting Data

However, this modest good news must be considered along with a longer, more dire trend that has seen the near-death of the industry. The decline in demand for U.S.-laid large commercial keels has been precipitous. In the 1970s, the world market routinely demanded 70-80 large American commercial vessels. After 1979, however, when 62 ships were demanded, the bottom fell out of the industry, with between 0-3 ships contracted each year from 1987 to 1994. The American shipbuilding industry, especially the large merchant vessel industry, thus finds itself in no position to comfortably write off the export of 8 percent of its potential business.

According to an industry spokesman, the U.S. shipbuilding industry's long-term woes are due to fundamental underlying problems, such as unfair competition practices among E.U. nations and the Far East, and American shipbuilders who are less technically educated than their European and Asian counterparts. However, offsets serve to compound the problems of the industry.

3. COMPETITIVE ENHANCEMENT AND DIVERSIFICATION NEEDS ASSESSMENT

BXA is involved in a number of defense diversification activities designed to maintain and enhance the U.S. defense subcontractor base. One such program, initiated by BXA in 1994, is the Competitive Enhancement and Diversification Needs Assessment Survey. This voluntary survey is directed toward small- and medium-sized businesses, and seeks to match the defense conversion and competitive enhancement needs of these firms with assistance programs available through various federal agencies and state governments. It has been mailed to U.S. subcontractors of major defense prime contractors. The survey gathers basic information about the subcontractors' operations, including sales, employment, and exports.

The survey includes several questions about offsets and their impact on the subcontractors as follows:

1. *Has your firm been involved in an offset agreement?*

2. *Has your firm been negatively affected by offset agreement practices? (For example: have you ever lost a sale because of an offset agreement, or have new competitors been created due to offset agreements)*

3. *Has your firm been positively affected by offset agreements?*

The question about *offsets involvement* in the needs survey could be interpreted as meaning participating in the formulation of offsets agreement(s), or *involved* at arms length without any real say in the terms of the agreement(s). Respondents were also asked to provide written comments if they responded to any of these questions. These responses provide BXA with the subcontractors' perspective on the offset issue, whether positive or negative, complementing the offset information received from the defense prime contractors. The Defense Production Act, Section 309(b) allows the inclusion of offset data gathered from other studies. It also requires that an analysis of the effects of offsets on lower tier subcontractors be included in the report.

Last year's *Offsets in Defense Trade* study reported that the total number of respondents to the BXA Needs Assessment survey was 1,153 firms. This number is now revised to 1,151 companies, and average employment is revised to 102 employees per firm, with the addition of three companies not counted last year, and the removal of five very large companies that greatly

skewed the numbers. The information in last year's report was collected over a two-year period ending in April 1996.

Since the 1996 report to Congress, a total of 703 additional Needs Assessment surveys were received. Of that total, 659 companies or about 94 percent of the survey population responded to the offset questions listed above. When asked about direct involvement in offsets, 614 companies reported no direct involvement while 45 firms reported that they were directly involved.

A total of 114 companies, or slightly over 17 percent of the respondents, reported that their businesses were impacted by offsets. Of these, 89, or 78 percent reported offsets adversely impacted their business. The other 25 companies (22 percent) reported that they were positively affected by offsets. In last year's study, a total of 202 companies (20 percent) of respondents reported an impact. Of these companies, 168 (83 percent) were negatively impacted, while 34 (17 percent) reported a positive impact.

Table 20 presents the overall categorical summary of responses to the Needs Assessment Survey questions on offsets. The percentages in the right two columns are based on the total responses to the offset questions.

Table 20. Needs Assessment Survey Responses to Offset Questions

Response Category	Number of Firms Reporting		Percent Distribution	
	previous	new	previous	new
Total Survey Population	1151	703	-	-
Total Responding to Offset Questions	987	659	100.0%	100.0%
Total Reporting Direct Offset Involvement	148	45	15.0%	6.8%
Total Reporting Impacts:				
Total Reporting Negative Impact	168	89	17.0%	13.5%
Total Reporting Positive Impact	34	25	3.4%	3.8%

Source: U.S. DOC/BXA Competitive Enhancement & Diversification Needs Assessment Survey
The company data from the Needs Survey were compared with respect to: 1) defense sales as a

portion of total revenues, 2) average employment, and 3) average shipments. The result, companies with larger defense market shares, more employees, and greater shipments were more likely to be involved directly or impacted by offsets. This would appear to mean that offsets generally impact larger subcontractor firms more than smaller ones. With respect to smaller firms, several inferences may be drawn:

1. Smaller firms could have a degree of immunity. For example, the scale of their operations would make offsetting less efficient, and thus less desirable.

2. Smaller firms may not recognize the impact. Assuming smaller firms are generally positioned deeper in the supply chain, communications beyond their immediate customer may be poor, or non-existent.

3. Smaller firms in general, may not be impacted by offsets. Offsets only occur when defense systems are exported, a small percentage relative to overall Defense procurement.

4. Smaller firms are versatile and offsets do not matter. Offsets are irrelevant to their success; business opportunities are available elsewhere.

Table 21 displays the relationship of offsets to defense sales. The information was calculated based on firms that reported defense business. This included 967 companies out of the 987 that responded as reported in last year's report and 512 out of 659 responses to the offset questions received after April 1996. The average defense share of the population's business was 36.7 percent last year and 32.9 percent this year. The 160 companies reporting a negative impact had larger shares at 50.1 percent last year, and the 83 new respondents for this year averaged 43.4 percent. The overall needs population shows a steady decline in defense business over a five year period. The data in the table reflects the same trend. Positive impacts dropped from 57.3 percent defense shares last year to 45.9 percent this year. The number of companies involved in offsets showed a slight increase. The relationship indicates that firms with greater defense shares are more likely to be involved or impacted by offsets.

Table 21. Relationship of Offsets to Defense Sales				
Offset Response Category	Number of Firms		% Defense Revenues	
	previous	new	previous	new
Total Population Reporting Defense Sales	967	512	36.7%	32.9%
- Negative Impact	160	83	50.1%	43.4%
- Positive Impact	33	22	57.3%	45.9%
- Involvement	143	42	48.4%	49.6%

Source: U.S. DOC/BXA Competitive Enhancement & Diversification Needs Assessment Survey

The relationship of offsets to employment (Table 22) indicates that larger firms are more likely to experience offset involvement or impacts than smaller firms. The table that follows provides the number of firms in each offset response category and their average employment. Average employment for the total population was 105 in last year's data and 80 for more recent respondents. In both years the negative impact includes smaller firms than those either involved or positively impacted. This may mean that smaller firms are more likely to be negatively impacted by offsets, although the information is inconclusive. The positively impacted firms are much larger in terms of average employment than the negatively impacted firms, which lends support to the last hypothesis. It also may indicate that larger firms have better defenses (patents, critical items, etc.), other business, more oversight, and greater influence on the offset and how it

Table 22. Relationship of Offsets to Employment				
Offset Response Category	Number of Firms		Avg. Employees	
	previous	new	previous	new
Total Population Reporting Employment	967	636	105	80
- Negative Impact	164	85	165	93
- Positive Impact	33	23	274	156
- Involvement	145	42	242	237

Source: U.S. DOC/BXA Competitive Enhancement & Diversification Needs Assessment Survey

affects them. Further, the prime contractors may recognize the larger firms as critical first-tier subcontractors, and not wish to compromise or jeopardize their relationship. Finally, the positive impacts most likely indicate that the given offsets generated export business for the prime(s) and sales for the subcontractor reporting the positive impact.

The relationship of offsets to total sales is presented in Table 23. The shipment information was reported by Needs Survey respondents as a number from 1 to 6, with 6 the highest annual sales at more than $10 million. The sales numbers were very difficult to estimate, but based on average point totals (between 1-6), they support the conclusions reached from the previous two tables. It is clear that those firms reporting involvement or impacts were larger in sales volume than those firms reporting nothing.

Table 23. Relationship of Offsets to Total Sales

Offset Response Category	Number of Firms		Avg. Shipments (in $millions)	
	previous	new	previous	new
Total Population Reporting Sales	969	637	$10.5	$8.0
- Negative Impact	166	87	$16.5	$9.3
- Positive Impact	33	24	$27.4	$15.6
- Involvement	146	44	$24.2	$23.7

Source: U.S. DOC/BXA Competitive Enhancement & Diversification Needs Assessment Survey

3.1 Subcontractor Comments on Offsets

Comments were received from many of the Needs Assessment Survey respondents regarding offsets. Companies providing comments represent a wide cross-section of products, including aircraft and parts, electronic components, fabricated metal products, metal working machinery and equipment, and numerous other items. While this information is only anecdotal, it provides a perspective on the impact of offset agreements on the subcontractor base.

Several companies mentioned that small- and medium-sized firms do not have the resources to

meet the requirements of offset agreements, thereby placing them at a competitive disadvantage. However, several comments indicated that offsets made a positive impact. One company indicated that an offset agreement enabled them to become involved in international business for the first time. Another firm indicated that a certain amount of business was the result of receiving orders from prime contractors involved in offset agreements and without the offsets that business may not have materialized.

Comments Received Since April 1996

The new comments were similar to those of previous years. The most frequent comment referred to a loss of business to foreign companies that have been promised contracts as a result of offset agreements. Often, offsets would result in the foreign buyer shifting certain components and subassemblies from U.S. subcontractors to subcontractors in his own country. One respondent produced an internal wing subassembly for a major airframe manufacturer at $10,000 per unit. After producing 200 units the business was relocated to a company in Western Europe. The prime contractor reportedly transferred the business to a European company to facilitate an offset agreement in the export sale of military aircraft. Another U.S. subcontractor lost business after a U.S. prime contractor gave a European country $10 million in annual gear actuator contracts.

Technology transfer is often used as an offset, potentially creating foreign competitors who may then use the process technology to block future (component) exports into their market or to enter U.S. markets. The newly created foreign competitor may also be subsidized by their government, a common practice in many foreign aerospace markets.

The following table presents survey comments on the impact of offsets. In addition to the comments, a brief business description of each company is given with the geographic location by region (East Coast, Midwest, South West, or West Coast).

Table 24. Needs Assessment Company Comments on Offsets		
Region	**Business Description**	**Company Comments on the Impact of Offsets**
East Coast	Engine components for aviation industry.	"Prime manufacturers incur incredible economic loss; transfer of U.S. jobs overseas leads to unemployment of more productive people; transfer of U.S. technology overseas is frightening."
East Coast	Manufacturer of sensing devices for aircraft engines.	"If the U.S. produced end product was purchased by [a foreign country], components for that product would be given to [the foreign purchaser's] sub-contractors. On several occasions in the past, contracts were decided based on offset requirements."
East Coast	Engineering and research	"[A U.S. prime contractor] awarded a project to our firm with Korean offset dollars."
East Coast	Manufacturer of electronic connectors and components.	"Competing company was foreign owned and involved in offset credits. Contracts in the past have included offset terms. [Offsets] can influence a competitive bid."
East Coast	Manufacturer of electronic modules for defense systems.	"Without certain offset agreements, the contract of the prime of which we are involved as a sub-contractor, may not have materialized."
East Coast	Aircraft composites manufacturer.	"Aerospace business is going offshore due to offsets, our company is losing many opportunities."
East Coast	Manufacturer/fabricator of aerospace components.	"In a couple of Pacific Rim areas, competitors have established offset agreements to eliminate the sale of our product."
East Coast	Aircraft gear and shaft manufacturer.	"A vast percentage of U.S. DOD gearing requests are coming from offshore through unfair competition and U.S. OEM's offset agreements."
East Coast	Manufacturer of electronic high frequency communications products.	"Offset requirements in international contracts sometimes demand that we not participate in an opportunity or project."
East Coast	Manufacturer of aircraft instrumentation, automotive	"We have lost contracts because of offset agreements....."

Table 24. Needs Assessment Company Comments on Offsets		
Region	**Business Description**	**Company Comments on the Impact of Offsets**
	products, and military ordnance.	

Table 24-Continued. Needs Assessment Company Comments on Offsets		
Region	**Business Description**	**Company Comments on the Impact of Offsets**
Midwest	Manufacturer of mechanical support equipment for military aircraft, surface ships, missiles and weapon systems.	"Various governments' decisions to purchase [U.S. built] aircraft have mandated the purchase of some equipment from their respective countries' suppliers."
Midwest	Manufacturer of process control instruments.	"..... Offset agreements between large companies domestically and those in Europe or [the] Pacific Rim tend to monopolize the process industry. Ventures like these and money spent allow for large groups to dictate their ideas to all others."
Midwest	Product design and engineering of electro-mechanical subassemblies.	"[We have] lost business opportunities on aircraft sub-assembly of our current technologies and manufacture, to companies within foreign countries that have been promised offset business."
Southwest	Aircraft components.	"Lost contract opportunity to supply exterior lights on a new transport aircraft. We were best in price and technical proposal but the manufacturer of aircraft chose to place contract in country where sales of new aircraft demanded that work load on that aircraft be placed in that country."
Southwest	Electrical connectors.	"Somewhat positively affected by offset agreements."
Southwest	General Machine Shop - High quality parts using computer numerical control equipment.	"We lost a rib assembly to foreign company because of offset."
Southwest	Machine shop.	"Material work for machined honeycomb core was given to foreign companies."
Southwest	Chemical milling of aluminum, titanium, and steel.	"[U.S.] offset agreements with Pacific Rim buyers have cost U.S. jobs."
West Coast	Manufacturer of gears for aerospace.	"Offset agreements have cost my company millions in lost revenue."
West Coast	Composites producer for aerospace.	"[We] will experience negative impact due to offset agreements

Table 24-Continued. Needs Assessment Company Comments on Offsets		
Region	**Business Description**	**Company Comments on the Impact of Offsets**
		since our customers are typically large prime contractors who use offset agreements to help sell their products. Advanced composites fabrication technology has often been used as an offset, thus creating a foreign competitor who then uses the process technology to enter the U.S. markets to compete unfairly."

Table 24-Continued. Needs Assessment Company Comments on Offsets		
Region	**Business Description**	**Company Comments on the Impact of Offsets**
West Coast	Manufacturer of structural airframe/aerospace components.	"[U.S. prime contractor] offset to Korea, Japan, etc. has affected our product support."
West Coast	Design and manufacture on-board aircraft systems.	"We participated with [a U.S. prime contractor] in an aircraft related Australian offset program. We provided kits for assembly and test of electronic control modules. We benefited by expanding our international business ."
West Coast	Manufacturer of industrial computer systems.	"Larger companies have the resources to go after offset agreements. It is difficult for us to compete in this area."
West Coast	Manufacturer of aerospace fasteners.	"Offshore competitors have literally been put into business to effectively compete against us."
West Coast	Electronic components.	"Foreign purchase of tactical computer system required use of a foreign produced component instead of ours."
West Coast	Industrial machinery distributor.	"I have lost equipment sales to a Swiss company that had an offset agreement with [a U.S. prime aerospace contractor]."
West Coast	Precision drawn tubing.	"The reciprocal agreements of [U.S. prime aerospace contractors] with Japan fostered competition from that country, adversely impacting our business and setting up subsidized competition."
West Coast	Plating on aerospace and aircraft engine hardware.	"[A U.S. prime aerospace contractor] moved purchases for manufacturing and plating of aircraft engine hardware to Turkey in an offset agreement. In view of the downturn in the aerospace business in Southern California, the negative impact of lost

Table 24-Continued. Needs Assessment Company Comments on Offsets		
Region	**Business Description**	**Company Comments on the Impact of Offsets**
		business is even more apparent."
West Coast	Manufacturer of systems for electronic warfare.	"It is difficult for small businesses to meet the requirements of offset agreements, which puts us at a competitive disadvantage."
West Coast	Provides testing services to the advanced materials and electronics industries.	"Offset agreements in the aircraft manufacturing area have reduced subcontracting here."
West Coast	Manufacturer of precision gears.	"[A U.S. prime contractor] is one of my biggest accounts. They have had an offset program with Spain sending gear work there that normally I would have seen. [Prime contractor] is sending gear work to a foreign country due to an offset agreement."

Table 24-Continued. Needs Assessment Company Comments on Offsets		
Region	**Business Description**	**Company Comments on the Impact of Offsets**
West Coast	Manufacturer of electronic connector accessories.	"Offsets typically create competitors in a prospective market, obstructing future business to the region."
West Coast	Manufacturer of flight critical hardware.	"Offset programs have affected our prime OEM which has been affected by offset purchase agreements between the aerospace and airline industries."
West Coast	Production, machining and assembly of metals and plastics.	"Offsets have taken work out of our shop and put it into other countries around the world."
West Coast	Manufacturer of aerospace fasteners, pins, bushings, and machined parts.	"Offshore competitors have literally been put into business to effectively compete against us."

Source: U.S. DOC/BXA Competitive Enhancement & Diversification Needs Assessment Survey

4. RECOMMENDATIONS

The May 1996 report Offsets in Defense Trade listed three recommendations:

1. Implement consultations with major U.S. arms producers, both primes and subcontractors, and with labor to gather representative views on minimizing the adverse effects of offsets in defense trade.

2. Consult with our trading partners on offsets in defense trade and related military procurement issues.

3. Review and modify as necessary current U.S. Government policy on offsets in defense trade to respond to the changing nature of offset demands, reflecting both the need for U.S. firms to remain competitive in international arms markets and the need to maintain our defense industrial base. The United States should be cautious in making any decision to unilaterally limit offsets.

The Trade Promotion Coordinating Committee, in the Offsets chapter of its October 1996 National Export Strategy (see Appendix D), developed a similar list of recommendations.

In implementation of these recommendations:

1. **Effort to Build Domestic Consensus**: On June 9, 1997, the Bureau of Export Administration co-sponsored a workshop entitled *Policy Issues in Aerospace Offsets.* The workshop was hosted by the National Research Council's Board on Science, Technology, and Economic Policy. This workshop served as a forum for exchanging views and building a consensus as to what would constitute an appropriate U.S. policy on offsets. The participants focused on many important issues such as pressures faced by industry in international competition for business, trends in countries' demands for offsets, and the long-term consequences on U.S. competitors of offsets as industrial policy tools. Once a domestic consensus is achieved, a multilateral offset policy is more likely to ensue that will reflect a common set of mutually beneficial interests.

2. **Consultations with U.S. Primes and their Representatives**: Based on the information gathered at the meetings and consultations, we will determine the best strategy for international discussions. Bureau of Export Administration Officials have and will continue talks with the Aerospace Industry Association and other groups, including U.S. prime contractors, to understand their concerns as major offset stake-holders, and to gain their participation in formulating a policy.

3. **Consultations with Government Agencies, Subcontractors and Other Concerned Parties**: We have scheduled a series of meetings through the fall at Commerce with interested groups to learn from them what their concerns are, to broaden their understanding of the complexity of the issue, and to begin to build support in the U.S. for an international initiative. Those with whom we will meet would include the agencies of the U.S. government, affected subcontractors or suppliers, unions, congressional staff members, and representative associations.

4. **Develop Strategy for Multilateral Consultations**: We will plan a meeting of Washington-based defense attachés to discuss the results of our meetings with interested parties. We also plan to pursue, as appropriate, bilateral and multilateral consultations on offsets in defense trade.

Appendix A

Appendix B

APPENDIX B:
ITEMIZED LIST OF INFORMATION COLLECTED ANNUALLY FROM INDUSTRY

Required Reporting on Offset Transactions

On an annual basis, industry is required to submit to the Department of Commerce an itemized list of offset transactions completed during the report period, with the following data elements:

Name of Country - Country of entity purchasing the weapon system, defense item or service subject to offset.

Name or Description of Weapon System, Defense Item, or Service Subject to offset.

Name of Fulfilling Entity - Entity fulfilling offset transaction (including first tier subcontractors).

Name of Offset Receiving Entity - Entity receiving benefits from offset transaction.

Offset Credit Value - Dollar value credits claimed by fulfilling entity including any intangible factors/multipliers.

Actual Offset Value - Dollar value of the offset transaction without multipliers/intangible factors.

Description of Offset Product/Service - Short description of the type of offset (e.g., co-production, technology transfer, subcontract activity, training, purchase, cash payment, etc.)

Broad Industry Category - Broad classification of the industry in which the offset transaction was fulfilled (e.g., aerospace, electronics, chemicals, industrial machinery, textiles, etc.)

Direct or Indirect Offset - Specify whether the offset transaction was a direct or indirect offset.

Name of Country in which Offset was Fulfilled - United States, purchasing country, or third country.

Offset transactions of the same type (same fulfilling entity, receiving entity, and offset product/service) completed during the same reporting period could be combined.

Reporting on Offset Agreements Entered Into

In addition to the itemized list of offset transactions completed during the specified time period, U.S. firms were asked to provide information regarding new offset agreements entered into during the year, including the following elements:

Name of Country - Entity Purchasing the Weapon System, Defense Item, or Service Subject to Offset.

Name or Description of Weapon System, Defense Item, or Service Subject to Offset.

Names/Titles of Signatories to the Offset Agreement

Value of Export Sale Subject to Offset (approximate)

Total Value of the Offset Agreement

Term of Offset Agreement (months)

Description of Performance Measures (e.g.,"best efforts", liquidated damages)

Appendix C

APPENDIX C:
PARTIAL LISTING OF PREVIOUS U.S. GOVERNMENT REPORTS

October 1985	***Assessment of the Effects of Barter and Countertrade Transactions on U.S. Industries*** - U.S. International Trade Commission**.**
December 1985	***The Impact of Offsets in Defense-Related Exports*** - Office of Management and Budget**.**
December 1986	***Second Annual Report on the Impact of Offsets in Defense-Related Exports*** - Office of Management and Budget.
December 1987	***Impact of Offsets in Defense-Related Exports: A Summary of the First Three Annual Reports*** - Office of Management and Budget.
December 1988	***Offsets in Military Exports*** - Office of Management and Budget**.**
April 1990	***Report on Offsets in Military Exports*** **-** Office of Management and Budget.
April 1996	***Military Exports: Offset Demands Continue to Grow*** **-** U.S. General Accounting Office.
May 1996	***Offsets in Defense Trade: A Study Conducted Under Section 309 of the Defense Production Act of 1950, As Amended*** - U.S. Department of Commerce
June 1997	***Policy Issues in Aerospace Offsets: Report of A Workshop*** - Board on Science, Technology, and Economic Policy, National Research Council.

Appendix D

Appendix E

U.S. DEPARTMENT OF COMMERCE
BUREAU OF EXPORT ADMINISTRATION
STRATEGIC ANALYSIS DIVISION

LIST OF PUBLICATIONS

Italics indicate forthcoming studies

NTIS PB#	PUBLICATION TITLE	NTIS Price	Target Date to NTIS
PB 97-193023	*National Security Assessment of the U.S. High-Performance Military Explosives & Components Sector*	$95	Summer 1998
PB 97-117782	*National Security Assessment of the Emergency Aircraft Ejection Seat Sector*	$95	September 1997
PB 97-193015	Offsets in Defense Trade - Conducted under Section 309 of the Defense Production Act of 1950 - August 1997	$95	On Sale
PB 96-100011	Critical Technology Assessment of the U.S. Semiconductor Materials Industry - April 1997	$95	On Sale
PB 97-133789	Offsets in Defense Trade - Conducted under Section 309 of the Defense Production Act of 1950 - May 1996	$95	On Sale
PB 96-100045	National Security Assessment of the Cartridge and Propellant Actuated Device Industry - September 1995	$95	On Sale
PB 95-101382	The Effect of Imports of Crude Oil and Petroleum Products on the National Security - February 1995	$95	On Sale
PB 93-192409	Critical Technology Assessment of U.S. Artificial Intelligence - August 1994	$95	On Sale
PB 93-192433	Critical Technology Assessment of U.S. Superconductivity - April 1994	$95	On Sale
PB 93-192425	Critical Technology Assessment of U.S. Optoelectronics - February 1994	$95	On Sale
PB 93-182383	Critical Technology Assessment of U.S. Advanced Ceramics - December 1993	$95	On Sale
PB 93-192391	Critical Technology Assessment of U.S. Advanced Composites - December 1993	$95	On Sale
PB 93-192441	The Effect of Imports of Ceramic Semiconductor Packages on the National Security - August 1993	$95	On Sale
PB 93-192458	National Security Assessment of the U.S. Beryllium Industry - July 1993	$95	On Sale
PB 93-154474	National Security Assessment of the Antifriction Bearings Industry - February 1993	$95	On Sale
PB 93-183721	National Security Assessment of the U.S. Forging Industry - December 1992	$95	On Sale
PB 93-192466	The Effects of Imports of Gears and Gearing Products on the National Security - July 1992	$95	On Sale
	National Security Assessment of the Domestic and Foreign Subcontractor Base: A Study of Three U.S. Navy		

NTIS PB#	PUBLICATION TITLE	NTIS Price	Target Date to NTIS
PB 93-183739	Weapon Systems - March 1992	$95	On Sale
PB 93-192474	National Security Assessment of the U.S. Semiconductor Wafer Processing Equipment Industry - April 1991	$95	On Sale
PB 93-192482	National Security Assessment of the U.S. Robotics Industry - March 1991	$95	On Sale
PB 93-192490	National Security Assessment of the U.S. Gear Industry - January 1991	$95	On Sale
PB 93-192516	Effects of Imports of Uranium on the National Security - September 1989	$55	On Sale
PB 93-192524	Effects of Crude Oil and Refined Petroleum Product Imports on the National Security - January 1989	$55	On Sale
PB 93-192532	Effects of Imports of Plastic Injection Molding Machines on the National Security - January 1989	$55	On Sale
PB 93-192540	Effects of Imports of Anti-Friction Bearings on the National Security - July 1988	$65	On Sale
PB 93-192557	Investment Castings: A National Security Assessment - December 1987	$65	On Sale
PB 93-192565	Joint Logistics Commanders/DOC Precision Optics Study - June 1987	$55	On Sale
PB 93-192573	An Economic Assessment of the U.S. Industrial Fastener Industry - March 1987	$55	On Sale
PB 93-192599	Joint Logistics Commanders/DOC Bearing Study - June 1986	$55	On Sale

You can read synopses of and place an order for these reports through our homepage:
http://www.bxa.doc.gov/natlsecr.htm

You can also order reports by telephone from the National Technical Information Service (NTIS):

NTIS Sales Desk - 703-487-4650
NTIS Rush Order Desk - 1-800-553-NTIS

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OFFSETS IN DEFENSE TRADE

Third Annual Study Conducted under Section 309 of the Defense Production Act of 1950, As Amended

Prepared By
U.S. Department of Commerce
Bureau of Industry and Security
Office of Strategic Industries and Economic Security
Strategic Analysis Division

August 1998

NOTE: The Bureau of Export Administration changed its name to the Bureau of Industry and Security in April 2002.

Copies are available for sale from the National Technical Information Service (NTIS) by calling 703-605-6000 and requesting PB 98-148265

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OFFSETS IN DEFENSE TRADE

EXECUTIVE SUMMARY

This is the third annual report on offsets in defense trade prepared by the Department of Commerce's Bureau of Export Administration (BXA), as required by the 1992 amendments to Section 309 of the Defense Production Act of 1950, as amended. The report includes 1996 offsets data reported by U.S. firms in the last year and combines it with data collected previously from 1993-1995.

* * * * *

Between 1993 and 1996, 32 U.S. companies entered into 173 new offset agreements with foreign governments valued at $15.1 billion, with an average completion term of 87 months. The agreements supported $29.1 billion in defense contracts. Five companies accounted for 78 percent of the value of these new offset agreements and 80 percent of export contract values. The new agreements were concluded with 28 countries. By value, 72 percent of new agreements were concluded with just five countries, and 80 percent with eight countries. The offset agreements, in total, represented 52 percent of the export contract values.

In addition to entering into new offset agreements, U.S. companies also carried out transactions in accordance with agreements reached in previous years. During the four-year period, 34 U.S. companies reported 2,277 individual offset transactions valued at $9.2 billion, for which they secured offset credits valued at $10.7 billion. Five companies accounted for 80 percent of the value, and nine companies, for 91 percent. Transactions were completed in 31 countries, with the top five countries accounting for 58 percent of the value. Transactions referenced 150 separate weapon systems (five of these represented 53 percent of the total value). Also, more than 900 offset recipients were identified. The top 10 recipients accounted for 24 percent of the total value of offset transactions.

Seventy-three percent of the transactions' value were subcontracting activity, purchases (counter trade), or technology transfer. Nearly half of the offset transactions were related to transportation equipment (including aircraft and aircraft parts), 16 percent of the transactions were in the electronics and electrical equipment sector, and nine percent in industrial machinery.

For 1993 to 1996, 38 percent of the value of the transactions were direct offsets, 58 percent indirect, and 4 percent unspecified, with significant variation by country. The allocation was often closely linked to the size of the country's indigenous aerospace sector. Generally, countries with established aerospace sectors tended to fulfill offsets with aerospace products; and these were mostly direct. There is also an interesting split between aerospace and non-aerospace product transactions. About two-thirds of all aerospace product transactions ($3.13 of $4.96 billion) were direct offsets, and these accounted for 90 percent of total direct offsets. In contrast, non-aerospace products accounted for about 70.4 percent of total indirect offsets ($3.78 of $5.38 billion).

Direct offset transactions rose to about 43 percent in 1996, up from the 40 percent recorded last year. This extended to four years the upward trend in direct offsets. The trend reflects very substantial increases in subcontractor activity in the United Kingdom and a very large jump in technology transfers to S. Korea. The large increase in subcontractor activity was moderated somewhat by a decreases in Israel, Canada, and Australia

Europe has become the central focus of offsets. In the four reporting years, European countries entered into 94 new offset agreements with U.S. firms valued at more than $10 billion, with an average offset equaling 90 percent of the export contract value. In the last two years of the reporting period, European countries alone accounted for 85 percent of the value of all new offset agreements; the value of European offsets averaged more than 100 percent of the value of the export contracts. The rest of the world, with an average offset agreement equal to only 28 percent of the export contract, accounted for $5 billion in offsets.

As for the newest data, the value of new offset agreements entered into in 1996 was down sharply from 1995, and well below four-year averages. In 1996, reported new agreements of $2.27 billion supported $3 billion in new export contracts. New offset agreements were down over 60 percent from the $6 billion reported in 1995, and more than 40 percent below the four-year average of $3.8 billion.

Worldwide, 1996 new offset agreements as a percent of export contract values were 76 percent, compared to 81 percent in 1995. The 1995 and 1996 percentages of offsets to export contract values were the third and fourth highest levels recorded since 1980.

In 1996, a total of 621 offset transactions valued at $2.86 billion were reported, with a credit value of $3.07 billion. The 1996 values were the largest for transactions for the four years, and capped off four years of steady increases. The 1996 value was almost 8 percent more than 1995 values, although this was not as dramatic as the 40 percent increase observed between 1994 and 1995.

OFFSETS IN DEFENSE TRADE

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1. OVERVIEW

1.1 Legislation and Regulations

In 1984, Congress enacted amendments to the Defense Production Act of 1950, as amended, which included the addition of Section 309. Section 309 required the President to submit an annual report on the impact of offsets on U.S. defense preparedness, industrial competitiveness, employment, and trade to the Committee on Banking, Finance, and Urban Affairs of the House of Representatives and the Committee on Banking, Housing, and Urban Affairs of the Senate.

When Section 309 was first enacted, the Office of Management and Budget (OMB) was appointed as the interagency coordinator in the preparation of the annual offsets report for the Congress. These reports were to be prepared in consultation with the Departments of Commerce, Defense, and Labor, and the Office of the United States Trade Representative. This interagency reporting requirement continued, with minor adjustments, until 1992, when Section 309 underwent major modifications. The interagency coordination role was then transferred from OMB to the Secretary of Commerce.

The Secretary was given authority to develop and administer regulations to collect from industry the offset data required for the report. This responsibility was later delegated to the Department's Bureau of Export Administration (BXA). The regulations are at 15 C.F.R. Part 701. A change was also made in Section 309, adding a sales reporting threshold previously cited in the National Defense Authorization Act for fiscal year 1991. The offset agreement threshold was reduced from $50 million to $5 million for U.S. firms entering into foreign defense sales contracts subject to offset agreements. On a per-transaction level, firms report all offset transactions for which they receive offset credits of $250,000 or more. A copy of Section 309 can be found in *Appendix A*. An itemized list of information that is collected annually from industry is located in *Appendix B*.

1.2 Background

Definitions of offsets used by industry and government are sometimes inconsistent. Most parties, however, use the following definition, which was developed by a U.S. Government interagency group in 1986. *Offsets are industrial compensation practices required as a condition of purchase in either government-to-government or commercial sales of defense articles and/or defense services as specified in the International Traffic*

in Arms Regulations. In defense trade, offsets include mandatory co-production, licensed production, subcontractor production, technology transfer, countertrade, and foreign investment. Offsets may be direct, indirect, or a combination of both. Direct offsets refer to compensation, such as co-production or subcontracting, "directly" related to the weapon system being exported. Indirect offsets apply to compensation unrelated to the exported item, such as foreign investment or countertrade.

Countries require offsets for a variety of reasons: to ease (or "offset") the burden of large defense purchases on their economy; to increase or preserve domestic employment; to obtain technology; and/or to promote targeted industrial sectors. In discussions with BXA, U.S. prime contractors reported that defense exporters frequently must fulfill these demands or risk losing the export sale. Moreover, industry informed BXA that, in many cases, defense exporters cannot even submit a bid proposal without including an offset package.

Since World War II, U.S. defense industries have been major players in the international arms market. Co-production/licensed production in defense trade were initially encouraged by the U.S. Government to help rebuild the war-ravaged economies and industrial bases of Western Europe and Japan. During the Cold War, it was in the best interests of the U.S. to ensure that allied countries were strong militarily as well as economically. Co-production/licensed production of U.S. weapon systems in foreign countries began in the late 1950s and early 1960s. The NATO countries and Japan were the first to enter into such agreements with the United States.

Historically, offsets have served important foreign policy and national security objectives of the United States, such as increasing the industrial capabilities of allied countries, standardizing military equipment, and modernizing allied forces. The use of offsets is now commonplace. Today, virtually all U.S. defense trading partners impose some type of offset requirement, and at times the stated value of the offset exceeds that of the sales contract.

The type of offsets demanded by buyer countries is changing as many countries face decreasing security threats and excess capacity in their arms industries. Foreign governments typically use direct offsets involving co-production to justify expensive arms purchases, claiming that the purchase will boost local employment and national security by helping to maintain domestic defense industries.

Increased competition for a declining number of international arms contracts and weak domestic defense markets should continue to foster offset agreements. U.S. technology

and weapon systems, notably aerospace, are some of the best available on the world market, and the U.S. economy is the largest and most diverse. These factors confer general competitive advantages on U.S. defense firms over foreign competitors in the range of direct and indirect offsets they can provide.

While arms exporters can use offsets as a "marketing tool" to a limited extent, buying governments appear to have greater market leverage in light of shrinking global defense markets. In cases where buyers recognize that the costs outweigh the benefits of a particular direct offset, industry noted that the buyers may emphasize indirect offsets rather than stop demanding offsets altogether.

The BXA offset database, covering the years 1993-96, reveals that almost 92 percent of the agreements support the export of aerospace products (i.e., aircraft, missiles, and engines). Those countries with an indigenous aerospace industry tend to demand direct offsets (or aerospace related indirect offsets) while those countries without an indigenous aerospace industry opt for indirect offsets as a means to promote economic development, to diversify arms industries, or to improve their balance of trade.

The aggregated data for 1993-96 shows that 38 percent of the value of offsets transactions were direct (related to the weapon systems sold), 58 percent were indirect (not related to the weapon systems sold), and 4 percent were unspecified. In 1996, direct offsets rose to 43.3 percent, from about 40 percent in 1995. Almost three-fourths of total offsets for the four-year period (direct and indirect) involved the purchase or subcontracting of goods and services or the transfer of technology. During the same period aerospace and other transportation equipment comprised approximately 50 percent of all offsets, while electronics and other electrical equipment amounted to 17 percent, and machinery and equipment was 9 percent.

From an industry perspective, most companies would prefer to compete on the basis of quality and price of their primary product, rather than participate in offset agreements. In general, U.S. defense firms are not in the consulting, technology transfer, risk capital, or marketing business. However, because of foreign government demands, offsets have become a recognized part of doing business with customers, and U.S. defense firms are responding to these demands.

1.3 Efforts to Develop an Offsets Policy

The first annual BXA report, *Offsets in Defense Trade, May 1996,* listed three recommendations for implementation by the interagency community:

1. *Implement consultations with major U.S. arms producers, both primes and subcontractors, and with labor to gather representative views on minimizing the adverse effects of offsets in defense trade.*

2. *Consult with our trading partners on offsets in defense trade and related military procurement issues.*

3. *Review and modify as necessary current U.S. Government policy on offsets in defense trade to respond to the changing nature of offset demands, reflecting both the need for U.S. firms to remain competitive in international arms markets and the need to maintain our defense industrial base. The United States should be cautious in making any decision to unilaterally limit offsets.*

A similar list of recommendations was detailed in the Interagency Trade Promotion Coordinating Committee's annual *National Export Strategy* report to the President for 1996.

The second annual BXA report, *Offset in Defense Trade, August 1997,* defined a strategy for achieving a domestic consensus on offsets policy, including consultations with U.S prime contractors, defense subcontractors and other interested parties, including unions, congressional staffs, and trade associations. The strategy included the following:

1. *Effort to Build Domestic Consensus: On June 9, 1997, the Bureau of Export Administration co-sponsored a workshop entitled Policy Issues in Aerospace Offsets. The workshop was hosted by the National Research Council's Board on Science, Technology, and Economic Policy. This workshop served as a forum for exchanging views and building a consensus as to what would constitute an appropriate U.S. policy on offsets. The participants focused on many important issues such as pressures faced by industry in international competition for business, trends in countries' demands for offsets, and the long-term consequences on U.S. competitors of offsets as industrial policy tools. Once a domestic consensus is achieved, a multilateral offset policy is more likely to ensue that will reflect a common set of mutually beneficial interests.*

2. *Consultations with U.S. Primes and their Representatives: Based on the information gathered at the meetings and consultations, we will determine the best strategy for international discussions. Bureau of Export Administration Officials have and will continue talks with the Aerospace Industry Association*

and other groups, including U.S. prime contractors, to understand their concerns as major offset stake-holders, and to gain their participation in formulating a policy.

3. *Consultations with Government Agencies, Subcontractors and Other Concerned Parties: We have scheduled a series of meetings through the fall at Commerce with interested groups to learn from them what their concerns are, to broaden their understanding of the complexity of the issue, and to begin to build support in the U.S. for an international initiative. Those with whom we will meet would include the agencies of the U.S. government, affected subcontractors or suppliers, unions, congressional staff members, and representative associations.*

4. *Develop Strategy for Multilateral Consultations: We will plan a meeting of Washington-based defense attachés to discuss the results of our meetings with interested parties. We also plan to pursue, as appropriate, bilateral and multilateral consultations on offsets in defense trade.*

A list of other offsets reports, including those published by OMB, is provided in *Appendix C*.

1.4 Offset Definitions

Listed below are offset definitions as outlined in the *Federal Register* (Vol. 59, No. 231) dated December 2, 1994, prepared by BXA (codified at 15 CFR Part 701); and *Offsets in Military Exports*, OMB, dated December 1988.

Offsets: Industrial compensation practices required as a condition of purchase in either government-to-government or commercial sales of defense articles and/or defense services as defined by the Arms Export Control Act and the International Traffic in Arms Regulations.

Military Export Sales: Exports that are either Foreign Military Sales (FMS) or commercial (direct) sales of defense articles and/or defense services as defined by the Arms Export Control Act and International Traffic in Arms Regulations.

Direct Offsets: Contractual arrangements that involve defense articles and services referenced in the sales agreement for military exports.

Indirect Offsets: Contractual arrangements that involve goods and services unrelated to the exports referenced in the sales agreement.

Co-production: Overseas production based upon government-to-government agreement that permits a foreign government(s) or producer(s) to acquire the technical information to manufacture all or part of a U.S. origin defense article. It includes government-to-government licensed production. It excludes licensed production based upon direct commercial arrangements by U.S. manufacturers.

Licensed Production: Overseas production of a U.S. origin defense article based upon transfer of technical information under direct commercial arrangements between a U.S. manufacturer and a foreign government or producer.

Subcontractor Production: Overseas production of a part or component of a U.S. origin defense article. The subcontract does not necessarily involve license of technical information and is usually a direct commercial arrangement between the U.S. manufacturer and a foreign producer.

Overseas Investment: Investment arising from the offset agreement, taking the form of capital invested to establish or expand a subsidiary or joint venture in the foreign country.

Technology Transfer: Transfer of technology that occurs as a result of an offset agreement and that may take the form of: research and development conducted abroad; 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 a foreign entity.

Countertrade: In addition to the types of offsets defined above, various types of commercial countertrade arrangements may be required. A contract may include one or more of the following mechanisms:

> Barter: A one-time transaction only, bound under a single contract that specifies the exchange of selected goods or services for another of equivalent value.
> Counter-purchase: An agreement by the initial exporter to buy (or to find a buyer for) a specific value of goods (often stated as a percentage of the value of the original export) from the original importer during a specified time period.
> Compensation (or Buy-Back): An agreement by the original exporter to accept as full or partial repayment products derived from the original exported product.

Additional Definitions used in this report:

Offset Agreement: A counter contract to a military export sale negotiated separately between the foreign purchaser, usually a foreign government, and the U.S. exporter as a condition of the export sale. The offset agreement requires the U.S. exporter to compensate the foreign purchaser with various types of offsets. The statutory reporting threshold for an offset agreement is $5 million.

Offset Transaction: An offset transaction is an actual delivery of an offset against the outstanding balance of an existing offset agreement. The regulatory reporting threshold for offset transactions is $250,000.

Actual Value of an Offset: An offset transaction measured in terms of dollars.

Credit Value of an Offset: The offset transaction value applied against the offset agreement, which may be greater than the actual value of the offset. Extra credit (i.e., defined through multipliers) is sometimes earned as an incentive to perform some specific offset, such as investment or technology transfer of particular interest to the foreign government.

2. Perspectives on Offsets

2.1 Who Really Pays for Offsets?

Do offsets increase the price of the weapon system? The answer is almost always *yes*; offsets increase the price of the weapon system by imposing added costs.

The cost of offsets is difficult to measure and varies greatly in different situations, but it can be substantial. For example, if a foreign subcontractor is substituted for an established U.S. subcontractor, the cost of the *first 100 units* the foreign subcontractor produces will (in theory) be higher than the *last 100 units* produced by the U.S. firm. The actual cost difference, including the cost of qualification, is dependent on the level of prior experience and know-how existing within the foreign firm and, ultimately, the volume of work to be performed. The foreign subcontractor will probably never reach the volume levels of the U.S. counterpart, and therefore, will have higher unit costs for the lower volume of units produced.

The foreign government may subsidize the foreign subcontractor by various methods, which lowers the cost to the U.S. prime and the weapon system. Nonetheless, the subsidy is still a cost incurred by the foreign government and ultimately the foreign population, and therefore is just as real an offset cost had it instead been passed through by the U.S. prime.

The unit production cost curve starts at a high level with production of the first unit and then slopes downward at a decreasing rate for each additional unit until, at some point, it will start upward again. This is known as the *marginal cost curve* (i.e., cost of the last unit produced). The average cost *of all units* also falls as progressively cheaper units are produced. However, at some point, the marginal cost and average cost curves intersect, and this is the lowest average unit cost achievable using current technology, factory layout, and labor inputs. The least cost plant configuration can vary greatly by engineering design. For example, an auto assembly plant's lowest average unit cost may be engineered into the plant at about 200-250,000 vehicles per year.

Military weapon-system production lines, such as aircraft, do not use mass production techniques, but instead design production to minimize cost related to maximum anticipated yearly deliveries. Also, the *relatively* small quantities ordered by the military

raise the cost per unit, making overall cost more sensitive to changes in unit volume. Thus, the larger the order quantities the more dramatically the per unit cost falls. The U.S. producer of the weapon system may subcontract additional work to the foreign subcontractor for the same weapon system on sales to other countries or sales or upgrades to the U.S. Defense Department. The greater volume will reduce the foreign contractor's costs. Also, the aftermarket, which can last 20-30 years into the future, can provide additional opportunities for the foreign subcontractor, certainly for those systems in his own country, but including bids for replacements in the United States. In addition, if the foreign subcontractor's performance is outstanding, the American prime may establish a longer-term relationship and use the firm on other projects as a primary source.

The United States also pays for offsets. Again, the volume of production is critical to cost structure across all part and component suppliers and production lines. The fact that the United States orders the most aircraft pushes the unit cost of aircraft down the cost curve. Additional unit cost savings can be achieved by exporting the system, which of course, is the classic reason market-driven trade takes place at all. However, as discussed above, direct offsets can quickly nullify these gains. Assuming offsets can be anticipated, especially now that many countries have formalized policies, the intelligent U.S. subcontractor would bid a higher price for a given part or component to begin with rather than risk losing money resulting from offsets. These added costs, though hidden, will be passed on to the U.S. Defense Department.

Non-defense indirect offsets are less distorting to U.S. weapon systems. However, they do present the U.S. exporter with administrative costs and the unnatural job of marketing a variety of goods for which he has no particular expertise. These costs must be recouped in the price of the weapon system to the foreign purchaser. Also, the widely distributed, mostly negative effects these indirect offsets have on U.S. competitor firms are largely untraceable and almost impossible to assess. Only anecdotal evidence exists, and while most of this evidence reflects a negative impact, a minor portion is also positive.

Another cost to the U.S. taxpayer is the publicly funded research and development that went into the weapon system, but not recaptured by the U.S. prime when exporting the weapon system to a foreign government. The Defense Department typically waives this cost. This policy affects exports that are offset as well as those that are not. However, with offsets some of the advanced technologies incorporated in the weapon system may be transferred to the foreign purchaser essentially free of charge. This issue needs further exploration.

Offsets penalize both the foreign purchaser and U.S. taxpayers. Then, why offset? If given the opportunity, foreign national governments prefer to spend national budgets domestically. By offsetting the high-priced import of a major weapon system, a government can redirect expenditures back into its domestic economy up to the value of the offset agreement. So, instead of spending the money abroad, it is actually spent at home. Moreover, the offset may also help promote or preserve an indigenous defense base, infuse new technology into the economy, or introduce domestic firms to potential export partners.

2.2 Co-production Agreements

In economic terms, co-production is perhaps the most inefficient and costly form of offset. Co-production puts a far heavier financial burden on the purchasing country than would the outright purchase of the weapon system. In spite of this, its justification is touted on national security grounds or national aspirations. Presumably, much, if not all, of the research and development work is already accomplished when a co-production agreement is negotiated. This would be a savings to the foreign co-producer. Depending upon the specific terms of the agreement, technical data may be transferred to the purchasing country with or without compensation so that a duplicate assembly facility can be established in the purchasing country. The details of part and component sourcing may also be negotiated.

While many nations may prefer self-sufficiency in armaments production, for almost all countries the cost is prohibitive. Implicit in a nation's decision to purchase foreign weapon systems is the cost of home production vs. cost of overseas purchase. This gives military trade an economic dimension. However, other national aspirations or internal politics sometimes interfere with the decision.

Co-production deprives the original producer of production volume, while creating a clone facility in a foreign country. The production volume of aircraft in the clone facility will almost certainly be (much) less than in the original producer's facility. This establishes a higher average cost structure in both the clone facility and in the original producer's facility, whose production volume decreases by an amount equivalent to that co-produced.

In the 1980s, the Japanese co-produced about 200 F-15s at an estimated 250 percent the cost of purchase from the U.S. producer. Is Japan more secure? That can be debated. Did they achieve their national aspirations? Perhaps, but the cloned facility had very

limited market potential. Once production was finished, its useful life was over and it would require a new infusion of capital to restore viability in some other area.

Other examples abound. Japan's co-production of 130 F-2 (formerly the FSX) fighter aircraft (a hybrid of the F-16) may ultimately cost the country about $100 million per plane vs. $20 million per aircraft if purchased from the United States. Japan's economy is large enough to absorb this added cost, and presumably the experience will help their ambitions to develop a commercial aircraft industry. This remains to be seen. Additional co-production agreements for the F-16 with the European Participants Group (Belgian, Netherlands, and Norway) and Turkey also resulted in cost penalties to the co-producer countries, while reducing business for the U.S. prime. Another co-production program in Egypt was completed in early 1998. Egypt had a co-production program for 555 kits of the M1A1 Abrams Tank for final assembly, and is now trying to convert the facility to commercial operations. In general, the more expensive the weapon system, the lower its overall volume is likely to be and the less economic sense it makes to co-produce.

Turkey recently eased its offsets policy (*Defense News*, June 29-July 5, 1998, page 4), in part to encourage more international arms traders to form joint ventures with domestic defense firms. While Turkey's objective remains the establishment of a stronger domestic defense infrastructure, the Turkish Government recognized that offsets as currently structured added costs and inefficiencies to weapon systems. It is hoped that this policy will generate foreign investment and an infusion of technology transfer. This may reduce future direct co-production type arrangements with their inflated prices.

2.3 Military Export Contracts

The U.S. State Department is responsible for issuing licenses for the export of defense items covered under the International Traffic in Arms Regulations. In each of the last several years, State has issued about 45-50,000 licenses (for 4-year validation periods) with a total value ranging from $20-30 billion. These licenses were issued to private U.S. firms to export items covered by the "munitions list," for what can be called commercial military exports. The foreign buyer could be a public or private entity.

The majority of State-licensed military export orders are written for less than $1 million, *and most are between private firms*. The great majority of these fall below the offset reporting threshold. However, most of these likely do not include formalized offsets because of their generally low value and the involvement of private entities. Still, much

of this business may include replacement parts or service items related to major weapon systems exported previously, which could have included offsets.

The average commercial military export license was for roughly $600,000. However, the median (middle value) is much lower, at under $100,000. A few licenses may be for over a billion dollars, although most of the higher values go the Foreign Military Sales (FMS) (i.e., government-to-government) route. Larger contracts are almost always negotiated with a foreign government, and are more likely to include offsets. It is not known how much of the $20-30 billion is actually exported, but much of it is ultimately cancelled. Licenses are frequently acquired simply to have them ready should an emergency shipment become necessary. Also, it is often difficult to accurately plan four years out, but it is better to err on the high side and acquire a license for the greater estimate.

A review of FMS agreements, published by the U.S. Defense Security Assistance Agency, indicates 8,672 FMS agreements totaling over $65.6 billion were entered into between FY 1993 and FY 1996. Over the same period actual FMS deliveries equaled $44.7 billion, indicating that many cancellations, perhaps as much as one-third of the business, probably have occurred or will occur. The average export agreement was for less than $7.6 million. However, this average is several times as large as the median FMS value, which would actually place the great majority of the FMS offset agreements below our reporting threshold.

By comparison, BXA received reports on 173 offset agreements supporting export contracts valued at $29.1 billion entered into between FY 1993 and FY 1996. These included both commercial and FMS agreements. The four-year average export contract was $168.4 million, although this varied a great deal from one year to the next. This implies that a small percentage of the total FMS export contracts and a smaller fraction of the commercially licensed exports are offset. However, even the contracts that are offset are very large and represent at least an estimated 30-40 percent of the total dollar value of military exports.

This conclusion is reinforced by various known country thresholds at which formal offsets are implemented. Appendix D in BXA's 1997 *Offsets in Defense Trade* report included information on the export dollar value at which selected countries require offsets. The 15 cited thresholds ranged from Israel's low of $500,000 to $50 million for Taiwan. The average value was $7.9 million and the median, $1.7 million. Three countries' thresholds were less than $1 million.

The United Kingdom, which alone accounted for more than 30 percent of total new offset agreements between 1993 and 1996, has a high threshold of $16 million. Britain is also one of the major destinations of defense products licensed by the State Department. Israel, with a lower threshold, has a low percentage of new agreements (2.4 percent), but a high percentage of offset transactions (8.9 percent). Some of these transactions emanate from agreements entered into prior to 1993. Others could be from agreements below BXA's $5 million reporting requirement.

2.4 Aerospace Dominates Offsets

Offset agreements are overwhelmingly tied to aerospace exports. With literally tens of thousands of parts and components per aircraft and an abundance of advanced technology, from the purchaser's view aerospace products offer ample opportunities for offsets. BXA's database (1993-1996) indicates that 91.1 percent of the dollar value of all new offset agreements ($13.8 of $15.1 billion) were written against aerospace exports. The aerospace export contracts these offset agreements referenced, were 91.8 percent ($26.7 of $29.1 billion) of all the export contracts. The percentage of offsets to aerospace export contracts averaged 51.6 percent.

Offset transactions told a similar story. Offset transactions referenced aerospace weapon system exports 92.7 percent ($8.56 of $9.23 billion) of the time. However, only 53.7 percent of offset transactions themselves were identified as aerospace products. This means that aerospace exports are frequently offset by non-aerospace products. The transaction breakout was $4.96 billion aerospace, $4.16 non-aerospace, and $0.11 unknown products. If just aerospace exports are matched to aerospace transactions, the relationship is about 58 percent ($4.96/$8.56 billion).

It is also evident that a very high percentage of *all* exported military aircraft, engines, and missiles are offset. Estimates of aerospace exports published in the Aerospace Industries Association's 1998 *Facts and Figures*, indicate roughly $14.8 billion of these systems were exported from 1993 to 1996. Judging from BXA's total of $26.7 billion in export contracts that were offset over the same period with an average term of about seven years, its apparent offsets played a major role in moving these items.

In addition to the $14.8 billion in major system exports, AIA reported that $18.9 billion in (military) parts and components were exported. Exports of major U.S. weapons systems generate a future flow of parts exports to the after market. A large (but unknown) portion of the parts trade is accounted for in this way. In addition, foreign

production of new systems, and the after market for those systems also generates parts exports from the United States. However, the parts trade is understated because of the wide cross-section of industries that feed parts into aerospace systems (e.g., software, forgings, ammunition, tires, etc.), but that are not captured as such in the official trade statistics.

2.5 Effects of Defense Industry Consolidation on Offsets

Mega-mergers and consolidations within the U.S. defense establishment have reduced the number but increased the average size of companies reporting offset activity. Some companies continue reporting under their old names, and others report as divisions of the new parent corporation. Of the 32 companies reporting new offset agreements at any time during 1993-1996, 11 have now merged with others. These same 11 are also included among the 34 reporting offset transactions. In 1993, 18 companies or divisions reported new offset agreements. In 1996, the number was 15, four of whom were now parts of larger firms.

Aside from reducing the number of firms reporting offsets, the consolidation trend could have more profound effects on offsets. Under one scenario, the stronger competitive position of merged U.S. defense prime contractors poses an increased threat to European defense firms. The stronger presence of U.S. firms and the shrinking global defense market could foster a more rapid consolidation among European defense producers and lead to a degree of isolation. One indication that this is already happening is the Eurofighter 2000, an effort by four European nations to reduce dependence on the United States. Consolidation in Europe could reduce the international market potential available to U.S. firms and in so doing reduce offsets.

However, rationalization and consolidation of defense assets has not proceeded at the European level. Rather, individual countries have done so primarily on their own, resulting in a surplus of defense assets, with numerous redundancies across Europe. A more likely scenario is that defense budgets will drop further, and consequently reduce the market for U.S. weapon systems. Such a drop would have little connection to consolidation.

Under a rosier scenario, company consolidations could extend across national borders and increase the participation of foreign entities in the development and production of new U.S. weapon systems. This could also occur by partnering or joint venturing, as well

as by acquisition, with foreign entities. For example, the Joint Strike Fighter program seems to be evolving into a multi-nation program without offsets. Currently, the program has US, UK, Dutch, and Canadian participation. In other areas, the UK's General Electric Company recently acquired Tracor. In the last decade, the UK's Lucas Aerospace (now part of Rolls-Royce) purchased Western Gear, and Rolls-Royce bought Allison Gas Turbine.

It's also conceivable the U.S. and allied foreign governments will encourage such developments, and combine defense budgets to develop future weapon systems. This would spread costs and benefits across borders, and help eliminate redundancies. Assuming all participants share in costs and profits, it would also provide incentives to market the system as widely as possible. Offsets would then be less of a factor, except in sales to third parties.

In another scenario the U.S. Government could elect to develop and produce weapons domestically on national security grounds. This option may be a more expensive choice in light of the increased complexity and cost of the latest aircraft. It may also serve to increase offsets above current levels, particularly in aerospace defense trade, assuming a higher proportion of ultimate production of aircraft may be exported than in the past.

2.6 Historical Review, 1980-1996

The Office of Management and Budget (OMB) was responsible for reporting on offsets under the Defense Production Act (of 1950), Section 309, beginning in 1984. Acting under that authority in 1988, OMB tasked the U.S. International Trade Commission (ITC) to collect offsets data from Defense prime contractors for the years 1980 through 1984. The collection required a response from the prime if any military export sales contract valued at $500,000 or more was countered by an offset agreement of any magnitude. ITC sent a mandatory survey to 52 Defense prime contractors, of whom 36 returned completed surveys. A similar data collection, also covering 1980 through 1987, was made by the Commerce Department's Bureau of Economic Analysis for OMB a few years later.

BXA's offsets database differs from OMB's information in method of collection and minimum value reporting requirements. Military exporters are required to submit a report annually to BXA for any offset agreements (as opposed to export sales contract)

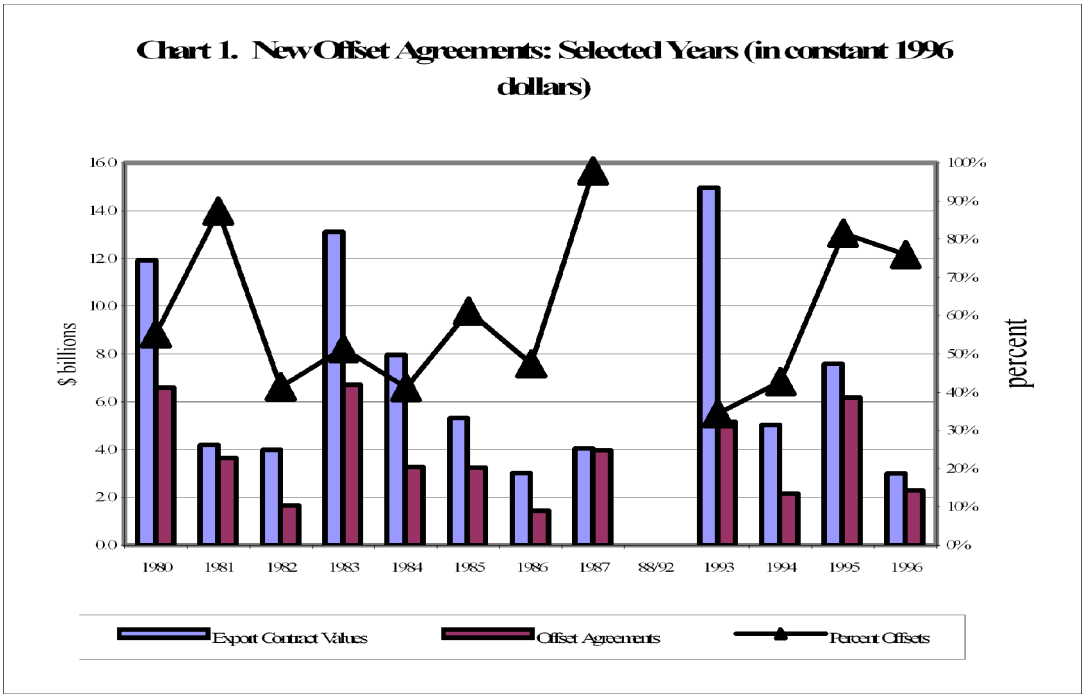
valued at $5 million or greater and/or offset transactions valued at $250,000 or more. The export contract value is also reported, but its size is incidental. BXA has reports from 32 companies as opposed to OMB's 36 companies, which reported to OMB before defense downsizing and consolidation reduced the number of companies.

OMB published this information in December 1988 in their *Offsets in Military Exports* report. The OMB information was restated and summarized in the Commerce Department's first offsets' report, *Offsets in Defense Trade*, published in May 1996. BXA combined the OMB information with offsets' data submitted by Defense prime contractors for 1993 to 1996. No offset data was collected from 1988 to 1992.

Chart 1 below includes OMB's offset data and that received by BXA. The data is presented in constant 1996 dollars using the Commerce Department's 1996 GNP deflator as calculated by the Bureau of Economic Analysis. Three elements are shown on the graph: the value of export sales contracts (the gray bar); the value of offset obligations (the black bar); and the percent offset obligations to the value of export sales contracts (the line with arrowheads).

The chart shows the great changeability in annual data for all three variables. For example, the percentages of offset obligations to new export contract values have been less than 35 percent (1993), and greater than 98 percent (1987). In a year, just one or two large contracts can have a major impact. In 1993, an export contract of nearly $6 billion was negotiated with Taiwan with limited offsets. If this particular sale were removed, the overall percentage of new offset obligations would jump from 34.5 percent to 52.1 percent in 1993. Similarly, removal of a major Middle Eastern sale that same year would push the offset obligation to nearly 70 percent.

Invariably, higher offset percentages are correlated with greater concentrations of offset activity in Europe and other developed nations. In both 1995 and 1996, European nations accounted for over 80 percent of total new offset obligations and a majority of the export contracts. This is in contrast to less than 50 percent in the two prior years. However, for the latter two consecutive years the percentage of offsets remained greater than 75 percent for the first time.



Source: *Offsets in Military Exports*, OMB, and BXA's Offset Reporting Data

The overall offset to export contract ratio for the eight years from 1980 to 1987 was 57 percent. This compares with 52 percent for the four years from 1993 to 1996. However, the cumulative average percent of obligations rose each successive year after 1993 as more activity was focused on Europe. This may indicate offset obligations over time converge around the 50-60 percent range. If the OMB data were broken into two consecutive four-year periods, both offset subtotals would range in the 50-60 percent range (i.e., 56 percent from 1980-83, and 59 percent from 1984-1987).

3. STATISTICAL ANALYSIS

3.1 BXA Data, 1993-1996

BXA now has four years of offsets data. In deference to the reader, more graphics are utilized in this report to present this data. Also, greater emphasis is placed on analysis of four-year totals and averages. Year-to-year changes in offset variables are highly volatile and unpredictable. Longer time periods help to moderate this volatility and perhaps offer a truer picture of offset trends and impacts. However, key annual data will continue to be reported.

The four regions - Europe, Middle East, Pacific Rim, and Other Areas – used to present the offsets data in the last two BXA offsets reports were selected on the basis of data then available and to protect company proprietary data. It is now apparent that this arrangement is no longer necessary, especially in 1995 and 1996, when European offsets overwhelmingly dominated the data. With four years of data, selected country data can now be referenced without disclosing company proprietary data.

Data Qualifications

The BXA data from 1993 to 1996 contains: 1) new offset agreements valued at $5 million or more [Of 173 agreements, BXA received seven agreements for less than $5 million and four others where no offset value was reported. These agreements do not significantly impact the overall totals.], 2) export contract values related to these new agreements, and 3) offset transactions valued at $250,000 or more completed during the reporting period. [Of 2,277 transactions BXA reviewed, 251 had actual values of less than $250,000. Thirty-one transactions had negative values, which were mostly accounting adjustments to previous reports, or cancellations of reported transactions. There were also 17 zero actual value entrees, but most of these had large credit values. The effect of these 251 transactions was to reduce total actual transactions by a net $45.6 million, and increase credit transactions by $330.3 million.]

Offset Transaction Analysis

Description	#	Actual Value	Credit Value
Negative Values	31	($64,888,000)	($64,896,000)
Zero Actual Values	17	$0	$152,376,000
Less than $250,000	203	$19,321,695	$242,810,001
Net Total	251	($45,566,305)	$330,290,001

3.2 Summary

During 1993 to 1996, 32 U.S. companies reported entering into 173 new offset agreements with foreign governments equal to $15.1 billion. They had an average term of 87 months, or 7.25 years. The agreements supported $29.1 billion in export contracts, and were concluded with 28 countries to complete the offsets. In the aggregate, the offset agreements represented more than 52 percent of the export contract values.

A total of 34 U.S. companies reported 2,277 offset transactions valued at $9.2 billion, for which they received offset credits of $10.7 billion. These transactions were executed in 31 countries. About 38 percent of the value of the transactions were direct offsets, 58 percent indirect, and 4 percent unspecified. About 73 percent of the transactions' value were subcontracting activity, purchases, or technology transfer. Roughly two-thirds of the transactions referenced offset agreements that predated 1993; the remaining third were against agreements struck in 1993 or later.

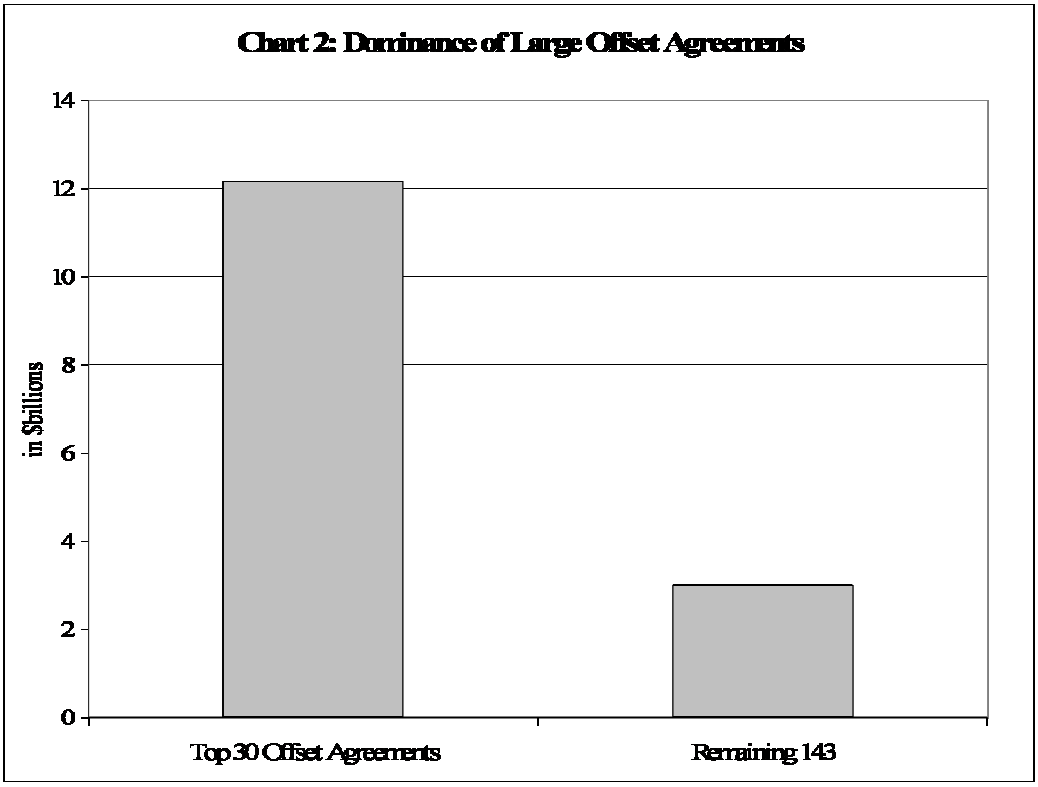
3.3 Concentrated Nature of Offset Activity

Five U.S. companies accounted for over 78 percent of the value of new offset agreements, and nearly 82 percent of export contract values. More than 70 percent of the new agreements' value were concluded with just five countries, and about 80 percent with just eight countries. The largest 10 percent of new offset agreements represented 68.5 percent of the total value of all new agreements, while the top 10 percent of export contracts were 72.5 percent of total export contracts. In addition, just 10 of 103 weapon systems referred to in the export contracts accounted for 65 percent of export contract values, and 64 percent of the value of new offset agreements.

Offset transactions are also concentrated. Five companies reported 80.5 percent of the total value, and nine reported over 91 percent. Also, five (of 32) countries accounted for 58 percent of all transactions, and eight for 72.5 percent. In addition, just five of the 150 different weapon systems referenced in the offset transaction reports accounted for 53.4 percent of the total transaction value. The top 10 (of 922) offset recipients, including public and private entities, accounted for 24 percent of the value of total transactions.

Chart 2 below is a bar graph that compares the largest 30 offset agreements to the remaining 143 agreements. The number of agreements in each category is reflected on the x-axis and the dollar value (in $billions) on the y-axis. The top 30 agreements totaled $12.2 billion, or over 80 percent of all agreements. The other 143 agreements totaled

$3.0 billion. Offsets as a percentage of export contracts were about the same for the two groups; 51.7 percent for the largest 30 agreements, and 53.3 percent for the smaller 143 agreements.



Source: U.S. DOC/BXA Offset Database

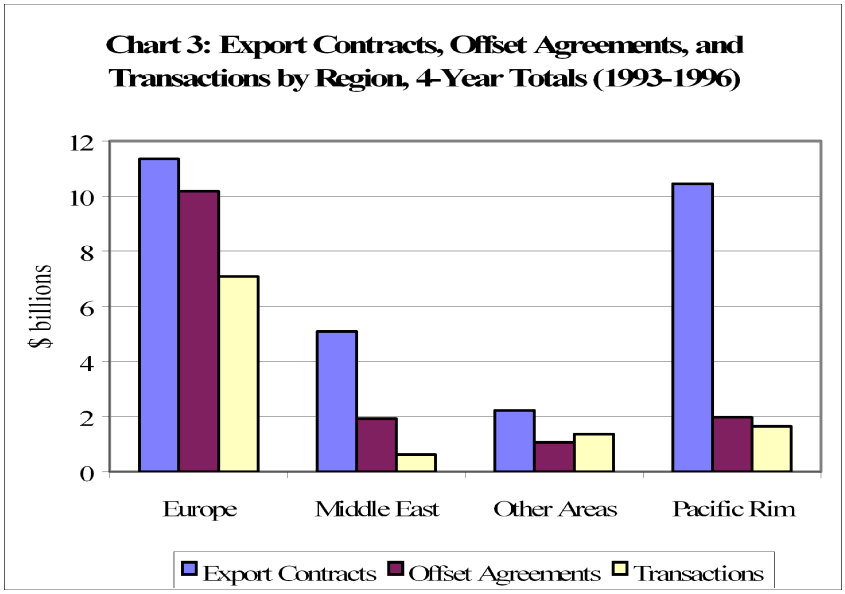
Note to Chart 2

Statistically, the mean of the 173 offset agreements was $87.6 million, but the distribution has a very large average deviation of $110 million and even larger standard deviation of $236 million. This raises the question of whether these agreements could better be described as separate categories based on value as shown in Chart 2. Also, the median (or middle) value, between the 86th and 87th agreement, was about $17.5 million, or only one-fifth of the mean, revealing the obvious: a very top-heavy distribution. If these parameters were based solely on the smaller 143 agreement group, the average deviation would drop to about $15 million and the standard deviation to $21 million. The mean would be just under $22 million, and the median, $14.5 million.

Among regions, Europe dominates the global totals. In four years, European countries entered into 94 new offset agreements valued at more than $10 billion. The agreements countered about $11.3 billion in export contracts. New offset obligations with European nations were more than 67 percent of the total dollar value of all new offset agreements.

These were attributed to less than 40 percent of all new export contracts. Non-European areas collectively contracted to purchase $17.8 billion in U.S. weapon systems, and countered these with $5 billion in offset agreements. These offsets were only 28 percent of export contracts, in striking contrast to the 90 percent for Europe. Two large export contracts mentioned previously accounted for nearly $10 billion (or 56 percent) of the non-European total export contracts, and each had low levels of offset requirements.

Chart 3 below presents a four-year summary of offset-related defense trade on a regional basis. The chart includes export contracts, new offset agreements, and transactions for the regions, and clearly shows Europe's dominance in both new agreements and transactions, along with its proportionately smaller share of export contracts. The large 1993 export deals with Taiwan in the Pacific Rim and Saudi Arabia in the Middle East are also reflected on the chart.



Source: U.S. DOC/BXA Offset Database

The Other Areas Region (i.e., Israel, Canada, Australia, and New Zealand) shows a greater value for transactions than new obligations. Since most transactions are based on offset agreements entered prior to 1993, this simply indicates a slow down in defense purchases and related offset activity during the 1993-1996 period. Of all the regions, only Europe appears to have fairly balanced proportions between new agreements and offset transactions, perhaps due to the large number of agreements and transactions that would seemingly smooth out distortions. However, it could also indicate Europe has stricter offset enforcement policies.

3.4 New Offset Agreements: Summary

Table 1 presents an annual summary of new offset agreements by region.

Table 1: New Offset Agreements, 1993 to 1996

Region	Deals	Export Contracts	Offset Agreements	% Offsets	Terms
1993		**$millions**	**$millions**		**months**
Europe	14	2,985.0	2,338.1	78.3%	84
Middle East	4	4,143.9	1,462.1	35.3%	96
Other Areas	4	98.5	50.5	51.3%	83
Pacific Rim	7	6,717.7	943.8	14.1%	78
Total	**29**	**13,945.0**	**4,794.4**	**34.4%**	**84**
1994					
Europe	20	1,508.2	764.8	50.7%	88
Middle East	6	819.2	417.3	50.9%	88
Other Areas	14	549.5	358.4	65.2%	63
Pacific Rim	9	1,915.4	508.1	26.5%	72
Total	**49**	**4,792.4**	**2,048.7**	**42.8%**	**78**
1995					
Europe	26	4,944.3	5,159.2	104.4%	104
Middle East	2	68.7	26.4	38.4%	72
Other Areas	9	1,378.9	547.1	39.7%	76
Pacific Rim	8	1,010.1	301.3	29.8%	80
Total	**45**	**7,402.0**	**6,034.1**	**81.5%**	**93**
1996					
Europe	34	1,924.1	1,919.1	99.7%	104
Middle East	1	50.0	25.0	50.0%	90
Other Areas	8	206.6	106.6	51.6%	75
Pacific Rim	7	807.1	220.0	27.3%	53
Total	**50**	**2,987.8**	**2,270.7**	**76.0%**	**92**
4-Year Totals					
Europe	94	11,361.8	10,181.3	89.6%	98
Middle East	13	5,081.8	1,930.8	38.0%	88
Other Areas	35	2,233.5	1,062.7	47.6%	71
Pacific Rim	31	10,450.3	1,973.2	18.9%	71
Grand Total	**173**	**29,127.3**	**15,147.9**	**52.0%**	**87**

Source: U.S. DOC/BXA Offsets Database

The value of 1996 new offset agreements was down sharply from 1995, and well below the four-year averages. In 1996, reported new agreements of $2.27 billion supported $3 billion in new export contracts. New offset agreements were down over 60 percent from the $6 billion reported in 1995, and more than 40 percent below the (four-year) average of $3.8 billion. Europe was again the dominant player, with $1.92 billion (or 85 percent) of the 1996 new agreement total. Europe's new offset obligations represented almost 100

percent of the export contracts ($1.92 billion) they referenced. This percentage was down slightly from the 104 percent Europe logged in 1995. The 1995 agreements' data was unusual in that it was dominated by three very large offset agreements U.S. firms negotiated with European nations. These three agreements alone were nearly two-thirds of that year's total.

Worldwide, new offset agreements as a percent of export contract values fell to 76 percent from about 81 percent in 1995. The 1996 figure, however, is considerably higher than the four-year average of 52 percent. The 1995 and 1996 percentages of offsets to export contract values were the third and fourth highest levels recorded since 1980. The large differences in these numbers are explained in part by the major regional and national differences in offset requirements, combined with the apparent random occurrence of export sales to any of those places.

As part of the offsets reporting requirement, U.S. prime contractors were requested to provide the name and title of the signatories to the new offset agreements. Of the 173 new agreements reported from 1993-1996, 116 included foreign signatories information. Table 2 lists the number of signatories that were foreign companies, and those that were foreign government entities, either civil or military.

Table 2. New Offset Agreements Signatories by Category

Foreign Company	9	7.7%
Foreign Government – Civil	54	46.6%
Foreign Government – Military	53	45.7%
Total	116	100.0%

Source: U.S. DOC/BXA Offsets Database

These organizations ranged from very large to small firms, and included several dozen foreign government agencies, mostly from South Korea, Australia, and Greece. Government entities were about evenly split between defense and civilian agencies. Some countries, such as Israel and the Netherlands, had military subdivisions located within civilian ministries that were listed as signatories. These were counted as civilian agencies. Government entities were listed under various names, such as the Ministry of Defense, Ministry of Economic Affairs, Department of Industrial Development,

Committee for Aviation and Space Industry Development, and several scientific research institutes.

Military entities comprised 46 percent of the signatories while non-military signatories totaled 54 percent. The non-military entities were either foreign companies or civil government entities. While the new agreements reports received by BXA did not include the split between direct and indirect offsets, based on country transactions data no correlation was evident between the level of direct offsets and the foreign signatory's affiliation to military or civilian government agencies.

Table 3 presents signatory information for selected countries. The countries shown represented about $9.1 billion of the value of all new offset agreements, or almost 60 percent. Offset transactions for these countries totaled $4 billion, which by comparison is only 43 percent of all transactions, which indicates this percentage will increase in the future. However, because of the presence of the United Kingdom, Israel, and South Korea, these countries have a higher incidence of direct offsets at $1.96 billion (about 50 percent) than contained in the overall figures (38 percent), which implies that direct offsets will also increase.

Table 3. Selected Country Signatory Profiles

Country	Total # of Agreements	Foreign Signatory Affiliations			
		Military	Civil	Private	Unknown
United Kingdom	19	15	1		3
Netherlands	13		12		1
Switzerland	5	1	2		2
Israel	16	1	7		8
South Korea	12	6	2		4
Canada	13	2	8	1	2
Totals:	78	25	32	1	20

Source: U.S. DOC/BXA Offsets Database

3.5 Offset Transactions

Table 4 summarizes offset transactions from 1993-1996. During these four years, 34 companies reported 2,277 transactions to 922 different offset recipients in 31 different countries. [In addition to the 31 separately identified countries, a small number of transactions ($45.7 million or less than 0.5 percent) were reported for NATO, the European Participating Group (Belgium, the Netherlands, and Norway), and for Sweden/Norway combined.] The transactions referenced 150 different weapon systems.

The value of these transactions was $9.2 billion, with a credit value of $10.7 billion. About two-thirds of the transactions were based on offset agreements written before 1993. Of the 103 weapon systems in new offset agreements in the BXA database (1993 and later), 78 have reported transactions.

European countries accounted for 64.2 percent of the actual value and 66.3 percent of the credit value of total transactions. The top five European countries - Finland, the United Kingdom, Switzerland, the Netherlands, and Spain - accounted for 51.3 percent of the (actual value) world total and almost 70 percent of the European total. Israel, South Korea, Turkey, Germany, and Canada, along with the five listed European nations, make up the top 10, and collectively account for nearly 80 percent of the world total. NATO countries accounted for $3.95 billion (43 percent) of the transactions value.

Table 4: Offset Transactions Summary, 1993-1996

Transaction Data	1993	1994	1995	1996	4-Year Total
# of Companies Reporting	23	21	20	21	34
# Reported Offset Transactions	439	550	667	621	2,277
# of Different Countries Reported	26	25	25	25	31
# of Different Weapon Systems	63	61	73	78	150
# of Different Transaction Recipients	259	318	373	367	922
	# Offset Transactions by Region				
Europe	296	355	410	401	1,462
Middle East	16	22	36	30	104
Other Areas	82	94	161	126	463
Pacific Rim	45	79	60	64	248
	Offset Transactions by Region (in $millions)				
Actual Values: Total	$1,814.9	$1,891.1	$2,661.0	$2,862.4	$9,229.4
Europe	$1,377.1	$1,149.5	$1,767.2	$1,828.9	$6,122.7
Middle East	$53.3	$47.3	$135.5	$217.8	$453.9
Other Areas	$211.7	$282.3	$484.6	$357.9	$1,336.5
Pacific Rim	$172.8	$412.0	$273.7	$457.8	$1,316.3
Credit Values: Total	$2,155.1	$2,161.5	$3,333.4	$3,066.9	$10,716.8
Europe	$1,609.1	$1,277.4	$2,076.1	$2,117.2	$7,079.8
Middle East	$116.7	$109.9	$159.3	$229.6	$615.5
Other Areas	$249.9	$283.6	$481.0	$358.2	$1,372.7
Pacific Rim	$179.4	$490.5	$616.9	$361.9	$1,648.7

Source: U.S. DOC/BXA Offsets Database

In 1996, a total of 621 offset transactions valued at $2.86 billion were reported, with a credit value of $3.07 billion. The 1996 values were the largest for transactions for the four years, and capped off four years of steady increases. The 1996 value was almost 8 percent more than 1995 values, although this was not as dramatic as the 40 percent increase observed between 1994 and 1995.

European nations accounted for the bulk of the value of offset transactions for the fourth consecutive year; in 1996 about 64 percent were with Europe. Direct offset transactions rose to about 43 percent in 1996, up from the 40 percent recorded the prior year. This was largely accounted for by substantial increases in subcontractor activity in Europe, especially in the United Kingdom, and a very large jump in *direct* technology transfer to the Pacific Rim. The European increases in subcontractor activity were moderated somewhat by a large decrease in the "Other Areas" region (Israel, Canada, and Australia).

The 1996 offset transactions reports were based on 78 different exported weapon systems, seven of which appeared for the first time.

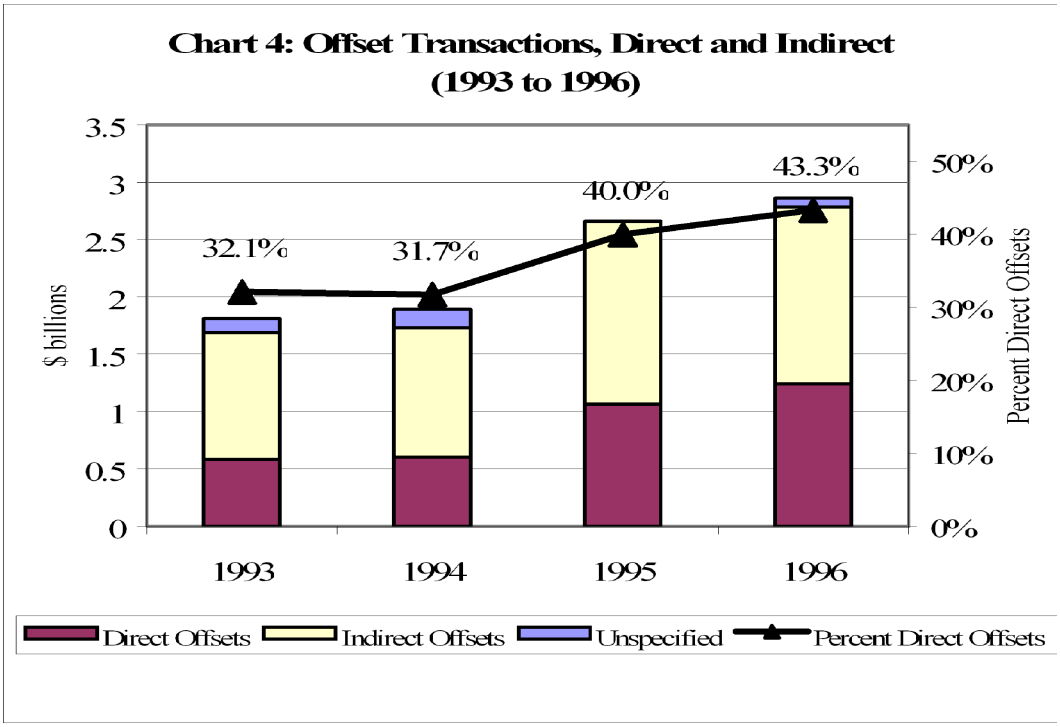
3.5.1 Offset Transactions by Type

From 1993 to 1996, 37.8 percent of the offset transactions were direct, 58.2 percent were indirect, and 4 percent were unspecified. *Chart 4* shows offset transactions by type of offset for each year from 1993 to 1996. Along with total transactions, the value of direct transactions rose each year. Total transactions increased most sharply between 1994 and 1995, when they rose from $1.89 to $2.66 billion, a 41 percent jump. That year very steep increases were reported for both the United Kingdom and Israel. Both nations had a high level of direct aerospace offsets, which is why direct offsets shot up from about 32 to 40 percent that year. Direct offsets rose again in 1996 for the same reason.

The absolute increase in 1995 in direct offset transactions was over $400 million ($600 million to $1.06 billion), a 77 percent increase. Indirect offset transactions also rose by a substantial amount from $1.13 to $1.6 billion (up 42 percent), which partly balanced out the direct increases. The nearly $500 million jump in indirect offsets was due to large increases in transactions from Finland, Switzerland and Malaysia.

Countries varied widely in how offset transactions were allocated between direct and indirect. The allocation was often closely linked to the size of the country's indigenous aerospace sector. Generally, countries with established aerospace sectors tended to fulfill offsets with aerospace products; and these were most often *direct*. In fact, almost two-

thirds (63.1 percent) of all aerospace product transactions ($3.13 of $4.96 billion) were direct offsets. Moreover, aerospace products accounted for 90 percent of all direct offsets. This is entirely consistent with the 90 percent plus exports of aerospace weapon systems that offset transactions refer back to.



Source: U.S. DOC/BXA Offsets Database

About 29.9 percent of aerospace products offsets ($1.48 of $4.96 billion) were indirect, and the remaining seven percent ($348 million), *unspecified* (i.e., direct or indirect portions unknown) transactions. Total aerospace product offset transactions ($4.96 billion) represented 53.7 percent of all transactions ($9.23 billion). About $49 million (1 percent of the total) of aerospace product transactions referenced to non-aerospace weapon system exports; this accounted for 7.4 percent of the $662 million in transactions referenced to non-aerospace system exports.

Countries with smaller aerospace sectors tended to offset more frequently in non-aerospace areas, and most of these transactions were indirect. *Offset transactions identified as non-aerospace products accounted for about 70.4 percent of total indirect offsets* ($3.78 of $5.38 billion). Indirect aerospace transactions accounted for most of the remainder (27.6 percent) and the *unknown industry category* the rest (2 percent). The

$368 million in unspecified offset transactions were mostly aerospace products (94.8 percent). *Table 5* summarizes the above information.

Table 5: Offset Transactions by Industry Group and Type 1993-1996 Summary (actual values)

Industry Group	Direct Offsets		Indirect Offsets		Unspecified		Totals
	$ billions	%	$ billions	%	$ billions	%	
Aerospace	$3.128	89.7%	$1.483	27.6%	$.348	94.8%	$4.961
Non-Aerospace	$0.358	10.3%	$3.783	70.4%	$.019	5.2%	$4.160
Unknown			$0.109	2.0%			$0.109
Totals	**$3.487**	**100%**	**$5.375**	**100%**	**$.367**	**100%**	**$9.229**

Source: U.S. DOC/BXA Offsets Database

Eighteen countries (of 31 total) had offset transactions exceeding $100 million during the 1993 to 1996 period. *Table 6* (next page) lists these 18 countries with percentage information shown by industry category and type offset. These 18 countries accounted for 95.8 percent of total transactions ($8.84 of $9.23 billion). The five countries with the highest value of transactions are Finland, Britain, Israel, South Korea, and Switzerland. The 18 countries are ranked on Table 5 by percent aerospace transactions of total transactions. All 18 countries had aerospace transactions. Australia is ranked first with 87.2 percent of reported transactions in aerospace related products.

Note that 34 percent of Australia's total transactions are direct transactions of aerospace products. Another 11.3 percent of the Australia's transactions are direct non-aerospace products, for a country total of 45.3 percent directs. Not all countries' category totals add to 100 percent (Taiwan for example) because of the *unknown industry category*, which is not shown on Table 6. All *unknown industry transactions*, however, were indirect offsets and represented only 1.2 percent of the total transactions.

Twelve of the 18 countries had more than half the value of their offset transactions in aerospace products; 10 had more than 60 percent, including three of the top five; and six countries, including the United Kingdom and Israel of the top five, had more than 70 percent in aerospace. For all countries, including those not listed on the table, aerospace transactions averaged 53.8 percent.

The relative share of aerospace transactions was highest in 1994, when it exceeded 60 percent. However, direct offsets were at a four-year low in 1994 at less than 32 percent.

Table 6: Offset Transactions by Type and Country Aerospace and Non-Aerospace, by Percent, 1993-1996								
Country	Aerospace Offset Transactions				Non-Aerospace Transactions			
	% Direct	% Indirect	% Unspec.	Total %	% Direct	% Indirect	% Unspec.	Total %
Australia	34.0	28.9	24.3	87.2	11.3	1.4		12.8
Belgium	82.0	2.2		84.2		15.8		15.8
Israel	56.6	7.3	14.9	78.7	0.1	20.8		21.0
Taiwan	0.4	77.4		77.8	9.75	5.0		14.7
Denmark	46.6	27.9		74.4		25.6		25.6
UK	57.6	15.9		73.5		26.5		26.5
Turkey	36.9	31.0		67.9	1.2	30.9		32.1
France	21.3	43.6		65.0		35.1		35.1
Spain	57.2	0.8	5.8	63.7		36.2		36.2
S. Korea	34.3	25.8	3.3	63.5	33.2	3.2	0.1	36.6
Canada	13.1	39.9	5.3	58.3	5.6	36.1		41.7
Netherlands	34.2	4.5	18.8	57.4	0.1	42.5		42.6
Germany	29.2	17.3		46.4	5.8	47.6		53.4
Switzerland	26.6	11.8		38.3		59.0		59.0
Norway	17.1	17.6		34.7		52.1	13.3	65.3
Finland	20.9	9.4		30.2		68.5		68.5
Greece	18.3	7.9		26.1	0.7	72.3		72.9
Malaysia		12.8		12.8	2.4	68.6		70.9
All Countries	**33.9**	**16.1**	**3.8**	**53.8**	**3.9**	**41.0**	**0.2**	**45.1**

Source: U.S. DOC/BXA Offset Database

That year Britain and Israel were not in the top five and Taiwan transactions rose rapidly due to the previous year's large export sale. The aerospace share of total offset transactions was about 51 percent in 1993 and 1995, and rose to 53 percent in 1996. Direct offsets in the aerospace category represented 33.9 percent, compared with only 3.9 in the non-aerospace sector. Six countries showed less than half of their aerospace transactions as direct (Australia, Taiwan, France, Canada, Norway, and Malaysia).

Indirect credit values were generally higher relative to actual values than were credit values for direct transactions. While *indirect* credit values were 24.4 percent higher than their reported actual values, *direct* credit values were only 12.1 percent higher. Credit values for aerospace indirects ($1.92 billion) were 29 percent higher than actual values, although most countries were well below the 29 percent figure. Five countries - Taiwan, France, Norway, Portugal, and Israel accounted for nearly all of the higher value. Credit values for direct aerospace transactions were only 1.3 percent higher than actual. Many countries showed credit values that were smaller than actual values. In comparison, non-

aerospace credit values were 23 percent higher than actual values for indirect transactions, while directs, from a very small base, were slightly more than twice as large.

Direct Offsets May be Slightly Understated

Direct offsets may be slightly understated because of the hidden "unspecified" transactions, which could be mostly direct. About 95 percent of the unspecified offset transactions ($348 of a total of $367 million) were aerospace products. About two-thirds of total aerospace transactions were direct offsets. If the unspecified offsets follow this pattern, they would increase overall direct transactions by 2 or 3 percent.

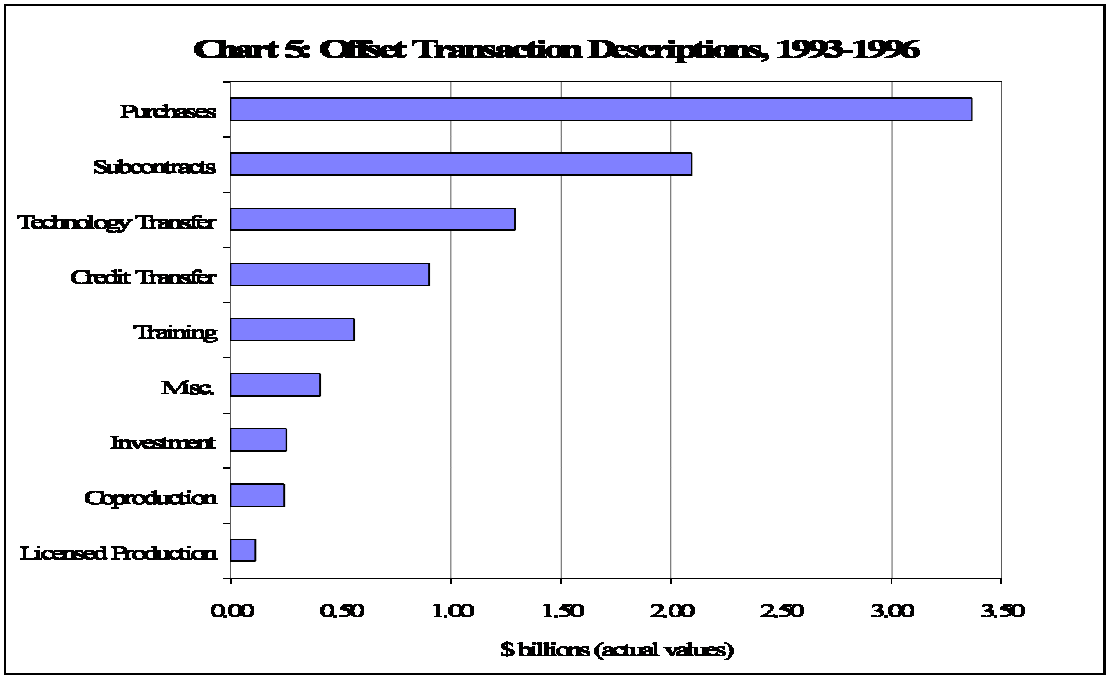
This does not negate assertions in the two previous BXA offset reports that indirect offsets have increased. If the same logic is applied to the 1988 OMB report on offsets, it may actually reinforce the assertion. The OMB report stated that during the eight years (1980-1987) direct offsets were 36.8 percent; indirect were 41.3 percent; and unspecified were 21.9 percent. If the two-thirds rule is applied to the unspecified portion, then over 50 percent of the OMB total transactions would be direct. If the unspecified were simply made proportional to the known direct and indirect, the OMB direct transaction value would still be over 47 percent, while the BXA proportional split would be 39.3 percent.

Also, it appears logical that direct offsets should be declining. With falling defense budgets and more countries shrinking their defense industries, the opportunities for direct offsets have declined. Moreover, aerospace product exporters may prefer indirect offset transactions, which are less disruptive to their companies.

Note: Co-production agreements with Japan and other countries are not included in the BXA database. Co-production is direct and would increase the direct total substantially.

3.5.2 Offset Transactions by Description

Chart 5 shows the breakdown of offset transactions for 1993-1996 by method of



fulfillment. Purchases, subcontracts, and technology transfer (in that order) dominated offset transaction activity (actual values). Their combined values ($6.74 of $9.23 billion) represented 73.1 percent of the four-year total of offset transactions. Purchases ($3.36 billion), all indirect, were more than one-third (36.5 percent) of total offsets, while subcontracts ($2.09 billion), all direct, were 22.7 percent of the total. Technology transfer was $1.29 billion (14 percent of total). Credit transfers totaled $900 million and were just under 10 percent of the total.
Source: U.S. DOC/BXA Offset Database

Purchases accounted for more than half of the number of all transactions (1,209 of 2,277), averaging about $2.78 million per purchase. Individual purchase transactions could be bundles of items, such as cellular phones, or single items such as an oil rig. More expensive purchases included computer software, a cable-laying vessel, and medical supplies. Some of the less expensive purchases were food stuffs and wire cutting equipment.

Subcontracts were a distant second with 477 reported transactions, but the average transaction was considerably higher at $4.39 million per subcontract. There were 189 technology transfer transactions and these averaged $6.82 million. Only 48 credit transfer transactions were reported, and these averaged $18.75 million.
In terms of credit values, the profile by offset description is about the same, although the top three categories are each somewhat less. The combined percentage of the top three credit values was 68.2 percent instead of the 73 percent recorded for actual values. The categories with the largest differences between actual and credit value were investment (plus 99 percent), miscellaneous transactions, which included mostly marketing or business assistance (plus 61.5 percent), and training (plus 43.5 percent). For all categories, credit transaction values were $1.49 billion more than actual values, or about 16.1 percent higher. The three with the largest multiples mentioned above represented about half the increase ($746 million), although their actual total was only 13.3 percent of overall actual transactions.

Pie Charts 6 and 7 that follow present offset transactions by type and description for the aerospace and non-aerospace sectors. Transactions not specified as either direct or indirect ($368 million) and transactions of unknown industry sector ($109 million) are not included in the charts. Together these transactions accounted for about 5 percent of the total.

Chart 6 shows direct and indirect aerospace transactions. About two-thirds of direct aerospace offset transactions ($1.99 of $3.13 billion) were subcontracts (upper left pie

chart). Subcontracts may conceal the partial involvement of licensing, technical data exchange, training or know-how transfer needed to establish qualified subcontractors. These additional costs vary from country to country and may be quite low for countries with strong aerospace infrastructures. The United Kingdom and Israel accounted for more than half the subcontracting activity, and both countries have strong aerospace subcontractors. Also, over 99 percent of both the UK's and Israel's total direct aerospace offsets were subcontracts. It appears these countries are motivated to maintain their defense infrastructures. Germany had over 83 percent of its direct transactions in subcontracts and France had 100 percent, although the French quantity was small relative to indirect offsets. Nineteen other countries had subcontract activity, but all were small quantities.

Other direct transactions included training and technology transfer, each about 12 percent. Training transactions were $380 million. These were predominantly reported in Finland, South Korea, Turkey, and the UAE, which accounted for about 88 percent of the total. Eight other countries shared the rest. Technology transfer totaled $367 million. Finland, Spain, and Switzerland accounted for about 77 percent of these offsets and nine others made up the rest.

Chart 6: Aerospace Offset Transactions by Type and Description

Direct ($3.13 billion) Indirect ($1.48 billion)

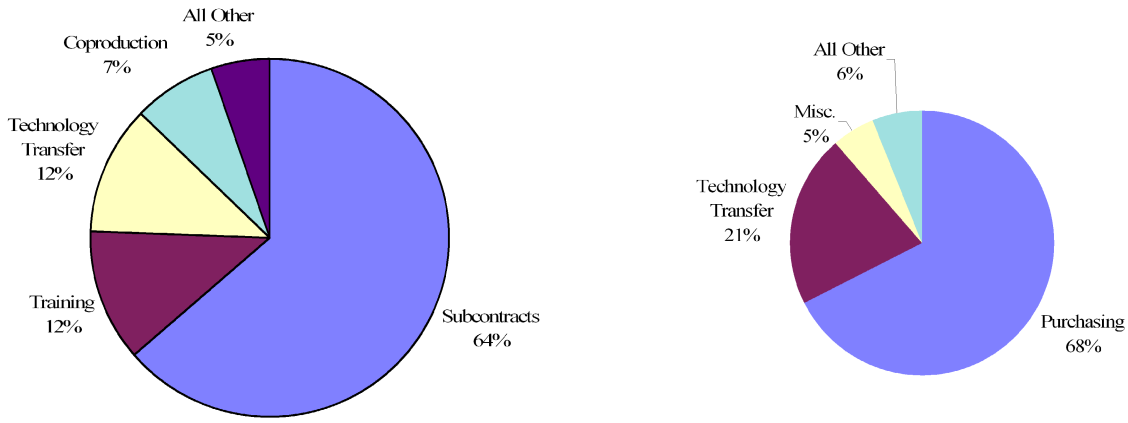
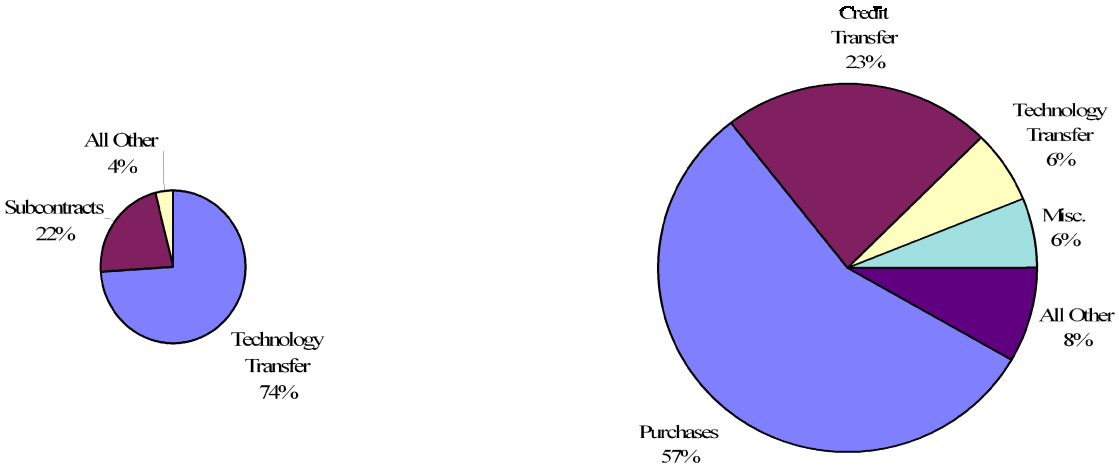


Chart 7: Non-Aerospace Offset Transactions by Type and Description

Direct ($358 million) Indirect ($3.78 billion)



Source: U.S. DOC/BXA Offsets Database

Indirect aerospace offset transactions (upper right pie) totaled $1.48 billion, slightly less than half of the directs. Sixty-eight percent ($1 billion) were purchases, the indirect counterpart to direct subcontracts. Leading countries included Britain, South Korea, Canada, and Turkey. These four accounted for almost 48 percent of the total. An unknown portion of these were defense-related. Technology transfer was the only other significant offset among indirect aerospace transactions, making up 21 percent. Over 90 percent of reported technology transfer were accounted for by just three countries: Taiwan, Finland, and South Korea.

Chart 7 shows non-aerospace transactions. The direct transactions (lower left pie) were small at only $358 million. These were predominantly technology transfer ($265 million) and subcontracts ($79 million). South Korea was the major factor in the technology transfer offsets, while Australia, Taiwan, and Germany dominated the subcontracting activity.

The indirect non-aerospace transactions (lower right pie) were more than ten times greater than the directs, and were valued at $3.78 billion. These were mostly purchases and credit transfers. The purchases ($2.13 billion) included activity in nearly 30 countries. Finland, Switzerland, Greece, Germany, and Spain accounted for more the 60 percent of the total. Finland and the United Kingdom dominated credit transfers ($872 million). Technology transfers were a distant third at $239 million. Finland, Malaysia, and the Netherlands dominated these.

3.5.3 Offset Transactions by Industry Groupings

The Standard Industrial Classification (SIC) system is used by the U.S. Government to organize the productive activities of the entire U.S. economy into 1,004 (4-digit) specific industries. Government agencies collect and publish data under this system. These industries can be aggregated into broader categories at the 3- (413) and 2-digit (83) level. This system serves as a ready statistical framework for classifying offset transactions and can be used a starting point for determining the impact of offsets on specific industries.

Table 6 below presents a profile of offset transactions by two-digit (i.e., broad-based) SIC industrial groupings. For each sector the table displays the total number and value (in $000s) of direct, indirect, and unspecified transactions. A total of 41 different industrial groups are represented. Fifteen of the groups, comprising more the 80 percent of the total

transaction dollar value, were within the manufacturing sector (i.e., from SIC 20 to 39). Almost half the transactions (48.1 percent) were in the transportation group (SIC 37).

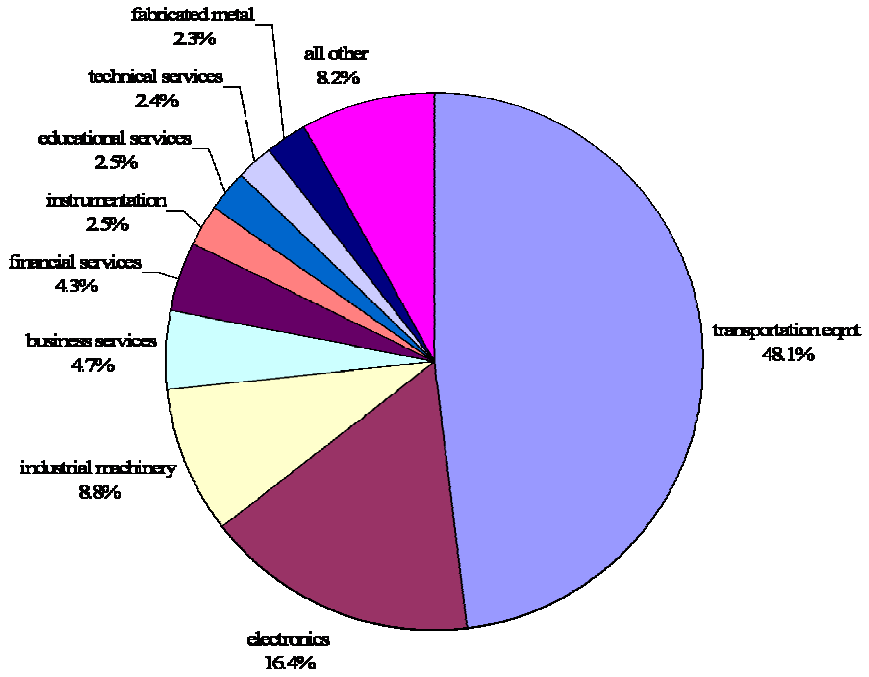
Table 7. Transactions by Major SIC Grouping 1993-1996

SIC	Group	# Transactions				Actual Value, in $000s			
		Dir	Indir	Unsp	Total	Direct	Indirect	Unsp	Total
7	Agriculture		5		5		39,228		39,228
13	Crude petroleum and natural gas		3		3		12,178		12,178
14	Mining		1		1		2,728		2,728
15	Building construction	4	4		8	10,962	10,457		21,419
16	Heavy construction		1		1		260		260
17	Construction – specialty trades		1		1		3,874		3,874
20	Food and kindred products		28		28		15,466		15,466
22	Textile mill products		2		2		6,067		6,067
23	Apparel & other finished prdcts		10		10		3,813		3,813
26	Paper mills & allied products		6		6		17,900		17,900
27	Printing & publishing	3	4		7	23,780	5,492		29,272
28	Chemicals and allied products		27		27		72,553		72,553
30	Rubber & misc. plastics prdcts		2		2		2,946		2,946
32	Cut stone and stone products		5		5		1,634		1,634
33	Primary metal industries		41		41		62,367		62,367
34	Fabricated metal products	14	52		66	27,425	185,614		213,039
35	Industrial machinery	13	270		283	94,753	714,295		809,047
36	Electronic/electrical equipment	105	279	2	386	714,212	791,608	5,344	1,511,164
37	Transportation equipment	511	503	22	1036	2,165,240	1,909,848	361,760	4,436,849
38	Measuring & analyzing instrmts	23	27		50	190,377	42,033		232,410
39	Manufacturing industries, nec		2		2		5,100		5,100
41	Power generation		1		1		11		11
42	Motor freight & warehousing		1		1		1,451		1,451
44	Water transportation		1		1		5,208		5,208
47	Transportation services		4		4		2,778		2,778
48	Communications		6		6		49,803		49,803
49	Water supply		1		1		786		786
50	Wholesale trade – durables		20		20		89,497		89,497
51	Wholesale trade – non-durables		7		7		822		822
61	Financial services	8	21		29	7,612	384,758		392,370
67	Holding/investment offices		30		30		100,737		100,737
73	Business services	9	87		96	33,067	434,569		434,569
76	Miscellaneous repair shops		3		3		3,473		3,473
79	Other services	2			2	22			22
80	Health services		1		1		28		28
81	Legal services		1		1		75		75
82	Educational services	6	18		24	132,962	96,456		229,418
87	Technical services	4	42		46	43,922	173,796		217,718
89	Misc. services	7	6		13	41,561	18,175		59,736
99	Undetermined		20		20		108,538		108,538
	Totals	**709**	**1544**	**24**	**2277**	**3,485,895**	**5,376,423**	**367,104**	**9,229,422**

Source: U.S. DOC/BXA Offset Database

As before, indirect offsets show representation in all major SIC groups listed except SIC 79 – Other Services, while direct offsets are shown in 13 major groups, and unspecified offsets appear in only two. Direct transactions are concentrated within groups 36 and 37, which cover large defense-related sectors. The value of direct transactions for these two categories is $2,879 million or 82.6 percent of the direct offset total. Indirect transactions are more widely dispersed across many industrial classifications, although $2,701 billion or 50.2 percent are concentrated within groups 36 and 37. Other notable indirect categories include (SIC 35) industrial machinery, (SIC 73) business services, which includes computer software, and (SIC 61) financial services.

Chart 8. Offset Transaction Distribution by Major SIC Grouping (Actual Value = $9.23 billion)



Source: U.S. DOC/BXA Offset Database

The concentration of offset transactions within several major SIC groups continues the trend of prior years. Chart 8 indicates 73.3 percent of all transactions are found in three industry groups. Transportation Equipment (SIC 37) is the largest by a wide margin because it includes the manufacture of complete aircraft and aircraft engines, and guided missiles. Electronics and Electrical Equipment (SIC 36) is the second largest major

group with 16.4 percent, followed by Industrial Machinery (SIC 35) at 8.8 percent. The balance of the 41 SIC categories (38 in all)

comprise the remaining 26.7 percent of the transactions. Half of the 38 industry sectors are represented by just five transactions or fewer.

Total offset transactions were further divided into 205 more detailed industrial sectors. (This involved a great deal of guess work, and will not be published.) Of the 205 sectors, 129 were four-digit; 33 were three-digit; and 43 were two-digit sectors. However, it is certain the actual number of (4-digit) industrial sectors is understated at 129 because so many of the transactions could only be identified to two- or three-digit SIC groups. Nonetheless, the bulk of offset transactions are distributed across just a few economic sectors with very thin representation in most sectors. For example, 83 industry categories had only one transaction. Another 36 sectors included only two transactions. Combined, these 119 sectors accounted for only 8.6 percent of the total value of offset transactions.

As already reported, offset transactions in aerospace related products dominate the database. Aerospace related transactions totaled $4.96 billion (53.7 percent of total) and were distributed in 33 industrial sectors. Over 78 percent of these transactions ($3.9 billion), however, were identified to SIC 372 (Aircraft and Parts) and SIC 376 (Missiles and Space Vehicles). The bulk of the SIC 372 category were *parts and components* for aircraft or aircraft engines. Other sectors with significant aerospace values included SIC 367 (Electronics - $349 million), SIC 3812 (Navigation Equipment - $118 million), and SIC 82 (Educational Services - $117 million). This information is presented on *Table 8*.

Table 8. Aerospace Offset Transactions, 1993-1996

SIC	Industry	Trans.	Actual Value	Credit Value
37	Aerospace, not specified	26	110,618,000	110,618,000
372	Aircraft and Parts	705	3,042,987,308	3,747,512,360
3721	Aircraft	10	39,529,488	39,529,488
3724	Aircraft Engines and Parts	32	114,755,000	159,472,000
3728	Aircraft Parts	201	571,043,459	613,351,855
376	Missiles and Space Vehicles	4	16,662,585	20,262,585
	Subtotal:	978	3,895,595,840	4,690,746,288
Many	Other Aerospace Parts	165	1,064,036,344	1,259,732,332
	Total Aerospace:	**1,143**	**4,959,632,184**	**5,950,478,620**

Source: U.S. DOC/BXA Offset Database

Aerospace *indirect* transactions are probably undercounted. *Direct* offset transactions could easily be cross-referenced to an exported aerospace weapon system and thereby be definitively identified as an aerospace product, since a direct offset is directly related to the exported system. This could be done regardless of any ambiguity that might have existed in the product's description. This same procedure could not be applied to *indirect offsets*, where unless the transaction's description clearly identified the product as aerospace, it would most likely be identified as non-aerospace.

The magnitude of this undercount can be roughly estimated, but with a large error margin. One method would be to take the ratio of *direct* product from the two major aerospace sectors (i.e., SIC 372, 376) to total *direct* aerospace transactions and then apply the ratio to indirect transactions. This ratio works out to about 69.2 percent (i.e., $2.16 billion divided by $3.13 billion).

Indirect transactions included $1.389 billion in the two aerospace sectors; however, this amount was almost 94 percent of the total indirect aerospace product (i.e., $1.389 divided by $1.484). If the $1.389 billion were assumed to be 69.2 percent, instead of 94 percent, of total indirect aerospace transactions, then total indirect aerospace would rise by $524 million to $2.008 billion ($1.484 + .524). Overall aerospace related transactions would then rise to $5.48 billion, or close to 60 percent of all transactions. Regardless of the size of the actual undercount, the greatest impact of offsets clearly falls on the U.S. aerospace industry.

Another concern previously alluded to with aerospace as well as other transactions is that enough detail was not available to properly classify the items. For example, SIC 372 alone (see Table 8 above) accounted for one-third of all transactions. However, SIC 372 includes three separate but more detailed 4-digit industries. This three-digit sector potentially may involve thousands of parts that go into aircraft or aircraft engines. Also, many of these parts or components may belong in other SIC sectors, such as gears, fasteners, forgings, avionics, instrumentation, landing gear, or other metal and non-metal parts. However, without more specificity the more detailed allocations could not be done.

It was difficult to assign SIC codes to transactions because in many cases the description of the transaction was not adequate. In February 1998, a letter was forwarded by the Office of Strategic Industries and Economic Security to prime contractors who submitted offsets reports during the 1993-1996 time period. The letter re-emphasized the importance of providing detailed information about the transactions in the area of offset descriptions and industry categories. It is anticipated that the reports for calendar year

1997 will be an improvement in this area so that a more thorough and accurate analysis will be possible.

4. EUROPE AND OFFSETS

4.1 Overview

As cited earlier, Europe by far demands the most offsets on U.S. military exports. European countries accounted for over two-thirds of all new offset agreements during the 1993-1996 period. Just three European countries, the United Kingdom, the Netherlands, and Switzerland, accounted for 55 percent of all new agreements. And, in the final two years of the period, all of Europe accounted for more than 85 percent of the total.

Why is Europe so dominant in offsets? Part of the answer is that European countries, among them our NATO allies, have long been the major purchasers of the newest and often most expensive weapon systems available from the United States. In addition, Europe has a large overall defense market and requirement for sophisticated weapon systems. Offsets also have a historic basis in this trade, and they seem to have a momentum of their own. Moreover, most European nations demand particularly high levels of offsets relative to the value of the imported weapon system. This is a common practice among more advanced economies. Offsets can make good political sense by redirecting what would otherwise be large international outflows back into the domestic economy. In so doing, they may also promote technology transfer, supplement defense infrastructure, or provide commercial business opportunities. Almost all European (and other) countries have adopted formalized offset policies.

To better understand the motivation behind European offset demands, it is useful to examine the political arena as well as the economics of the European defense industry. In the short run, over capacity in the European defense industry remains a dilemma. Despite reductions in defense expenditures, European public policies have maintained an unsustainable number of defense companies.

While consolidation of the defense sector proceeded quickly in the United States, it proceeded slowly in Europe. Only Britain appears to have downsized its defense industry extensively. However, Britain maintains a formal policy of 100 percent offsets, which they call “industrial participation.” The British policy appears primarily targeted at the United States, the chief source of its military imports. The policy’s implementation reflects an effort to get some of the subcontract business on purchased systems, as well as to balance bilateral defense trade with the United States.

Britain is following the same approach as the United States and many other countries with large defense establishments that view exports of defense goods as a method to maintain defense infrastructure, and take pressure off scarce public expenditures. The persistent U.S. defense surplus with Britain and other countries, and the fact that the United States has the world's singularly largest defense market, therefore, have long been points of contention.

Other European countries are driven by similar considerations, but have not followed Britain's lead in downsizing. In many cases, political considerations stalled mergers. Defense contractors remain under minimal pressure to merge or improve efficiency, either because they are state-owned or because government supporters keep business coming their way. In addition, job retention is a bigger issue in Europe than in the United States, and often receives government support or protection beyond its economic justification. National sovereignty issues and pride have also inhibited cross-border cooperation.

These basic circumstances compel the Europeans to continue the practice of offsets in negotiating major weapon agreements. It has become increasingly difficult for U.S. companies to sell to the Europeans without some form of counter compensation. European governments have pressured each other in the past several years to purchase defense equipment from European companies before considering American or other options. Even countries that do not have large industrial bases are encouraged to purchase European defense equipment for the economic good of the European Union.

In brief, the justification for offset demands by European nations can be condensed into five basic arguments:

1. the traditional national security argument;

2. maintenance of domestic defense industrial infrastructure;

3. redirection of large public disbursements for imported weapons back into domestic economy;

4. an American trade surplus in defense trade; and

5. lack of international agreements governing defense trade.

These arguments will be discussed in more detail in the sub-sections that follow. On close examination, they are not entirely persuasive. In the final analysis, offsets in defense trade are permissible under international trade rules, and therefore, they occur.

4.1.1 The National Security Argument

Do offsets promote national security? If offsets promote national security, why do nations vary so much in their offset demands and percentage requirements? Why do some nations, including several with major external threats at their borders, require few offsets? Also, why do thresholds at which offsets kick in vary from less than $1 million to over $50 million for different nations? Europe's security is linked to the NATO alliance. How can offsets, which raise the price tag of weaponry, create redundancies and inefficiencies, and distort trade, contribute to this alliance?

A pillar of national security in today's world is deterrence. Advanced weapon systems, which provide a technology edge over potential enemies, contribute to this deterrence regardless of the weapon's origin. Nations that purchase American weapon systems obviously do so for the national security benefit, not to book more offsets. Moreover, it is almost always cheaper for most nations to import these systems than to develop and produce them domestically. Co-production agreements have repeatedly demonstrated this fact.

Also, few nations can afford the cost or have the capability of maintaining a technological edge over their potential adversaries for a protracted period. This, along with other considerations, promotes collective security among friendly nations. It also promotes defense trade between allies in advanced weapon systems as a cheaper alternative to doing everything domestically. Offsets are clearly *not* needed to achieve this security, although in the eyes of the purchaser offsets may make the import more attractive.

A case can also be made that offsets marginally reduce national security by misallocating economic resources of both trading partners. This effectively lowers each nation's total purchasing power, although these effects are not easily traceable and may be diluted across many industrial sectors.

4.1.2 Maintenance of Defense Infrastructure

How important is defense infrastructure, and should every country have one? The ability to both produce and field advanced weapon systems has undeniable strategic advantages,

but it is impractical for every nation to have this capability. Geopolitical circumstances impose practical limits on the size and cost of a nation's potential defense infrastructure. The United States is especially well endowed in this respect, with abundant natural resources, a skilled workforce, technically advanced manufacturing base, and the world's largest economy. As a result, American allies have benefited from the strength of the large U.S. defense infrastructure.

Offsets were originally used to help arm allies and bolster their war-ravaged economies in the early years of the Cold War. This work was accomplished long ago. Offsets are no longer needed for this purpose. It can be argued that today *direct* offsets may contribute to the recipient nation's defense infrastructure where they are applied, but diminish that of the donor nation. However, by increasing costs to both nations, it can also be argued, perhaps even more vehemently, that offsets stretch already lean defense budgets and actually reduce defense infrastructure in both nations.

When an expensive weapon system is imported as opposed to produced domestically, unless the offsets are 100 percent co-production, what is the net gain to the defense infrastructure? The purchasing nation will remain partly dependent on the United States for whatever was not offset. Additionally, subcontractor production in the offseting nation is not only more expensive, but may have little real relationship to the core expertise of that nation and force scarce public funds away from more worthwhile projects. Moreover, once the specific production is finished, then what? In the longer run the infrastructure is dependent on domestic spending. Will this kind of business be worth sustaining?

The primary sustainer of a nation's defense infrastructure is its national defense budget. Military trade, which is financed out of national defense budgets, is currently less than 4 percent of world defense spending. Military trade could be much higher if cooperation between nations were higher. As it is, trade contributes proportionately little quantitatively to defense infrastructure, although strategically it may contribute very significantly. Offsets, which generally range between 50 and 60 percent of this trade, may make an additive but much smaller contribution to the infrastructure. Moreover, in consideration that most offsets are not *defense*-related (indirect offsets), the possible contribution sinks to an even more modest level.

In the last decade, global defense trade actually contracted almost twice as fast as global defense spending. When global defense expenditures were at their zenith in 1987 ($1.36 trillion in 1995 dollars), defense trade was estimated at only $84.4 billion, or 6.1 percent. By 1995, global defense expenditures had retrenched 36.4 percent to $864.5 billion;

however, global defense trade was down 62.2 percent to just $31.9 billion, or 3.7 percent of spending. With such small beginning and ending percentages, defense trade (i.e., imports) is apparently far less desirable than domestic defense spending.

4.1.3 Redirecting Public Disbursements to Domestic Economy

Do offsets have net benefits to the offsetting nation? Offsets force spending in the home country, which is generally the first preference of national governments. This alone may be the primary motive to engage in offsets, since the other justifications are of questionable value. The offset spending may take the form of investment, training, subcontracting, or any of the other forms offsets take. Technology transfer often has commercial spin-offs and unforeseen future payoffs, or multiplier effects.

Economic benefits to the offsetting nation can include increased employment, improved skills, educational benefits, investment in productivity enhancing equipment, and new exporting opportunities. Offsets may also strengthen or help preserve the offsetting nation's defense industrial base, if that is the intention. Additionally, if exchange rate concerns are at issue, offsets may be structured to placate these concerns.

Political considerations also play a prominent role. Offsets help avoid the stigma of spending taxpayers' money abroad. Also, offsets can be used to prop up financially troubled defense firms, or targeted industries, or even public works projects.

The answer to, "Do offsets have net benefits?" is, sometimes. Are *benefits* maximized for the price paid for them? It is necessary to know if the benefits of the offsets exceed the benefits the foreign government could have received by spending the money (i.e., cost of the offsets) elsewhere, such as reducing taxes. First, technology transfer, training, and other offsets with multipliers probably render more benefits than offsets without multipliers. The multiplier type offsets would have a net benefit if they were not already available in the offsetting nation. Second, offsets used to prop up domestic subcontractors are equivalent to subsidies. The gains in employment are negated by losses in efficiency. Also, the apparent gain in employment is actually a washout because of employment losses from reduced spending elsewhere. There probably is no net benefit; and, in fact, there may actually be losses to the economy. Third, countertrade is probably beneficial to the offsetting nation simple by financing and expediting the brokering between buyers and sellers. This will probably lead to some long-term relationships and perhaps increased future exports, a benefit. A problem arises, however, when sellers are not competitive and must either take a loss on the sale or be subsidized.

4.1.4 American Defense Trade Surplus

The American surplus in defense trade is one of the rationales European nations use to demand offsets. Several considerations make this a weak argument. First, in 1996, the EU ran a surplus in merchandise trade with the United States of $15.2 billion. (This same deficit grew to $16.7 billion in 1997.) This would have been about $2 billion more if defense trade were balanced. Also, from 1983 to 1996, the EU has run a surplus with the United States 11 of 14 years, including each year since 1993. European countries with whom U.S. firms entered into offset agreements from 1993-1996 had a combined four-year surplus of $46.2 billion. This would grow by about $8-9 billion if defense trade were balanced.

Table 9: U.S. Merchandise Trade, 1993 to 1996
European Countries with new Offset Agreements (1993-1996)

Country	U.S. Exports (in millions)					U.S. Imports (in millions)					
	1993	1994	1995	1996	4 Yr total	1993	1994	1995	1996	4 Yr total	Balance
Germany	18,932	19,229	22,394	23,495	**84,050**	28,562	31,744	36,844	38,945	**136,095**	-52,045
United Kingdom	26,438	26,900	28,857	30,963	**113,158**	21,730	25,058	26,930	28,979	**102,697**	10,461
France	13,267	13,619	14,245	14,456	**55,587**	15,279	16,699	17,209	18,646	**67,833**	-12,246
Italy	6,464	7,183	8,862	8,797	**31,306**	13,216	14,802	16,348	18,325	**62,691**	-31,385
Switzerland	6,806	5,624	6,227	8,373	**27,030**	5,973	6,373	7,594	7,793	**27,733**	-703
Belgium (plus Lux.)	9,439	11,168	12,840	12,774	**46,221**	5,402	6,642	6,288	6,980	**25,312**	20,909
Netherlands	12,839	13,582	16,558	16,663	**59,642**	5,443	6,007	6,405	6,583	**24,438**	35,204
Sweden	2,354	2,518	3,080	3,431	**11,383**	4,534	5,041	6,256	7,153	**22,984**	-11,601
Spain	4,168	4,622	5,526	5,500	**19,816**	2,992	3,555	3,880	4,280	**14,707**	5,109
Norway	1,212	1,267	1,293	1,559	**5,331**	1,958	2,353	3,087	3,993	**11,391**	-6,060
Finland	848	1,068	1,250	2,439	**5,605**	1,608	1,801	2,270	2,389	**8,068**	-2,463
Denmark	1,092	1,215	1,518	1,731	**5,556**	1,664	2,122	1,945	2,142	**7,873**	-2,317
Austria	1,326	1,372	2,017	2,010	**6,725**	1,411	1,750	1,963	2,200	**7,324**	-599
Portugal	727	1,054	898	961	**3,640**	785	899	1,057	1,017	**3,758**	-118
Greece	880	829	1,519	825	**4,053**	348	455	397	506	**1,706**	2,347
A review of 16	92	96	110	131	**429**	229	266	289	289	**1,073**	-644
Sub-total	**106,884**	**111,346**	**127,194**	**134,108**	**479,532**	**111,134**	**125,567**	**138,762**	**150,220**	**525,683**	**-46,151**
Percent of World	23.0%	21.7%	21.8%	21.5%	21.9%	19.1%	18.9%	18.7%	18.9%	18.9%	7.8%

Source: U.S. Department of Commerce, International Trade Admin., *U.S. Foreign Trade Highlights, 1996*

The largest merchandise trade deficits were with Germany, followed by Italy, France, and Sweden. The total four-year deficit with these countries was $107.3 billion. These four nations accounted for $638 million (6.3 percent of European total) of the new offset agreements and $646 million of the offset transactions (10.6 percent of European total).

The largest merchandise trade surpluses were with the Netherlands, followed by Belgium, the United Kingdom, and Spain. The total four-year surplus with these countries was $71.7 billion. These four nations accounted for $6.9 billion of new offset agreements (69 percent of the European total) and $2.1 billion of the offset transactions (34 percent of European total).

Second, sectoral trade, of which defense trade is one example, is rarely balanced, and to a degree reflects the strengths and specialization differences among nations. To balance sector trade by government mandate would nullify the gains from trade, and actually reduce potential GDPs of both trading partners. Most sectors contain a diverse range of products so that a two-way trade may occur within sectors. Also, government inputs influence trade; these include R&D, infrastructure, subsidies, tariffs and other forms of protection, and the legal environment. With that said, in 1996, the United States had surpluses in selected sectors with the EC in:

Office Equipment, including Computers:	$ 9.8 billion ($15 – 5.2 billion);
Aircraft and Parts:	$5.2 billion ($12.7 – 7.5 billion); and
Medical Instruments and Supplies:	$2.5 billion ($4.9 – 2.4).

And, Europe had surpluses in selected sectors in:

Motor Vehicles:	$10.6 billion (5.4 – 16 billion);
Steel Mill Products:	$4.2 billion (0.4 – 4.6 billion);
Pharmaceuticals:	$3.0 billion (4.5 –7.5 billion).

Source: U.S. Department of Commerce, International Trade Admin., *U.S. Foreign Trade Highlights, 1996*

Third, military trade occurs for various reasons, such as special alliances, contiguous borders, regional instability, or foreign dependence, but a primary reason is the strategic value of the weapons traded. Only a few nations produce advanced weapon systems and these nations tend to have military trade surpluses. Just about all other countries have military trade deficits. Notable surplus nations include the United States, France, the United Kingdom, and Germany.

U.S. military research and development expenditures are three times that of all European nations combined. This indicates the United States heads the list of countries likely to be counted among surplus nations. Also, of the surplus nations, only the United States is truly capable of meeting virtually all defense requirements domestically. So, in addition to heading the surplus category, the United States also heads the list of countries least dependent on imports.

As cited previously, when defense budgets fell, defense trade fell even faster. Russia registered the greatest defense trade declines, from more than half the world's total to only a small fraction today. At the same time, the combined defense exports of the United States and Europe also declined somewhat in value, but grew from less than half the world total to over 80 percent currently. Imports into these two regions also declined, lessening the impact on the levels of defense trade surpluses.

Almost 80 percent of the U.S. military trade surplus with the world comes from countries outside of Europe. Over the years, the U.S. surplus with the rest of the world (excluding Europe) averages about three times the value of Europe's surplus with the world (excluding the United States). This indicates the United States has a competitive edge over Europe in third-country competitions.

Fourth, direct and defense-related indirect offsets themselves cancel out much of the U.S. defense surplus with Europe, particularly with countries such as the United Kingdom and the Netherlands, which demand 100 percent offsets on big ticket items. For example, from 1993-1995, the defense trade surplus with Europe was $7.1 billion. (Three years are used instead of four because the final trade figures for 1996 are not available.) New offset agreements during the same period totaled $8.3 billion, and offset transactions were $4.3 billion. About one-third of the offset transactions were direct; however, about two-thirds were aerospace products, a large percentage of which were probably defense-related.

Table 9 below presents European and U.S. military trade from 1987 to 1996. The United States and Western European nations export roughly the same amount of military items and have overall trade surpluses' with the rest of the world. About 30 percent of Europe's exports (and imports) are intra-European. However, this would not change Europe's *external* defense surplus since both exports and imports would be debited the same amount. The United States had a surplus with Europe each year, although the trend in both the magnitude of the trade and the surplus is downward. U.S. imports from the world are not shown on the table, but estimates were made by the U.S. Arms Control and

Disarmament Agency to be roughly twice the value shown as the United States imported from Europe.

Table 10: Arms Trade Between United States and Western Europe, 1987-1995
(in constant 1995$ - millions)

Year	U.S Exports to World	U.S. Exports to Europe	U.S. Imports fm Europe	US Trade Surplus		European Trade with World		
				Europe	World	Exports	Imports	Surplus
1987	22,650	5,000	1,424	3,576	19,802	21,188	15,142	6,046
1988	17,480	5,000	1,748	3,252	13,984	20,515	15,946	4,569
1989	19,050	7,000	1,019	5,982	17,012	21,042	15,519	5,523
1990	16,320	5,000	1,035	3,966	14,250	21,414	13,613	7,801
1991	15,910	4,000	1,050	2,950	13,810	15,032	13,007	2,025
1992	14,200	2,800	861	1,940	12,478	14,332	10,600	3,732
1993	15,940	2,900	734	2,166	14,472	11,554	9,753	1,801
1994	13,800	2,900	564	2,336	12,672	11,778	9,311	2,467
1995	15,600	3,100	500	2,600	14,600	14,091	8,635	5,456
1996	17,000	-	-	-	-	16,391	8,500	7,891

Source: International Institute for Strategic Studies, London, *The Military Balance, 1997/98*

The Netherlands and the United Kingdom purchased major U.S. weapons systems over the last five years even when European options were available. France has purchased major U.S. defense weapons systems only when no French or European option was available. The French defense procurement policy has been to buy equipment from French sources first, then to pursue European cooperative solutions, and lastly to import a non-European item. This reflects a desire to retain a defense industrial base and maintain autonomy in national security matters.

Germany and Italy have made limited purchases of U.S. defense equipment in recent years because of significantly reduced defense procurement budgets and commitments to European cooperative projects. Both countries have now adopted an open defense procurement policy and competitively buy a mixture of American and European products, albeit with offset demands.

Of the major European defense system exporters, the British global market share has increased since the 1991 Gulf War due primarily to arms purchases by several Gulf States. Arms deliveries by France and Germany have decreased from past levels.

Undercount of Defense Trade Numbers

It should be noted that worldwide defense trade numbers are understated due to an undercount of traded military components and services and other items. These include metal parts and components, electronic components, instrumentation, chemicals, technical data, repair services, and a host of other items that are typically counted as commercial products in the official trade statistics, but used for military purposes. It is difficult to even estimate these. The U.S. State Department issues export licenses for items on the Munitions List for about $25 billion a year. However, these licenses are valid for four years, and not all that is licensed is exported. A similar undercount undoubtedly applies to U.S. military imports. The undercount problem almost certainly applies to the statistical collections of other countries.

With these caveats, the latest available military trade statistics (1996) are published in *The Military Balance, 1997/1998*, an annual compilation by the International Institute for Strategic Studies (IISS) in London. The IISS data is gathered from all over the world; one source is the Arms Control and Disarmament Agency (ACDA). ACDA, which publishes world defense trade numbers also, is making an effort to improve accountability of the Munitions List licenses, which the Agency reports could increase the U.S. military export numbers significantly. At the time of this writing, however, a reliable method for tabulating or estimating these numbers had not been adopted. The U.S. export numbers reported in *The Military Balance* are primarily Foreign Military Sales deliveries reported by the U.S. Defense Security Assistance Agency. This is a separate publication, which is also reported by ACDA .

4.1.5 Defense Trade Exemption from International Controls

Under the World Trade Organization (WTO), defense trade, including offsets, is one of the last bastions of legitimate government market intervention. The practice of offsets in defense trade is currently exempt under Article XXIII of the WTO from rules governing commercial trade. However, it is recognized that offsets result in trade distortions and inefficiencies under the economic principles on which WTO policies are based. Under Article XVI the WTO prohibits the practice of offsets in government procurement of commercial items. Thus, if governments choose to exercise the military exemption, in principle they are also willing to live with any trade distortions and added costs associated with that option.

4.2 Contrasts in the U.S. and European Defense Industrial Bases

European defense expenditures are about two-thirds those of the United States. However, Europe has two to three times more suppliers. For example, the United States has three major suppliers in the military aircraft sector, while six European nations each have at least one major supplier.

In terms of defense revenue, U.S. companies tend to outpace their European counterparts. In 1997, the United States had seven of the world's top 10 defense firms (up from six in 1996), while Europe had the remaining three. The top 10 are shown in Table 12 with defense and total revenues. The seven U.S. firms represent about three-fourths of both the defense and total revenues of the 10 firms shown.

Table 11: Top Ten World Defense Companies
(in $millions)

Top Ten World Defense Companies	1997 Defense Revenue	1997 Total Revenue
1. Lockheed Martin Corporation (US)	18,500.0	28,000.0
2. Boeing Company (US)	13,775.0	45,800.0
3. British Aerospace plc (UK)	10,091.0	13,673.0
4. Northrop Grumman Corporation (US)	8,200.0	9,200.0
5. Raytheon Co. (US)	6,270.0	13,700.0
6. General Electric Company (GEC) plc (UK)	5,773.6	18,388.1
7. Thompson Group (France)	4,184.1	6,422.9
8. TRW Inc. (US)	3,800.0	10,800.0
9. General Dynamics Corp. (US)	3,650.0	4,062.0
10.United Technologies Corp. (US)	3,311.0	24,713.0
Total	**77,554.7**	**174,759.0**

Source: *Defense News*, July 21-27, 1998

4.2.1 Defense Budgets

European countries' defense budgets in 1996 totaled $173 billion; this was about 65 percent of the U.S. total of $266 billion. France led European nations in defense spending at $47 billion. Germany was second at $39.2 billion and the United Kingdom third at $33.5 billion and. Italy was fourth at $23.8 billion. These four countries represented about 71 percent of the European total in 1996.

Table 12: Comparative GDPs and Defense Expenditures, 1996

	United States	Western Europe	Top 4 W. Eur.	France	Germany	United Kingdom	Italy
GDP	7,600	8,650	6,000	1,500	2,200	1,200	1,100
Defense Expenditures	266.0	173.3	143.2	47.2	39.2	33.5	23.8
Military Exports	17.0	16.4	15.3	5.6	0.7	8.8	0.2
% Def. of GDP	3.5%	2.0	2.3%	3.1%	1.8%	2.8%	2.2%
% of GDP in 1987	6.1%			3.9%	3.1%	4.6%	3.6%

Source: International Institute for Strategic Studies

Total 1996 procurement expenditures in Europe were $39.6 billion and research and development spending was $12.3 billion. This compares with U.S. procurement of $42.4 billion and $35 billion in R&D spending. The European total of $52 billion was about 30 percent of total European defense spending. The U.S. combined total of procurement and R&D was slightly less, at about 29 percent of the total U.S. defense budget. The most significant difference between Europe and the United States is relative expenditures on R&D.

Chart 9: Defense Procurement: U.S. vs. Europe

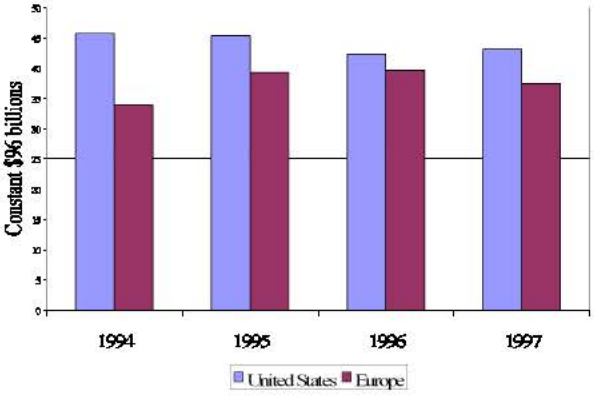
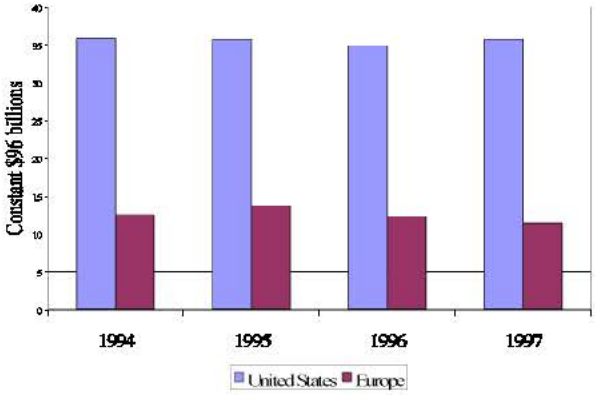


Chart 10: Defense R&D: US vs. Europe



Source: International Institute for Strategic Studies

Overall, European nations have decreased their defense research and development spending over the last three years, at about one-third of the relatively stable U.S. research and development funding.

Spending cuts by European member-states, especially those announced by France and Germany, are evidence that their current priority is to meet the single currency (the Euro – see section 4.3) economic targets criteria at the expense of defense programs.

The United States is able to source virtually all its military needs from domestic industry, with defense imports typically accounting for 2 or 3 percent of defense expenditures. Most U.S. defense imports are subsystems and components rather than entire weapon systems, and are supplied largely by the United Kingdom. As stated previously, the United Kingdom is consistently the largest buyer of U.S. equipment in Europe. France and Sweden have attempted to pursue a policy of almost exclusive procurement from indigenous sources, but are often dependent on foreign subcontractors for certain components.

Europe's defense industry is badly splintered among small national markets, with far too much duplication of a limited research and development effort. Because of this, the European defense producers are faced with trying to market less up-to-date weaponry at higher prices than are available from their U.S. counterparts.

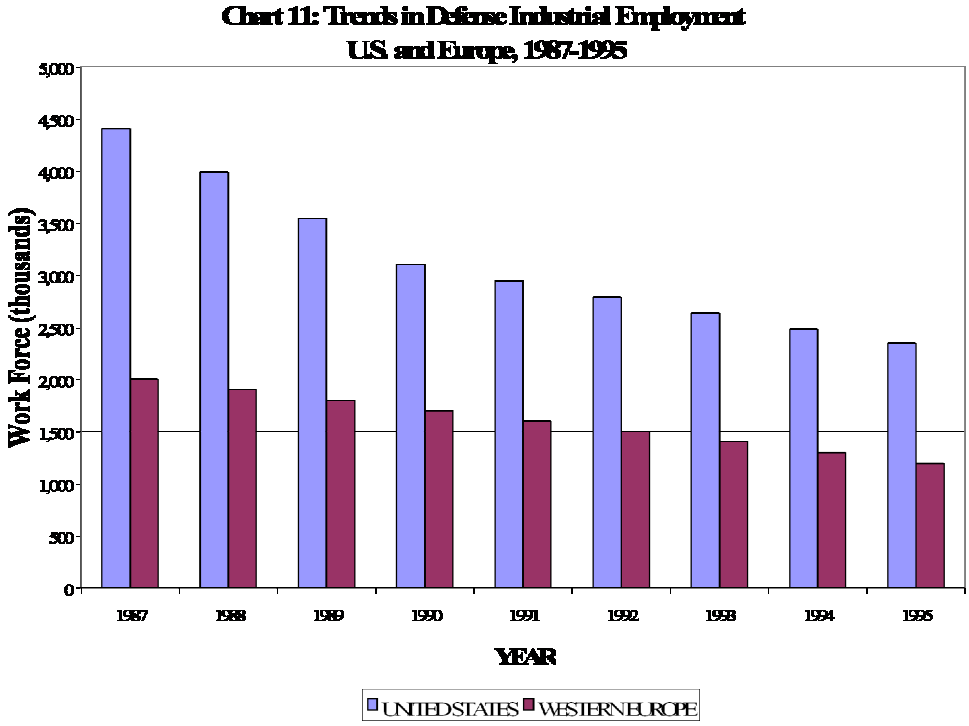
Escalating weapon systems costs also continue to be a dominant feature of NATO alliance equipment programs. In 1996, NATO Europe member states spent just over $158 billion on defense, slightly down from 1995 levels, and accounted for around 40 percent of NATO's spending overall. The U.S. share is some 58 percent. NATO Europe defense spending fell about 9 percent in real terms in 1997, to about $145 billion. Budgetary constraints limit the ability of European defense companies to exploit new technologies, which could enhance capabilities. This will undoubtedly have adverse effects on their competitiveness in the long term.

While the United States has two major aircraft procurement programs underway, Europe has three: the Eurofighter, the Saab made Gripen, and the Dassault Rafael. Europe also has four tank programs, compared with one U.S. program, and eleven missile makers, while the United States has only four. These and other defense programs in Europe share total defense spending of about $130 billion.

The entire cost of the French Rafael will be undertaken by Dassault, but it is highly likely that it will end up a collaborative effort with Aerospatiale and perhaps other aerospace companies outside of France. The JAS 39 Gripen, undertaken by Saab of Sweden, is actually a joint venture with British Aerospace (BA). BA manufactures the wing assemblies and other items. Gripen fighters manufactured for export will be produced with a 50/50 share of revenue and profit with BA. The Gripen uses a derivative of a General Electric designed engine, the F404.

4.2.2 Defense Industry Employment

Defense employment in the United States and Western Europe has dropped significantly along with the declines in national defense budgets. During the nine year period from 1987 to 1995, the U.S. workforce fell 47 percent, from 4.4 to 2.35 million, displacing more than 2 million workers. Europe also experienced a workforce decline, although to a lesser degree. In the same time span, the European workforce fell from 2 to 1.2 million, a drop of 40 percent. The percentage of labor reductions for the top three European nations was uneven. The United Kingdom's defense industrial workforce fell 44 percent, while Germany's workforce fell by 30 percent, and France experienced a 29 percent decline.



Source: International Institute for Strategic Studies

A paper titled *The Effects of Offsets, Outsourcing and Foreign Competition on Output and Employment in the U.S. Aerospace Industry*, was submitted by Robert E. Scott of the Economic Policy Institute to the National Research Council's Symposium on *Trends and Challenges in Aerospace Offsets* in January, 1998. The paper presented employment trends and analysis in the North American, European and Japanese aerospace industries. Dr. Scott showed that the United States experienced a much larger percentage and numerical drop in aerospace employment between 1989 and 1995 than did the rest of

world. The data combined military and civilian aerospace jobs. U.S. employment fell from 992,000 to 580,000, while that of the EU fell from 485,740 to 348,061. In percentage terms the U.S. drop was 41.5 percent, compared with 28.3 percent for the EU. The United Kingdom fell from 189,911 to 110,549, a 58 percent decline. In actual numbers, the U.S. fell 412,000 in contrast to the EU, which loss fewer than 138,000 jobs, only one third the American total. At least 333,000 (81 percent) of the U.S. decline was military- related employment.

Dr. Scott attributed the U.S. decline to a drop in sales (about 65 percent), productivity increases (about 25 percent), and increased imports (about 10 percent).

Table 13: Aerospace Employment Trends in Selected Locations, 1989 and 1995
(in thousands of employees)

Year	UK	Other EU	Total EU	Canada	Japan	US	Total
1989	189.9	295.8	485.7	66.1	38.3	992.0	1,582.1
1995	110.5	237.5	348.1	57.3	38.3	580.0	1,023.7
Decline	79.4	58.3	137.6	8.8	0	412.0	558.4
% Decline	-58.2%	-19.7%	-28.3%	-13.3%	0.0%	-41.5%	-35.3%
% of Total Decline	14.2%	10.4%	24.6%	1.8%	0.0%	73.8%	-

Source: *The Effects of Offsets, Outsourcing and Foreign Competition on Output and Employment in the U.S. Aerospace Industry*, Robert Scott, Economic Policy Institute, January 1998.

4.3 The Maastricht Treaty

The incentive to restructure in Europe goes beyond the military. The entry into force of the Maastricht Treaty on November 1, 1993, marked the beginning of a new stage in which the European Union (EU) is carrying forward its economic and monetary integration as well as the establishment of a common foreign and security policy. The most contentious aspect of the Treaty was its call for the implementation of a single European currency, the Euro, by January 1, 1999.

All EU members were faced with strict adherence to the Maastricht Treaty's convergence criteria of keeping: 1) national budget deficits below 3 percent (of GDP); 2) a government debt of no more than 60 percent of GDP; and, 3) an inflation rate within 1.5 percentage points of the three EU members with the lowest inflation. To meet this goal, Germany, for instance, instituted an austerity plan to reduce its national budget deficit. This resulted in a sharp rise in German unemployment by the beginning of 1997, after sluggish growth (1.4 percent) in 1996. With higher unemployment and pressure from

labor unions, public spending in Germany increased, placing the 3 percent goal in jeopardy. However, growth increased to 2.2 percent for the year in 1997 and the goal was reached.

The Europeans hope to phase in monetary union over a three-year period beginning in 1999. With average EU economic growth for 1996 at only 1.7 percent, reducing unemployment proved extremely difficult. While structural problems lay at the heart of the high unemployment, efforts to achieve the Maastricht criteria prevented public spending from stimulating demand.

The problem of meeting the Treaty terms was eased somewhat in 1997, when EU-wide growth increased to 2.6 percent. In early May 1998, 11 EU members, meeting the criteria, signed on to the European Monetary Union. Only Greece failed to meet the requirement, but may apply again at a later date. Three other nations, Denmark, Sweden, and Britain, opted out of the monetary union for the time being.

The terms of the Maastricht Treaty have also caused governments to redirect resources out of the defense sector. This adds pressure on these governments to depend more on policies such as offsets in international military trade. The problems may also jeopardize ongoing cooperative military programs and/or discourage new ones. For example, the number of Eurofighters on order has fallen, and this circumstance could eventually cause the program to fail.

5. TRADE POLICIES AND OFFSETS

5.1 U.S. Foreign Military Financing Program

Current U.S. policy permits foreign governments to condition offsets on U.S. military export sales that are partly or wholly financed through the Foreign Military Financing Program (FMF). The FMF features lenient repayment terms to begin with, and Congress usually waives the loan, so it becomes a direct grant. During the four-year period FY 1993 to FY 1996, $15.6 billion was funneled through this program. The U.S. program is unique in that no other arms supplier provides a combination of grant aid and offsets. The policy should be changed to limit or eliminate the receipt of offsets as a condition of receiving FMF funding in cases where the foreign government requires offsets.

The primary recipients of this aid have been Turkey, Greece, Egypt, and Israel. Since 1987, Israel and Egypt have received FMF direct grants (repayment waived) valued at $1.8 and $1.3 billion each year. Additionally, since 1991, Israel was authorized to spend $475 million of the $1.8 billion for procurement within Israel. Prior to 1993, Turkey and Greece received both FMF grants and loans. From FY 1993 to FY 1996 Turkey received about $1.5 billion in direct loans from DoD on liberal terms. Greece received over $1 billion in direct DoD loans.

All four nations have obtained offsets for FMF sales of U.S. weapons. A 1994 General Accounting Office study reported these countries demanded $4.7 billion in offsets in preceding years. The study found that these FMF recipients developed their own industrial bases and other aspects of their economies through these offset requirements at U.S. taxpayer expense. Stronger prohibitions on offsets in these sales might reduce these subsidies to foreign governments in association with military exports.

5.2 World Trade Organization (WTO) Agreement

The WTO was set up in 1995. The international organization that preceded it was the General Agreement on Tariffs and Trade (GATT), although the GATT agreement is now part of the WTO agreements. At the end of 1997, there were 132 signatories to the WTO agreement and 31 observer governments. All 31 observer governments have applied to become members.

The WTO is the primary international body dealing with the rules of trade between nations. The central mission of the WTO is to reduce protectionism. The agreements contained within the WTO are intended to set the ground-rules for international trade so that it will flow as freely as possible. Some of the fundamental principles include non-discrimination (*a.k.a.* most-favored-nation treatment) and encouragement of competition. The economic case for an open trading system is based upon the long-held theory that protectionism leads to inefficient resource allocation.

5.2.1 WTO Agreement on Government Procurement

An important means by which policy makers can address defense trade offsets are continued efforts to strengthen the WTO Agreement on Government Procurement (GPA). The GPA was negotiated during the Uruguay Round of multilateral trade negotiations, and is one of the plurilateral agreements under the Agreement establishing the WTO. The principle underlying the GPA is that signatories must treat the goods, services and suppliers of other signatory countries no less favorably than they treat their own domestic products, services and suppliers.

The GPA entered into force on January 1, 1996. There are currently 26 signatories: Aruba, Canada, the member states of the European Union (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Spain, Portugal, Sweden, and the United Kingdom), Hong Kong, Israel, Japan, Republic of Korea, Liechtenstein, Norway, Singapore, Switzerland, and the United States.

Article XVI of the GPA prohibits government entities from imposing, seeking and considering offsets in the qualification and selection of suppliers or in the evaluation of tenders and award of contracts. Offsets are defined as measures used to encourage local development or improve the balance-of-payments accounts by means of domestic content, licensing of technology, investment requirements, counter-trade or similar requirements. Defense procurements subject to the GPA are country specific and identified by either a positive or a negative list in the individual country Annex.

Major defense agencies are generally covered under the GPA. However, Article XXIII provides a broad exception for government purchases related to national security. Therefore, the prohibitions against the use of offsets would not apply to such contracts.

5.3 Agreement on Trade in Civil Aircraft

The plurilateral GATT Agreement on Trade in Civil Aircraft was negotiated during the Tokyo Round of Multilateral trade negotiations, and entered into force on January 1, 1980. The agreement applies to civil aircraft, engines, flight simulators and components. Canada, the European Union, Egypt, Japan, Norway, Romania, Switzerland, Macao, Bulgaria and the United States are signatories of the Agreement on Trade in Civil Aircraft.

The Agreement provides that airlines and other purchasers should be free to select suppliers on the basis of commercial and technological factors. The agreement eliminates import duties on civil aircraft; prohibits certain non-tariff barriers such as stipulating that national carriers purchase from national suppliers or employing standards to discriminate against imported products.

5.4 U.S. -EU Agreement on Trade in Large Civil Aircraft

In 1992, the United States and the European Union signed an "Agreement Between the Government of the United States of America and the European Economic Community Concerning the Application of the GATT Agreement on Trade in Civil Aircraft on Trade in Large Civil Aircraft", known less formally as the U.S.-EU Agreement on Trade in Large Civil Aircraft. This bilateral agreement expands and clarifies the provisions of the plurilateral GATT Agreement on Trade in Civil Aircraft to trade in large civil aircraft. Only the United States and the European Union are bound by the obligations of the U.S.-EU Agreement on Trade in Large Civil Aircraft.

Article 4 of the GATT Agreement on Trade in Civil Aircraft deals with government-directed procurement, mandatory sub-contracts and government inducements which could influence aircraft sales competitions. Article 4.1 provides that "purchasers of civil aircraft should be free to select suppliers on the basis of commercial and technological factors". However, Article 4.3 also provides as follows:

> *Signatories agree that the purchase of products covered by this Agreement should be made only on a competitive price, quality and delivery basis. In conjunction with the approval or awarding of procurement contracts for products covered by this Agreement a Signatory may, however, require that its qualified firms be provided with access to*

> *business opportunities on a competitive basis and on terms no less favourable than those available to the qualified firms of other Signatories.*

The second sentence of Part 4.3 has been subject to interpretation that it permits signatories to impose, as a condition of purchase, mandatory offset requirements. Annex I of the U.S.-EU Agreement of Trade in Large Civil Aircraft interprets the provisions of Article 4.3 of the GATT Agreement on Trade in Civil Aircraft to prohibit clearly the imposition of government-mandated offsets:

> *By emphasizing that the only factors which should be involved in purchase decisions are price, quality and delivery terms, the signatories agree that Article 4.3 (of the GATT Agreement on Trade in Civil Aircraft) does not permit Government-mandated offsets. Further, they will not require that other factors, such as subcontracting, be made a condition or consideration of sale. Specifically, a signatory may not require that a vendor must provide offset, specific types or volumes of business opportunities or other types of industrial compensation.*
>
> *Signatories shall not therefore impose conditions requiring subcontractors or suppliers to be of a particular national origin.*

During the U.S.-EU negotiations on the Agreement on Trade in Large Civil Aircraft, the United States and the European Union agreed to propose to the signatories of the GATT Agreement on Trade in Civil Aircraft that the provisions of the former agreement be incorporated into the latter. This was to include measures in Annex I related to offsets. For reasons not related to trade disciplines on offsets, incorporation of the principles of the U.S.-EU Agreement on Trade in Large Civil Aircraft into the GATT Agreement on Trade in Civil Aircraft has not occurred.

Agreement by the European Union and the United States to prohibit government-mandated offsets in connection with the sale of large civil aircraft is an important precedent. This precedent does not affect trade in military aircraft. However, the 1992 U.S.-EU Agreement on Trade in Large Civil Aircraft has served to provide a sound basis for addressing the exclusion of offsets from military aircraft trade as well.

6. FINDINGS

- In the four years (1993-1996) new offset agreements totaled $15.1 billion and supported $29.1 billion in export contracts. The offset agreements represented about 52 percent of the export contract values; for the last two years, the average offset was about 80 percent.

- Offset transactions were valued at $9.2 billion and offset credits $10.7 billion over the same time period. About 38 percent of the transactions were direct offsets, 58 percent indirect, and 4 percent unspecified. About 73 percent of the actual value of transactions were subcontracting activity, purchases, or technology transfer.

- Over 90 percent of the new offset agreements and offset transactions referenced exports of U.S. aerospace weapon systems. However, almost half the actual offset transactions were fulfilled with non-aerospace products. More than 90 percent of *direct* offsets were aerospace products, and more than 70 percent of *indirect* offsets were fulfilled with non-aerospace products.

- Nearly 83 percent of the offset transactions were manufactured products. Three-fourths of the offset transactions fell into three major industry groupings:

    1. SIC 37 - Transportation Equipment (48 percent);

       sub-group SIC 372 - Aircraft and Parts alone accounted for 33 percent

    2. SIC 36 - Electronic and Electrical Equipment (16 percent); and
    3. SIC 35 - Industrial Machinery (9 percent).

- Thirty-two U.S. defense prime contractors reported entering into new offset agreements during the 1993-1996 period. Five of these companies accounted for over 78 percent of the value of new offset agreements and nearly 82 percent of export contract values. Five countries - the United Kingdom, the Netherlands, Switzerland, Saudi Arabia, and Taiwan - accounted for 72 percent of the value new offset agreements.

- From 1993 to 1996, an estimated 30-40 percent of the total value of military export contracts were negotiated with offset agreements. Most military export contracts are below country thresholds for applying offsets, which average about $7.6 million, as well as the statutory minimum data reporting requirement. However, virtually all large aerospace export contracts included offsets.

- The motivation behind offset demands is primarily the desire to redirect public funds back into the foreign purchaser's economy. National security considerations play a diminished role in the offset decision making process in the post-Cold War period.

- Offsets have the effect of increasing the cost of the exported weapon system, which ultimately must be passed on to the foreign purchaser. These increased costs are incurred when shifting parts production to newly established overseas suppliers, and/or fees for transferring technology, or various other administrative expenses. Co-production is the most costly form of offset, as it typically involves the replication of an entire production or assembly facility to produce a limited number of military items.

- The U.S. primes have become more competitive because of consolidation and downsizing. As stronger competitors, U.S. firms have increased their share of a smaller international defense market.

- As a measure to reduce the inefficiencies inherent in offsets, the development of expensive weapon systems could be effectively accomplished through international partnering with allies. This would spread costs and benefits and reduce duplication. It would also provide added incentives to market the weapon systems more widely. The Joint Strike Fighter program, with British, Dutch, and Canadian participation, is an excellent example of this type of cooperation.

- The prohibitions on offsets in the WTO GPA and the U.S.-EU Agreement on Trade in Large Civil Aircraft are helpful models if consideration is given to addressing defense trade offsets in the WTO.

- Europe's ability to produce state-of-the-art weaponry at a reasonable cost is ultimately contingent upon transnational cooperation and greater integration of the European defense industry. Meeting the economic targets of the Maastricht Treaty has caused European governments to redirect resources out of the defense sector. This adds pressure on these governments to depend more on policies such as offsets to stimulate domestic economies. The continued use of offsets is inhibiting European cooperation and integration.

- The United States spends three times more on military R&D than European nations, contributing to the U.S. lead in sophisticated weapon systems and competitiveness.

- From 1987 to 1995, the U.S. defense workforce fell 47 percent from 4.4 to 2.4 million workers, while the European workforce fell 40 percent from 2 to 1.2 million. This indicates that the U.S. has adapted more quickly to the declining world defense market. Overcapacity in the European defense industry continues to plague the Europeans and pressures them to continue the practice of demanding offsets.

- The U.S. has a positive but declining defense trade balance with Europe, which has been cited by the European governments as a rationale for high levels of offsets. However, the U.S. has a negative balance in merchandise trade with Europe, which includes both commercial and military trade. The defense surplus has ranged from $2-3 billion since 1993, while the merchandise deficit was $15.2 billion in 1996 alone. (This same deficit grew to $16.7 billion in 1997.) When offsets are included in the calculation, the U.S. defense trade surplus is effectively cut in half.

7. RECOMMENDATIONS

Recommendations from 1996 and 1997 Reports

The 1996 BXA report, *Offsets in Defense Trade*, listed three recommendations for implementation by the interagency community:

1. *Implement consultations with major U.S. arms producers, both primes and subcontractors, and with labor to gather representative views on minimizing the adverse effects of offsets in defense trade.*

2. *Consult with our trading partners on offsets in defense trade and related military procurement issues.*

3. *Review and modify as necessary current U.S. Government policy on offsets in defense trade to respond to the changing nature of offset demands, reflecting both the need for U.S. firms to remain competitive in international arms markets and the need to maintain our defense industrial base. The United States should be cautious in making any decision to unilaterally limit offsets.*

A similar list of recommendations was detailed in the Interagency Trade Promotion Coordinating Committee's annual *National Export Strategy* report to the President for 1996.

The 1997 BXA report on Offset in Defense Trade defined a strategy for achieving a domestic consensus on offsets policy, including consultations with U.S prime contractors, defense subcontractors and other interested parties, including unions, congressional staffs, and trade associations. The strategy included the following:

Effort to Build Domestic Consensus*: On June 9, 1997, the Bureau of Export Administration co-sponsored a workshop entitled Policy Issues in Aerospace Offsets. The workshop was hosted by the National Research Council§s Board on Science, Technology, and Economic Policy. This workshop served as a forum for exchanging views, which will help build a consensus as to what would constitute an appropriate U.S. policy on offsets. The participants focused on many important issues such as pressures faced by industry in international competition for business, trends in countries' demands for offsets, and the long-term consequences to U.S. competitors of offsets as industrial policy tools. Once a domestic consensus is achieved, a multilateral offset policy is more likely to ensue that will reflect a common set of mutually beneficial interests.*

Consultations with U.S. Primes and their Representatives*: Based on the information gathered at the meetings and consultations, we will determine the best strategy for international discussions. Bureau of Export Administration officials have had and will continue talks with the Aerospace Industry Association and other groups, including U.S. prime contractors, to understand their concerns as major offset stake-holders, and to gain their participation in formulating a policy.*

Consultations with Government Agencies, Subcontractors and Other Concerned Parties*: We have scheduled a series of meetings through the fall at Commerce with interested groups to learn from them what their concerns are, to broaden their understanding of the complexity of the issue, and to begin to build support in the U.S. for an international initiative. Those with whom we will meet would include the agencies of the U.S. government, affected subcontractors or suppliers, unions, congressional staff members, and representative associations.*

Develop Strategy for Multilateral Consultations*: We will plan a meeting of Washington-based defense attachés to discuss the results of our meetings with interested parties. We also plan to pursue, as appropriate, bilateral and multilateral consultations on offsets in defense trade.*

Actions since August 1997 Report to Congress

As part of the process to build a domestic consensus for an U.S.-led initiative on offsets in defense trade, BXA hosted a meeting with the primary U.S. Government agencies concerned with the issue. Held on October 20, 1997, at the Commerce Department, this policy-level meeting was designed to coordinate implementation of the recommendations detailed in the 1997 Offsets in Defense Trade report. All agencies that participated agreed to assist BXA in the implementation process. In attendance were individuals from the following agencies:

-U.S. Department of Commerce, Office of Aerospace and Office of Strategic Industries and Economic Security;
-U.S. Department of Defense, Office of Cooperative Programs;
-U.S. Department of Labor, Office of International Affairs;
-U.S. Department of State, Office of Trade Policy and Programs;
-U.S. Department of Treasury, Office of Policy Coordination, and;
-Office of the U.S. Trade Representative.

With the support of the interagency community, BXA organized and hosted a series of meetings with "interested parties" as a precursor to formal discussions with our allies:

- October 22, 1997 - BXA Under Secretary Reinsch briefed 21 foreign defense attaches assigned to embassies in the U.S. on the findings and recommendations detailed in BXA's August 1997 Offsets in Defense Trade report to Congress.

- January 13, 1998 - BXA hosted an Industry-Government Forum on Offsets with a focus on U.S. defense prime contractors. In attendance were representatives from the leading U.S. defense exporters. A full discussion ensued on the pros and cons of offsets in defense trade. Industry representatives provided the interagency team with their views on developing strategies for international consultations with our allies.

- January 14, 1998 - BXA co-sponsored a two-day "Symposium on Trends and Challenges on Aerospace Offsets", hosted by the National Research Council. The symposium brought together leading experts from industry, government and academia to discuss the effect of offsets on the aerospace sector.

- February 5, 1998 - BXA and the Department of Labor co-hosted a forum on offsets with the focus on U.S. labor and related organizations. The meeting was an open discussion of the implications of increasing offset demands on employment in the defense and commercial sectors. As with the meeting with U.S. prime contractors, labor

representatives provided their views on developing a strategy for international consultations with our allies on offsets.

- April 1, 1998 - BXA hosted a one-day session, "The Effect of Offsets on the U.S. Subcontractor Base," in Austin, Texas. The event was cosponsored by the National Defense Industrial Association and the State of Texas, Department of Economic Development. The objective of the meeting was to gather the offset experiences and viewpoints of the small- and medium-sized businesses and associations that make up the second and third tiers of the U.S. defense industrial base. Representatives from the Ministry of Defense of the United Kingdom and the Embassy of Australia participated in the event to provide foreign government perspectives on the issue.

Based on the positive results from the sessions held with various players in the offsets community, BXA and the interagency team are focusing efforts on identifying the most appropriate forum to initiate consultations with our allies on offsets.

Appendix A

THE DEFENSE PRODUCTION ACT OF 1950, AS AMENDED
(50 U.S.C. App. 2061, et seq.)

Section 309.

(a) Annual Report on Impact of Offsets--

(1) Report Required -- Not later than 18 months after the date of the enactment of the Defense Production Act Amendments of 1984, and annually thereafter, the President shall submit to the Committee on Banking, Finance and Urban Affairs of the House of Representatives and the Committee on Banking, Housing, and Urban Affairs of the Senate, a detailed report on the impact of offsets on the defense preparedness, industrial competitiveness, employment, and trade of the United States.

(2) Duties of the Secretary of Commerce (hereafter in this subsection referred to as 'the Secretary') shall--

(A) prepare the report required by paragraph (1);

(B) consult with the Secretary of Defense, the Secretary of the Treasury, the Secretary of State, and the United States Trade Representative in connection with the preparation of such report; and

(C) function as the President's Executive Agent for carrying out this section.

(b) Interagency Studies and Related Data--

(1) Purpose of Report-- Each report required under subsection (a) shall identify the cumulative effects of offset agreements on--

(A) the full range of domestic defense productive capability (with special attention paid to the firms serving as lower-tier subcontractors or suppliers); and

(B) the domestic defense technology base as a consequence of the technology transfers associated with such offset agreements.

(2) Use of Data--Data developed or compiled by any agency while conducting any interagency study or other independent study or analysis shall be made available to the Secretary to facilitate the execution of the Secretary's responsibilities with respect to trade offset and countertrade policy development.

(c) Notice of Offset Agreements--

(1) In General--If a United States firm enters into a contract for the sale of a weapon system or defense-related item to a foreign country or foreign firm and such contract is subject to an offset agreement exceeding $5,000,000 in value, such firm shall furnish to the official designated in the regulations promulgated pursuant to paragraph (2) information concerning such sale.

(2) Regulations--The information to be furnished under paragraph (1) shall be prescribed in regulations promulgated by the Secretary. Such regulations shall provide protection from pubic disclosure for such information, unless public disclosure is subsequently specifically authorized by the firm furnishing the information.

(d) Contents of Report--

(1) In General--Each report under subsection (a) shall include--

(A) a net assessment of the elements of the industrial base and technology base covered by the report;

(B) recommendations for appropriate remedial action under the authority of this Act, or other law or regulations;

(C) a summary of the findings and recommendations of any interagency studies conducted during the reporting period under subsection (b);

(D) a summary of offset arrangements concluded during the reporting period for which information has been furnished pursuant to subsection (c); and

(E) a summary and analysis of any bilateral and multilateral negotiations relating to the use of offsets completed during the reporting period.

(2) Alternative Findings or Recommendations--Each report required under this section shall include any alternative findings or recommendations offered by any departmental Secretary, agency head, or the United States Trade Representative to the Secretary.

(e) Utilization of Annual Report in Negotiations—

The findings and recommendations of the reports required by subsection (a), and any interagency reports and analyses shall be considered by representatives of the United States during bilateral and multilateral negotiations to minimize the adverse effects of offsets.

Appendix B

APPENDIX B:
ITEMIZED LIST OF INFORMATION COLLECTED ANNUALLY FROM INDUSTRY

Required Reporting on Offset Transactions

On an annual basis, industry is required to submit to the Department of Commerce an itemized list of offset transactions completed during the report period, with the following data elements:

Name of Country - Country of entity purchasing the weapon system, defense item or service subject to offset.

Name or Description of Weapon System, Defense Item, or Service Subject to offset.

Name of Fulfilling Entity - Entity fulfilling offset transaction (including first tier subcontractors).

Name of Offset Receiving Entity - Entity receiving benefits from offset transaction.

Offset Credit Value - Dollar value credits claimed by fulfilling entity including any intangible factors/multipliers.

Actual Offset Value - Dollar value of the offset transaction without multipliers/intangible factors.

Description of Offset Product/Service - Short description of the type of offset (e.g., co-production, technology transfer, subcontract activity, training, purchase, cash payment, etc.)

Broad Industry Category - Broad classification of the industry in which the offset transaction was fulfilled (e.g., aerospace, electronics, chemicals, industrial machinery, textiles, etc.)

Direct or Indirect Offset - Specify whether the offset transaction was a direct or indirect offset.

Name of Country in which Offset was Fulfilled - United States, purchasing country, or third country.

Offset transactions of the same type (same fulfilling entity, receiving entity, and offset product/service) completed during the same reporting period could be combined.

Reporting on Offset Agreements Entered Into

In addition to the itemized list of offset transactions completed during the specified time period, U.S. firms were asked to provide information regarding new offset agreements entered into during the year, including the following elements:

Name of Country - Entity Purchasing the Weapon System, Defense Item, or Service Subject to Offset.

Name or Description of Weapon System, Defense Item, or Service Subject to Offset.

Names/Titles of Signatories to the Offset Agreement

Value of Export Sale Subject to Offset (approximate)

Total Value of the Offset Agreement

Term of Offset Agreement (months)

Description of Performance Measures (e.g.,"best efforts", liquidated damages)

Appendix C

APPENDIX C:
PARTIAL LISTING OF PREVIOUS U.S. GOVERNMENT REPORTS

October 1985	***Assessment of the Effects of Barter and Countertrade Transactions on U.S. Industries*** - U.S. International Trade Commission**.**
December 1985	***The Impact of Offsets in Defense-Related Exports*** - Office of Management and Budget**.**
December 1986	***Second Annual Report on the Impact of Offsets in Defense-Related Exports*** - Office of Management and Budget.
December 1987	***Impact of Offsets in Defense-Related Exports: A Summary of the First Three Annual Reports*** - Office of Management and Budget.
December 1988	***Offsets in Military Exports*** - Office of Management and Budget**.**
April 1990	***Report on Offsets in Military Exports*** - Office of Management and Budget.
April 1996	***Military Exports: Offset Demands Continue to Grow*** - U.S. General Accounting Office.
May 1996	***Offsets in Defense Trade: A Study Conducted Under Section 309 of the Defense Production Act of 1950, As Amended*** - U.S. Department of Commerce
June 1997	***Policy Issues in Aerospace Offsets: Report of A Workshop*** - Board on Science, Technology, and Economic Policy, National Research Council.
August 1997	***Offsets in Defense Trade: A Study Conducted Under Section 309 of the Defense Production Act of 1950, As Amended*** - U.S. Department of Commerce
January 1998	***Symposium Papers on: Trends and Challenges in Aerospace Offsets*** - Board on Science, Technology, and Economic Policy, National Research Council.

Appendix D

U.S. DEPARTMENT OF COMMERCE
BUREAU OF EXPORT ADMINISTRATION
STRATEGIC ANALYSIS DIVISION
LIST OF PUBLICATIONS

Italics indicate forthcoming studies

NTIS PB#	PUBLICATION TITLE	NTIS Price	Target Date to NTIS
	Critical Technology Assessment: Assistive Technologies	**$95**	**Spring 1999**
PB 97-193023	***National Security Assessment of the U.S. High-Performance Military Explosives & Components Sector***	**$95**	**Fall 1998**
PB 98-148265	***Offsets in Defense Trade - Conducted under Section 309 of the Defense Production Act of 1950***	**$95**	**Summer 1998**
PB 98-100001	***Critical Technology Assessment: Optoelectronics***	**$95**	**Summer 1998**
PB 97-117782	**National Security Assessment of the Emergency Aircraft Ejection Seat Sector - November 1997**	**$95**	**On Sale**
PB 97-193015	**Offsets in Defense Trade - Conducted under Section 309 of the Defense Production Act of 1950 - August 1997**	**$95**	**On Sale**
PB 96-100011	**Critical Technology Assessment of the U.S. Semiconductor Materials Industry - April 1997**	**$95**	**On Sale**
PB 97-133789	**Offsets in Defense Trade - Conducted under Section 309 of the Defense Production Act of 1950 - May 1996**	**$95**	**On Sale**
PB 96-100045	**National Security Assessment of the Cartridge and Propellant Actuated Device Industry - September 1995**	**$95**	**On Sale**
PB 95-101382	**The Effect of Imports of Crude Oil and Petroleum Products on the National Security - February 1995**	**$95**	**On Sale**
PB 93-192409	**Critical Technology Assessment of U.S. Artificial Intelligence – August 1994**	**$95**	**On Sale**
PB 93-192433	**Critical Technology Assessment of U.S. Superconductivity – April 1994**	**$95**	**On Sale**
PB 93-192425	**Critical Technology Assessment of U.S. Optoelectronics - February 1994**	**$95**	**On Sale**
PB 93-182383	**Critical Technology Assessment of U.S. Advanced Ceramics - December 1993**	**$95**	**On Sale**
PB 93-192391	**Critical Technology Assessment of U.S. Advanced Composites - December 1993**	**$95**	**On Sale**

NTIS PB#	PUBLICATION TITLE	NTIS Price	Target Date to NTIS
PB 93-192441	The Effect of Imports of Ceramic Semiconductor Packages on the National Security - August 1993	$95	On Sale
PB 93-192458	National Security Assessment of the U.S. Beryllium Industry - July 1993	$95	On Sale
PB 93-154474	National Security Assessment of the Antifriction Bearings Industry - February 1993	$95	On Sale
PB 93-183721	National Security Assessment of the U.S. Forging Industry - December 1992	$95	On Sale
PB 93-192466	The Effects of Imports of Gears and Gearing Products on the National Security - July 1992	$95	On Sale
PB 93-183739	National Security Assessment of the Domestic and Foreign Subcontractor Base: A Study of Three U.S. Navy Weapon Systems - March 1992	$95	On Sale
PB 93-192474	National Security Assessment of the U.S. Semiconductor Wafer Processing Equipment Industry - April 1991	$95	On Sale
PB 93-192482	National Security Assessment of the U.S. Robotics Industry - March 1991	$95	On Sale
PB 93-192490	National Security Assessment of the U.S. Gear Industry - January 1991	$95	On Sale
PB 93-192516	Effects of Imports of Uranium on the National Security - September 1989	$55	On Sale
PB 93-192524	Effects of Crude Oil and Refined Petroleum Product Imports on the National Security - January 1989	$55	On Sale
PB 93-192532	Effects of Imports of Plastic Injection Molding Machines on the National Security - January 1989	$55	On Sale
PB 93-192540	Effects of Imports of Anti-Friction Bearings on the National Security - July 1988	$65	On Sale
PB 93-192557	Investment Castings: A National Security Assessment - December 1987	$65	On Sale
PB 93-192565	Joint Logistics Commanders/DOC Precision Optics Study - June 1987	$55	On Sale
PB 93-192573	An Economic Assessment of the U.S. Industrial Fastener Industry - March 1987	$55	On Sale
PB 93-192599	Joint Logistics Commanders/DOC Bearing Study - June 1986	$55	On Sale

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