OFFSETS IN DEFENSE TRADE

Seventh 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

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This is the seventh annual report on offsets in defense trade prepared pursuant to Section 309 of the Defense Production Act of 1950,[1] as amended (DPA). The Department of Commerce's Bureau of Industry and Security (BIS),[2] has been delegated responsibility for preparing the reports required under Section 309. To assess the impact of offsets in defense trade, the Department of Commerce obtained data from U.S. defense firms involved in defense offsets.

This report covers offset agreements and offset transactions entered into from 1993 through 2000. In addition, this report: (i) discusses the changes in the industrial base during the reporting period as a result of consolidations and mergers in the defense industry; (ii) reports on ongoing U.S. Government interagency activity and discussions with foreign government officials; (iii) provides summaries of offset agreements and transactions for the reporting period; and (iv) highlights procurement practices of other countries that utilize offsets.

1993-2000 Offset Activity

Total offset activity during 1993 to 2000 can be measured by the number and value of new offset agreements entered into between U.S. defense contractors and foreign governments, and the number and value of individual offset transactions carried out in fulfillment of offset agreements during the eight-year reporting period.

Offset Agreements, 2000: U.S. defense contractors reported entering into 25 new offset agreements with 10 different countries in 2000. The new offset agreements had a total value of $5.1 billion, and accounted for 89.7 percent of total U.S. defense export contract values ($5.7 billion). In comparison with the previous seven years, offset agreements as a percentage of total defense export contract sales were highest in 2000.

In 2000, European nations received offsets equal to 116 percent of the total export values, the highest offset percentage on record for any single year of the eight-year reporting period. For non-European nations, the offset percentage was 50 percent in 2000.
Offset Agreements, 1993-2000: U.S. companies reported entering into 345 offset agreements with 32 countries during the time period from 1993 to 2000. U.S. companies

[1] Codified at 50 U.S.C. app. § 2099 (2000).

reported export sales of 177 different defense systems or subsystems with a total value of $48.6 billion. Offset agreements related to those export contracts were valued at $29.8 billion, or 61 percent of the export contract value. Sales of aerospace defense systems (i.e., aircraft, engines, and missiles) were valued at $42.8 billion and accounted for nearly 90 percent of the total export contracts.

On a regional basis, Europe accounted for only 47 percent of total U.S. defense export contracts, while new offset agreements with Europe accounted for more than 70 percent of total offset agreements (by value). Asia and the Middle East each accounted for 14 percent of new offset agreements, and the Americas accounted for two percent. Non-European countries accounted for approximately one-third of new offset agreements (by value) but 53 percent of the total value of defense export contracts. While the non-European nations had higher defense export contract totals, Europe had a much greater offset impact on U.S. industry because of the higher offset percentages required by European purchasers.

Offset Transactions, 2000: U.S. companies reported offset transactions with a total actual value of $1.7 billion – down eight percent from the 1999 total of $1.8 billion, and the lowest total actual transaction value reported in any of the eight years. A decrease in offset transactions in 2000 was anticipated because of a drop in defense sales and offset agreements in previous years. However, increasing levels of defense sales (and higher related offset percentages) in 2000 likely will lead to more new offset agreements and, thus, an increase in offset transactions in the future.

Offset Transactions, 1993-2000: During the reporting period, U.S. companies reported 4,425 offset transactions executed in 35 countries. These offset transactions were related to 227 defense systems under existing offset agreements. The actual value of the offset transactions from 1993 to 2000 was just under $18 billion.

Conclusions

The defense environment changed in the 1990s, reflecting both the general retrenchment of military expenditures and tougher offset policies and enforcement worldwide. In recent years, offsets have become more important in winning procurements and, ultimately, in access to foreign markets by U.S. companies. Offset agreements with

[2] On April 18, 2002, the Bureau of Export Administration changed its name to the Bureau of Industry and Security.

values exceeding 100 percent of the total export contract value are occurring regularly; in fact, 100 percent seems to be the baseline.

From the U.S. perspective, Europe is clearly the central focus of offset activity, dominating both new offset agreements and the number of offset transactions with U.S. companies. Because 90 percent of offset agreements are aerospace-related, concerns about the competitiveness of U.S. aerospace prime contractors and the aerospace infrastructure have increased.

Using data submitted by industry and data from the Bureau of the Census, BIS estimates offsets maintained 41,666 work-years annually in the U.S. defense industry between 1993 and 2000. However, the data reported by U.S. companies also show that offsets displaced 9,688 work-years annually in the lower-tier companies that are suppliers or subcontractors to large U.S. defense companies.

The U.S. aerospace trade surplus fell from its all-time high of $40 billion in 1998 to approximately $27 billion in 2000. Imports of aerospace products have increased rapidly in the last decade for a number of reasons, including offsets. Offset agreements calling for aerospace subcontracting arrangements lead to increased imports, to the extent that they result in U.S. prime contractors importing subcontracted parts and systems rather than relying on domestic sources. Aerospace-related imports have increased regardless of the state of the market and despite the fact that the United States spends more on aerospace research and development than any other nation.

In the coming year, using authorities granted under the DPA, the Department of Commerce is committed to work with U.S. industry, the Department of Defense and other agencies, and foreign governments to analyze the impact of offsets on all parties. The Department of Commerce does not encourage or regulate the use of offsets in defense trade, and recognizes that offsets are market distorting. However, we also recognize that offsets are a part of the current international defense trade environment. We will seek ways to mitigate the negative effect of offsets on competition. Our goal is to support the U.S. defense industry and to ensure a robust and vibrant industrial base at all levels.

1. Background

1.1 Legislation and Regulations

In 1984, the Congress enacted amendments to the DPA, which included the addition of Section 309 addressing offsets in defense trade.[3] Section 309 of the DPA required the President to submit an annual report on the impact of offsets on the U.S. defense industrial base to the Congress's then-Committee on Banking, Finance, and Urban Affairs of the House of Representatives[4] and the Committee on Banking, Housing, and Urban Affairs of the Senate.

Initially, the Office of Management and Budget coordinated the interagency process of preparing the report for the Congress. Other agencies involved in the process included the Departments of Commerce, Defense, Labor, State, and Treasury, and the Office of the U.S. Trade Representative. In 1992, Section 309 of the DPA was amended, and the Secretary of Commerce was given the responsibility of preparing the report for the Congress, on the President's behalf, and was directed to function as the President's Executive Agent for carrying out responsibilities under Section 309 of the DPA.[5]

Under section 309, the Secretary of Commerce is authorized to develop and administer the regulations necessary to collect offsets data from U.S. defense exporters. The Secretary of Commerce delegated this authority to the Bureau of Industry and Security, which published its first offsets regulations in the *Federal Register* in 1994.[6] See Appendix B for a copy of the regulations as published.

The 1992 amendments to Section 309 of the DPA made other changes to the offset data collection process. The amendments lowered the offset agreement reporting threshold from $50 million to $5 million for U.S. firms entering into foreign defense sales contracts subject to offset agreements. Under the regulations, firms report all offset transactions for which they receive offset credits of $250,000 or more. Every year, U.S. companies

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[3] See Pub. L. 98-265, April 17, 1984, 98 Stat. 149.

[4] Section 309 of the DPA was amended in 2001 to change the name of the House committee to the "Committee on Financial Services of the House of Representatives." The annual report must be provided to the Committee on Banking, Finance, and Urban Affairs of the Senate as well. See 50 U.S.C. app. § 2099(a)(1).

[5] See Pub. L. 102-558, Oct. 28, 1992, 106 Stat. 4198; see also Part IV of Exec. Order No. 12919, 59 Fed. Reg. 29525 (June 3, 1994).

[6] See 59 Fed. Reg. 61796, Dec. 2, 1994, codified at 15 C.F.R. § 701.

report offset agreement and transaction data for the previous calendar year to BIS. The data elements collected each year from industry are listed in Section 701.4 of the Department's offset regulations and are shown in Appendix B.

1.2 The Official U.S. Government Policy

The official U.S. Government policy on offsets in defense trade was developed by an interagency offset team. The policy was announced by the President in April 1990, in a statement issued by the White House Press Secretary.[7] In 1992, it was set forth as a Policy of Congress as follows:

> (a) In General. Recognizing that certain offsets for military exports are economically inefficient and market distorting, and mindful of the need to minimize the adverse effects of offsets in military exports while ensuring that the ability of United States firms to compete for military export sales is not undermined, it is the policy of the Congress that--
>
> (1) no agency of the United States Government shall encourage, enter directly into, or commit United States firms to any offset arrangement in connection with the sale of defense goods or services to foreign governments;
>
> (2) United States Government funds shall not be used to finance offsets in security assistance transactions, except in accordance with policies and procedures that were in existence on March 1, 1992;
>
> (3) nothing in this section shall prevent agencies of the United States Government from fulfilling obligations incurred through international agreements entered into before March 1, 1992; and
>
> (4) the decision whether to engage in offsets, and the responsibility for negotiating and implementing offset arrangements, reside with the companies involved.
>
> (b) Presidential Approval of Exceptions. It is the policy of the Congress that the President may approve an exception to the policy stated in subsection (a) after receiving the recommendation of the National Security Council.
>
> (c) Consultation. It is the policy of the Congress that the President shall designate the Secretary of Defense to lead, in coordination with the Secretary of State, an interagency team to consult with foreign nations on limiting the adverse effects of offsets in defense procurement. The President shall transmit an annual report on the results of these consultations to the Congress as part of the report required under section 309(a) of the DPA.

[7] Congress incorporated this policy statement into law with the Defense Production Act Amendments of 1992 (Pub. L. 102-558, Title I, Part C, § 123, 106 Stat. 4198).

In 1999, the offset policy was supplemented by provisions contained in the Defense Offsets Disclosure Act of 1999.[8] Specifically, Congress made the following findings:

(1) A fair business environment is necessary to advance international trade, economic stability, and development worldwide, is beneficial for American workers and businesses, and is in the United States national interest.
(2) In some cases, mandated offset requirements can cause economic distortions in international defense trade and undermine fairness and competitiveness, and may cause particular harm to small- and medium-sized businesses.
(3) The use of offsets may lead to increasing dependence on foreign suppliers for the production of United States weapons systems.
(4) The offset demands required by some purchasing countries, including some close allies of the United States, equal or exceed the value of the base contract they are intended to offset, mitigating much of the potential economic benefit of the exports.
(5) Offset demands often unduly distort the prices of defense contracts.
(6) In some cases, United States contractors are required to provide indirect offsets which can negatively impact nondefense industrial sectors.
(7) Unilateral efforts by the United States to prohibit offsets may be impractical in the current era of globalization and would severely hinder the competitiveness of the United States defense industry in the global market...

The Defense Offsets Disclosure Act of 1999 continues with the following declaration of policy:

> It is the policy of the United States to monitor the use of offsets in international defense trade, to promote fairness in such trade, and to ensure that foreign participation in the production of United States weapons systems does not harm the economy of the United States.

[8] See Pub. L. No. 106-113, Div. B, § 1000(a)(7) 113 Stat. 1536, 1510A-500 to 1501A-505 (1999) (enacting into law Subtitle D of Title XII of Division B of H.R. 3427 (113 Stat. 1501A-500) as introduced on Nov. 17, 1999) (found at 50 U.S.C. Appx. Sec. 2099, History; Ancillary Laws and Directives).

1.3 Offsets Terminology

There are several basic terms used in discussions of offsets in defense trade. For more definitions and an illustrative example of an offset arrangement, please see the Glossary in Appendix F.

Offsets: 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 (22 U.S.C. § 2751, et seq.) and the International Traffic in Arms Regulations (22 C.F.R. §§ 120-130).

Direct Offsets: Contractual arrangements that involve defense articles and services referenced in the sales agreement for military exports. These transactions are directly related to the defense items or services exported by the defense firm and are usually in the form of co-production, subcontracting, technology transfer, training, production, licensed production, or financing activities.

Indirect Offsets: Contractual arrangements that involve defense goods and services unrelated to the exports referenced in the sales agreement. These transactions are not directly related to the defense items or services exported by the defense firm. The kinds of offsets that are considered "indirect" include purchases, investment, training, financing activities, marketing/exporting assistance, and technology transfer.

Co-production: Overseas production based upon government-to-government agreement that permits a foreign government or producer(s) to acquire the technical information to manufacture all or part of a U.S. origin defense article. Co-production includes government-to-government licensed production, but 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 defense prime contractor and a foreign producer.

Overseas Investment: Investment arising from an offset agreement, often taking the form of capital dedicated to establishing or expanding 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 defense prime contractor and a foreign entity.

1.4 Countries and Regions

For ease of analysis, and in some cases to protect company confidentiality, countries and country groups actively requiring offsets in connection with purchases of U.S. defense systems during the 1993-2000 period were divided into four geographic regions: Europe, the Middle East and Africa, North and South America, and Asia. The countries found in each region are listed in Table 1-1.

1.5 Scope of Report

This is the seventh report on *Offsets in Defense Trade* prepared by the Department of Commerce's Bureau of Industry and Security. This report is prepared after analyzing offset data reported to the Department of Commerce by U.S. defense firms, in compliance with regulations established under Section 309 of the DPA.

The seventh report reviews offsets data for the eight-year period from 1993 to 2000. This report was prepared in consultation with the Departments of Defense, Labor, and State; the Office of the U.S. Trade Representative; and the Central Intelligence Agency. The initial offsets report, issued in 1996, covered the time period from 1993 to 1994. Each of the six subsequent offset reports added an additional year to the reporting period.

Table 1-1: Purchasing Countries and Groups Requiring Offset Agreements, by Region	
Europe	**Middle East and Africa**
Austria	Egypt
Belgium	Israel
Czech Republic	Kuwait
Denmark	Saudi Arabia
EPG – The European Participating Group (Belgium, The Netherlands, Norway)	South Africa
	Turkey
Finland	United Arab Emirates
France	
Germany	**North and South America**
Greece	Brazil
Italy	Canada
Luxembourg	
NATO	**Asia**
The Netherlands	Australia
Norway	Indonesia
Portugal	Malaysia
Slovenia	New Zealand
Spain	Singapore
Sweden	South Korea
Switzerland	Taiwan
United Kingdom	Thailand

Source: U.S. Department of Commerce/BIS Offsets Database

This report begins with an overview of the data collected from U.S. industry for 1993-2000, followed by an analysis of the effects of offsets on the U.S. defense industrial base. Next, the report presents a statistical analysis of offset agreements entered into from 1993 through 2000, including consideration of the high level of concentration of offsets among a relatively few firms, countries, and weapon systems. The regional distribution of offset agreements is also reviewed, and a detailed comparison made of offset activity in European countries with the countries in the rest of the world. This chapter is followed by a similar analysis of offset transactions, by type of offset and by the nine categories, and in terms of the offset recipients. Next, the report presents a review of aerospace issues – specifically, the importance of exports to this sector along with recent offset trends in the U.S. aerospace industry. The next chapter provides a brief summary of other U.S. Government offset monitoring activities and is followed by the conclusions.

Some companies submitted data for 1999 offset agreements and transactions after the sixth report was drafted. Therefore, 1999 data on agreements and transactions were

revised upward in this report.

2. Statistical Overview

This chapter provides a general overview of offsets statistics collected by BIS from U.S. industry for the years 1993 through 2000 and a review of some of the terms used to organize the data for analysis. More detailed sections on agreements and transactions will follow in Chapters 4 and 5. Each year BIS grapples with classifying transactions correctly. In some cases, companies do not provide enough information to BIS so that it may correctly categorize the transactions. The result is a growing category called "miscellaneous," which is now the fourth largest category of offsets after technology transfer.

Miscellaneous offsets include marketing assistance, various studies, administrative costs, such as office expenses and travel, grants of various kinds, and many other incidentals, all valued at $1.6 billion. Further review indicated marketing assistance includes brokering and advertising, although the specific action is not always clear. Brokering means a foreign purchase by a firm other than the exporter and would normally be classified as a purchase (indirect offset). A "study" could be reclassified as technology transfer, although both the exporter and the foreign entity may benefit. BIS will continue to try to resolve these ambiguities for next year's report.

The following data points are used to organize and analyze the information collected:

1. Offset Agreement – Year – Country – Weapon System – Export Contract Value – Agreement Value – % Agreement Value to Export Value; and

2. Offset Transaction – Year – Country – Referenced Weapon System – Recipient – Actual Value – Credit Value – Multiplier (credit value ÷ actual value) – Type – Category – Description – Industry Identification.

2.1 General Overview

A summary of offsets activity for 1993 through 2000 is provided in Table 2-1. A more detailed discussion and analysis of the data follows in Chapters 4 and 5.

Table 2-1: General Summary of Offsets Activity
(in $ millions)

Offset Agreements

Year	Export Value	Offset Value	% Offset	Companies	Agreements	Countries	Defense Systems
1993	$13,957.0	$4,806.7	34.44%	18	30	17	27
1994	$4,792.4	$2,048.7	42.75%	18	49	20	38
1995	$7,402.0	$6,034.1	81.52%	19	45	18	33
1996	$2,987.8	$2,270.7	76.00%	15	50	19	32
1997	$5,822.8	$3,831.8	65.81%	13	57	19	42
1998	$3,257.8	$1,846.6	56.68%	11	44	17	34
1999	$4,681.2	$3,851.4	82.27%	10	45	11	36
2000	$5,653.1	$5,072.6	89.73%	7	25	12	18
8-Years	$48,554.3	$29,762.7	61.30%	37	345	32	177

Offset Transactions

Year	Actual Value	Credit Value	Multiplier	Companies	Transactions	Countries	Defense Systems
1993	$1,815.1	$2,162.1	1.191	24	440	27	60
1994	$1,891.1	$2,161.5	1.143	21	550	26	57
1995	$2,713.7	$3,390.8	1.250	20	670	27	69
1996	$2,731.5	$3,098.9	1.135	21	623	26	72
1997	$2,725.5	$3,276.2	1.202	18	577	26	59
1998	$2,364.8	$2,684.6	1.135	19	582	30	65
1999	$2,080.4	$2,824.1	1.358	13	512	25	63
2000	$1,671.5	$1,942.0	1.162	13	471	24	60
8-Years	$17,993.5	$21,540.3	1.197	40	4425	35	226

Source: BIS Offsets Database

2.2 Types of Offset Transactions

Table 2-2 shows offset transactions by type of offset, as well as the percentage distribution of each type of offset for each year from 1993 to 2000. Table 2-2 also shows the total actual and credit values of the offset transactions for each year. The percentage

Table 2-2: Offset Transactions by Type
(in $ millions)

Year	Total	Direct	Indirect	Unsp.	Direct	Indirect	Unsp.
	Actual Value				% Distribution		
1993	$1,815.1	$583.0	$1,106.0	$126.1	32.12%	60.93%	6.95%
1994	$1,891.1	$600.7	$1,129.5	$160.9	31.76%	59.73%	8.51%
1995	$2,713.7	$1,064.1	$1,649.6	NR	39.21%	60.79%	NR
1996	$2,731.5	$1,097.5	$1,553.8	$80.1	40.18%	56.89%	2.93%
1997	$2,725.5	$1,030.3	$1,570.7	$124.4	37.80%	57.63%	4.57%
1998	$2,364.8	$1,464.2	$895.3	$5.4	61.92%	37.86%	0.23%
1999	$2,080.4	$690.2	$1,351.0	$39.1	33.18%	64.94%	1.88%
2000	$1,671.5	$577.7	$997.7	$96.1	34.56%	59.69%	5.75%
Total	$17,993.5	$7,107.8	$10,253.7	$632.0	39.50%	56.99%	3.51%
Year	Credit Value				% Distribution		
1993	$2,162.1	$708.2	$1,323.0	$130.9	32.75%	61.19%	6.05%
1994	$2,161.5	$774.1	$1,221.9	$165.4	35.81%	56.53%	7.65%
1995	$3,390.8	$1,257.9	$2,132.9	NR	37.10%	62.90%	NR
1996	$3,098.9	$1,188.7	$1,795.6	$114.7	38.36%	57.94%	3.70%
1997	$3,276.2	$1,171.1	$1,952.3	$152.8	35.75%	59.59%	4.66%
1998	$2,684.6	$1,621.8	$1,055.1	$7.8	60.41%	39.30%	0.29%
1999	$2,824.1	$1,121.8	$1,599.5	$102.8	39.72%	56.64%	3.64%
2000	$1,942.0	$667.7	$1,174.9	$99.4	34.38%	60.50%	5.12%
Total	$21,540.3	$8,511.3	$12,255.3	$773.7	39.51%	56.89%	3.59%

Multiplier					# of Transactions			
Year	Total	Direct	Indirect	Unsp.	Total	Dir.	Ind.	Unsp.
1993	1.191	1.215	1.196	1.038	440	132	300	8
1994	1.143	1.289	1.082	1.028	550	157	383	10
1995	1.250	1.182	1.293	NR	670	203	467	NR
1996	1.135	1.083	1.156	1.432	623	220	397	6
1997	1.202	1.137	1.243	1.228	577	200	371	6
1998	1.135	1.108	1.179	1.450	582	237	342	3
1999	1.358	1.625	1.184	2.629	512	200	295	17
2000	1.162	1.156	1.178	1.035	471	157	304	10
Total	1.197	1.197	1.195	1.224	4,425	1,506	2,859	60

Source: BIS Offsets Database
NR=None Reported

difference between the actual value and the credit value for an offset transaction is the multiplier, which is shown at the bottom of Table 2-2. The credit value is a value that

some foreign governments provide as an incentive for certain kinds of offset transactions. This value varies greatly by country and by the kind of transaction (i.e., purchase, technology transfer, investment, etc.), but is normally more than the actual value. For the entire database, the multiplier is 1.197, which means the credit value is 19.7 percent more than the actual value. Offset transaction data are more fully discussed in Chapter 5.

2.3 Offset Transaction Categories

In addition to classifying offset transactions by type (direct or indirect), offset transactions are identified by various categories, which more particularly describe the nature of the arrangement or exchange. These categories include *Purchases, Subcontracts, Technology Transfers, Credit Assistance, Training, Overseas Investment, Co-production, Licensed Production,* and *Miscellaneous.*

Table 2-3 presents a summary of offset transactions by category for the eight year reporting period (1993-2000). Appendix F also contains a listing of relevant offset definitions. A brief description of each category follows:

Purchases result in overseas production of goods or services usually for export to the United States. Purchases are always classified as indirect offsets to distinguish them from subcontracts because the purchases are of items unrelated to the exported defense system. During the time period from 1993 to 2000, Purchases represented 35.2 percent of the value of all offset transactions. Purchases had a low multiplier of 1.065. The U.S. exporter does not always make the purchase. They can also involve brokering and marketing assistance that result in purchases by a third party.

Subcontracts result in overseas production of goods or services for use in the production or operation of a U.S. exported defense system subject to an offset agreement. Subcontracts are always classified as direct offsets. They are typically a contractual arrangement between the U.S. prime contractor and a foreign producer. During the reporting period, Subcontracts represented 28 percent of the value of all offset transactions, and 70 percent of the value of all direct offsets. Like Purchases, Subcontracts had a low multiplier (1.062).

Technology Transfer includes research and development conducted abroad, exchange programs for personnel, data exchanges, integration of machinery and equipment into a

recipient's production facility, technical assistance, education and training, manufacturing know-how, and licensing and patent sharing. Technology Transfer, as used here, is normally accomplished under a commercial arrangement between the U.S. prime contractor and a foreign company. A major subcontractor may also accomplish the Technology Transfer on behalf of the U.S. prime contractor. During the reporting period, 40 percent of Technology Transfers were classified as direct offsets and 60 percent were classified as indirect offsets. Altogether, Technology Transfers accounted for approximately 12 percent of the value of all offset transactions. The multiplier for technology transfers was 1.348.

Credit Assistance includes direct loans, brokered loans, loan guarantees, assistance in achieving favorable payment terms, credit extensions, and lower interest rates. Approximately 6.3 percent of the value of total offset transactions during the period from 1993 to 2000 (or $1.14 billion) were characterized as Credit Assistance. Credit Assistance is nearly always classified as an indirect offset transaction. (Only $4 million of the Credit Assistance transactions were classified as direct offsets during the reporting period). The multiplier for Credit Assistance was 1.135.

Training relates to the production, maintenance, or actual use of the exported defense system or a component thereof. Training may be required in areas such as computers, foreign language skills, engineering capabilities, or management. This category can be classified as either direct or indirect offset transactions, although more than 60 percent of the value of Training during the reporting period was classified as a direct offset transaction. Training accounts for only 3.75 percent of the total value of offset transactions. The multiplier for Training was 1.599.

Overseas Investments arising from offset agreements have the highest aggregate multiplier (2.834) of any category of offset transactions, indicating the desire of foreign governments to garner foreign investment. However, Overseas Investments account for only 2.7 percent of the value of all offset transactions, which may reflect its undesirability to U.S. prime contractors. It is also interesting to note that 43 of the 64 Overseas Investment transactions reported for 1993 through 2000 received no extra credit at all (i.e., had a multiplier of 1 or less). Overseas Investments sometimes took the form of capital invested to establish or expand a subsidiary or joint venture in the foreign country, but investments in third-party facilities also were reported (and such investments received the highest multiplier). Overseas Investments usually were classified as indirect offsets; only 10 percent of Overseas Investment transactions were classified as direct.

Co-production is overseas production based upon a government-to-government agreement that permits a foreign government or producer to acquire the technical information to manufacture all or part of a U.S.-origin defense system. Co-production is always classified as a direct offset. It includes government-to-government licensed production, but excludes licensed production based upon direct commercial arrangements by U.S. manufacturers. All Co-production reported for 1993 to 2000 was for component parts or equipment used in larger defense systems, and virtually all Co-production reported during this period was aerospace-related. During the reporting period, Co-production accounted for 2.4 percent of the value of offset transactions and had a multiplier of only 1.010 – the lowest among all offset transaction categories.

Past Co-production transactions have involved duplicating major production facilities in foreign countries (at the expense of the foreign government) for the assembly of entire defense systems, such as aircraft. Co-production arrangements of this kind generally impose the highest cost penalty on the foreign government of any category: after co-producing the items directly related to the defense system purchased, the production facilities can sit idle for lack of contracts to fulfill. Some countries pressure prime contractors for assembly contracts related to future sales to third countries.

Licensed Production is overseas production of a U.S.-origin defense article. Licensed Production differs from Co-production in that it is based on direct commercial arrangements between a U.S. manufacturer and a foreign entity as opposed to a government-to-government agreement. In addition, Licensed Production virtually always involves a part or component for a defense system, rather than a complete defense system. Licensed Production is the smallest among the offset categories, accounting for only 0.7 percent of the total value of offset transactions. The multiplier for Licensed Production was 1.376.

2.4 Industry Classification – SIC Codes

The Standard Industrial Classification (SIC) System allows for the classification of the entire U.S. economy into approximately 1,100 four-digit codes for the purpose of collecting and compiling economic statistics in a consistent manner by U.S. government agencies. The Office of Management and Budget (OMB) manages the SIC System in consultation with other U.S. Government agencies, such as the Commerce Department's Bureau of the Census and the Labor Department's Bureau of Labor Statistics. The SIC

Table 2-3: **Offset Transactions by Category and Type**								
Transaction Category	Actual Values in $ millions				Percent by Column Total			
	Total	Dir.	Ind.	Unsp.	Total	Dir.	Ind.	Unsp.
Purchases	$6,340.8	–	$5,973.2	$367.6	35.24%	–	58.25%	58.16%
Subcontracts	$5,040.0	$4,980.1	–	$59.9	28.01%	70.07%	–	9.48%
Technology Transfers	$2,188.5	$876.1	$1,222.1	$90.2	12.16%	12.33%	11.92%	14.28%
Miscellaneous	$1,584.4	$252.4	$1,322.2	$9.8	8.81%	3.55%	12.89%	1.55%
Credit Assistance	$1,138.1	$4.0	$1,134.1	–	6.32%	0.06%	11.06%	–
Training	$674.1	$417.8	$254.4	$1.9	3.75%	5.88%	2.48%	0.29%
Overseas Investment	$460.3	$48.7	$334.1	$77.5	2.56%	0.69%	3.26%	12.26%
Coproduction	$439.1	$438.0	–	$1.1	2.44%	6.16%	–	0.18%
Licensed Production	$128.3	$90.7	$13.6	$24.0	0.71%	1.28%	0.13%	3.80%
Total	$17,993.5	$7,107.8	$10,253.7	$632.0	100.00%	100.00%	100.00%	100.00%
Transaction Category	Credit Values in $ millions				Percent by Column Total			
	Total	Dir.	Ind.	Unsp.	Total	Dir.	Ind.	Unsp.
Purchases	$6,753.7	–	$6,381.7	$372.0	31.35%	–	52.07%	48.08%
Subcontracts	$5,351.4	$5,287.7	–	$63.7	24.84%	62.13%	–	8.23%
Technology Transfers	$2,949.6	$1,240.3	$1,617.6	$91.8	13.69%	14.57%	13.20%	11.86%
Miscellaneous	$2,191.1	$481.0	$1,637.6	$72.4	10.17%	5.65%	13.36%	9.36%
Credit Assistance	$1,291.9	$66.2	$1,225.7	–	6.00%	0.78%	10.00%	–
Training	$1,078.0	$637.4	$427.2	$13.4	5.00%	7.49%	3.49%	1.73%
Overseas Investment	$1,304.7	$247.2	$929.3	$128.2	6.06%	2.90%	7.58%	16.56%
Coproduction	$443.4	$442.3	–	$1.1	2.06%	5.20%	–	0.14%
Licensed Production	$176.5	$109.1	$36.1	$31.2	0.82%	1.28%	0.29%	4.04%
Total	$21,540.3	$8,511.3	$12,255.3	$773.7	100.00%	100.00%	100.00%	100.00%
Transaction Category	Multiplier				# of Transactions			
	Total	Dir.	Ind.	Unsp.	Total	Dir.	Ind.	Unsp.
Purchases	1.065	–	1.068	1.012	2,131	–	2,107	24
Subcontracts	1.062	1.062	–	1.063	1,029	1,015	–	14
Technology Transfers	1.348	1.416	1.324	1.017	441	193	244	4
Miscellaneous	1.383	1.906	1.239	7.392	358	75	278	5
Credit Assistance	1.135	16.558	1.081	–	79	6	73	–
Training	1.599	1.526	1.679	7.038	181	80	96	5
Overseas Investment	2.835	5.076	2.782	1.654	64	3	56	5
Coproduction	1.010	1.010	–	1.014	112	111	–	1
Licensed Production	1.376	1.203	2.656	1.301	30	23	5	2
Total	1.197	1.197	1.195	1.224	4,425	1,506	2,859	60

Source: BIS Offsets Database

System was officially replaced by the North American Industrial Classification System (NAICS) in April 1997 to update the codes and integrate industry in Canada and Mexico

into the system as a result of the North American Free Trade Agreement. SIC codes remain valid for classifying the substance of offsets, although the changeover to the NAICS Codes is an option for future offsets reports.

SIC identification is based on company-provided descriptions of offset transactions and may be linked to known offset recipient activities and other reporter-provided information. The offset transaction data reported describe transactions in detail that are roughly equivalent to the two-digit SIC group level, although the reporting companies frequently provided more detailed descriptions. BIS used this detail to define narrower industry sectors, sometimes at the three- and four-digit SIC levels. .

Table 2-4 provides a listing of offset classifications at the two-digit SIC group level. SIC 37 – Transportation Equipment, which includes most aerospace production, accounts for more than half of the total value of offset transactions and nearly two-thirds the value of direct offsets.

Table 2-4: Listing of Offset Transactions by Major Industrial Sector and Offset Type

(in $ millions)

2-Digit SIC and Sector Description		Total	Dir.	Ind.	Unsp.	Total	Dir.	Ind.	Unsp.
07	Agriculture	42.0		42.0		0.23%	0.00%	0.41%	0.00%
13	Crude Petroleum & Natural Gas	14.7		14.7		0.08%	0.00%	0.14%	0.00%
15	Building Construction	26.0	11.6	14.4		0.14%	0.16%	0.14%	0.00%
16	Heavy Construction	1.5	1.2	0.3		0.01%	0.02%	0.00%	0.00%
17	Construction – Specialty Trades	20.2		20.2		0.11%	0.00%	0.20%	0.00%
20	Food & Kindred Products	15.5		15.5		0.09%	0.00%	0.15%	0.00%
22	Textile Mill Products	6.4		6.4		0.04%	0.00%	0.06%	0.00%
23	Apparel & Other Finished Prods.	3.8		3.8		0.02%	0.00%	0.04%	0.00%
24	Lumber & Wood Products	0.3		0.3		0.00%	0.00%	0.00%	0.00%
25	Furniture & Fixtures	0.3		0.3		0.00%	0.00%	0.00%	0.00%
26	Paper Mills & Allied Products	21.1		21.1		0.12%	0.00%	0.21%	0.00%
27	Printing & Publishing	33.9	23.9	5.2	4.8	0.19%	0.34%	0.05%	0.76%
28	Chemicals & Allied Products	118.6	9.2	109.5		0.66%	0.13%	1.07%	0.00%
29	Petroleum Refining	3.2		3.2		0.02%	0.00%	0.03%	0.00%
30	Rubber & Misc. Plastics Products	4.9		4.9		0.03%	0.00%	0.05%	0.00%
32	Cut Stone & Stone Products	12.9		12.9		0.07%	0.00%	0.13%	0.00%
33	Primary Metal Industries	156.1	5.4	150.6		0.87%	0.08%	1.47%	0.00%
34	Fabricated Metal Products	521.1	119.9	298.2	103.1	2.90%	1.69%	2.91%	16.31%
35	Industrial Machinery, Exc. Electr.	1,311.1	126.6	1,184.5		7.29%	1.78%	11.55%	0.00%
36	Electronic/Electrical Equipment	2,326.9	783.5	1,530.6	12.7	12.93%	11.02%	14.93%	2.01%
37	Transportation Equipment	9,015.5	4,597.5	3,942.2	475.8	50.10%	64.68%	38.45%	75.29%
38	Measuring & Analyzing Instru.	948.6	698.1	250.5		5.27%	9.82%	2.44%	0.00%
38	Misc. Services	5.0	5.0			0.03%	0.07%	0.00%	0.00%
39	Misc. Manufacturing Industries	5.1	0.0	5.1		0.03%	0.00%	0.05%	0.00%
42	Motor Freight & Warehousing	1.5		1.5		0.01%	0.00%	0.01%	0.00%
44	Water Transportation	40.2		40.2		0.22%	0.00%	0.39%	0.00%
45	Transportation By Air	70.1	55.1	15.0		0.39%	0.77%	0.15%	0.00%
47	Transportation Services	3.5	0.0	3.4		0.02%	0.00%	0.03%	0.00%
48	Communications	55.2	1.1	54.1		0.31%	0.01%	0.53%	0.00%
49	Electric, Gas, & Sanitary Services	1.1		1.1		0.01%	0.00%	0.01%	0.00%
61	Non-Depository Credit Insts.	562.7	7.6	555.1		3.13%	0.11%	5.41%	0.00%
67	Holding & Other Investment Off.	409.4	22.3	363.6	23.6	2.28%	0.31%	3.55%	3.73%
73	Business Services	904.8	218.3	675.8	10.7	5.03%	3.07%	6.59%	1.70%
76	Miscellaneous Repair Shops	8.5	2.4	6.1		0.05%	0.03%	0.06%	0.00%
80	Health Services	0.0		0.0		0.00%	0.00%	0.00%	0.00%
81	Legal Services	0.1		0.1		0.00%	0.00%	0.00%	0.00%
82	Educational Services	356.3	180.4	175.8		1.98%	2.54%	1.71%	0.00%
87	Technical Services & Consultants	838.2	174.0	662.8	1.3	4.66%	2.45%	6.46%	0.21%
89	Misc. Services	50.6	32.4	18.2		0.28%	0.46%	0.18%	0.00%
99	Undetermined	77.0	32.3	44.7		0.43%	0.45%	0.44%	0.00%
	Total	$17,993.5	$7,107.8	$10,253.7	$632.0	-	-	-	-

Source: BIS Offsets Database

2.5 Countries and Regions

For ease of analysis, and in some cases to protect company confidentiality, countries actively requiring offsets in connection with defense export sales during the 1993-2000 period were categorized into four geographic regions: Europe, North and South America, the Middle East and Africa, and Asia. The countries found in each region, together with the aggregate percentage offsets required and the multiplier for each country, are shown in Table 2-5.

Table 2-5: Countries with Offset Agreements and Transactions By Region

EUROPE		
Country	% Offsets	Multiplier
Austria	W	1.000
Belgium	W	1.002
Czech Republic	W	W
Denmark	100.0%	1.114
Finland	W	1.071
France	W	1.722
Germany	100.0%	1.000
Greece	111.4%	2.129
Italy	98.5%	1.000
Luxembourg	NR	W
Netherlands	124.1%	1.280
Norway	99.7%	1.363
Portugal	27.9%	2.186
Slovenia	W	NR
Spain	91.6%	1.273
Sweden	103.9%	1.141
Switzerland	77.9%	1.008
United Kingdom	90.0%	1.007
Region Total	92.3%	1.156

N. AND S. AMERICA		
Country	% Offsets	Multiplier
Brazil	W	W
Canada	89.7%	1.010
Region Total	90.8%	1.013

MIDDLE EAST AND AFRICA		
Country	% Offsets	Multiplier
Egypt	NR	W
Israel	50.8%	1.037
Kuwait	30.3%	W
Saudi Arabia	34.9%	1.000
South Africa	W	NR
Turkey	58.8%	1.086
United Arab Emirates	55.3%	2.333
Region Total	44.0%	1.139

ASIA		
Country	% Offsets	Multiplier
Australia	35.1%	1.045
Indonesia	NR	1.213
Malaysia	37.3%	1.118
New Zealand	W	W
Singapore	W	2.352
South Korea	40.8%	1.412
Taiwan	20.6%	2.306
Thailand	24.9%	W
Region Total	26.2%	1.499

Source: BIS Offsets Database

Notes: NR=None Reported; W=Withheld to protect company proprietary information

3. Impact of Offsets on the U.S. Defense Industrial Base

3.1 Defense Preparedness

Offsets enhance the defense preparedness of the United States in several ways. Exports and the revenue generated by export sales are crucial to producers of U.S. defense systems and, by extension, to U.S. foreign policy and economic interests; almost all purchasers of U.S. defense systems require offset agreements as a condition of the sale. Exports of major defense systems help defray high overhead costs for the U.S. producer and help maintain production facilities and expertise, should they be needed to respond to a national emergency. Exports also provide additional business to many U.S. subcontractors and lower-tier suppliers, promote interoperability of weapon systems between the United States and allied countries, and add positively to U.S. international account balances. An offset package – particularly one with a high proportion of subcontracting or purchases – can undo or reduce many of these benefits.

However, offsets also can have negative effects on the nation's defense preparedness and the broader U.S. economy. Viewed in isolation, offsets often reduce spending in the United States and increase spending and investment in foreign countries. U.S. subcontractors displaced through direct offsets by foreign suppliers are among the groups most directly affected by offsets. Such direct offsets create foreign competitors for U.S. industry and run the risk of increasing the proliferation of technology to third countries. Moreover, with indirect offsets outpacing direct offsets 60 to 40 percent, the defense industrial base may not bear the full impact of offsets.

3.2 Employment

Offsets also affect employment levels in the defense sector. Although it is difficult to precisely determine the impact of offset agreements and transactions on employment in the U.S. defense sector, BIS has developed a reliable estimate by using employment data collected by the Bureau of the Census. Given that sales of aerospace weapon systems account for nearly 90 percent of the value of defense exports connected with offset agreements, this method appears to provide a reliable estimate.

For the period from1993 to 2000, industry reported approximately $48.6 billion in defense export contracts with an offset agreement attached. According to the Annual

Survey of Manufactures,[9] the value added per employee for the aerospace product and parts manufacturing industry in 2000 was $145,802. Dividing this figure into the defense export sales total results in a total of 333,329 work-years that were supported over the eight-year period by defense exports associated with offset agreements, or approximately 41,666 work-years annually.

However, by their very nature, subcontracting and purchasing offset transactions are most likely to shift sales from U.S. suppliers to overseas firms. Other categories of offset transactions, in the short or long run, can shift sales from U.S. suppliers as well. To be conservative, BIS bases its estimate of employment impacts only on subcontracting and purchasing transactions. Between 1993 and 2000, subcontracting transactions were valued at $5 billion and purchasing transactions were valued at $6.3 billion, for a total of $11.3 billion for the period, or an average of $1.41 billion per year in displaced sales. Dividing $1.41 billion by $145,802 (the value added by each worker in the aerospace industry in 2000) results in the loss of approximately 77,502 work-years over the eight-year period, or 9,688 work-years annually.

Based on these calculations, it appears that offset agreements and transactions had a net positive effect on employment in the defense sector during the period from 1993 to 2000.

[9] See the U.S. Census Bureau website at http://www.census.gov/prod/www/abs/industry.html

4. Offset Agreements Activity, 1993-2000

4.1 Overview

From 1993 to 2000, 37 U.S. firms reported entering into 345 offset agreements with a total value of $29.8 billion. These offset agreements were made with foreign purchasers in 32 different countries and were associated with defense export contracts valued at $48.6 billion. The exports involved 177 U.S. weapon systems. The value of the offset agreements represented 61.3 percent of the total value of the related export contracts during the entire reporting period.[10] The average term for completing the offset agreements was 111 months, or slightly more than nine years.[11] The percentage of offset agreements to export contracts (by value) reached a new high in 2000 of 89.7 percent, eclipsing the previous high of 82.3 from 1999. The lowest percentage was recorded in 1993 at 34.4 percent.

The annual values of defense export contracts and offset agreements (including offset percentages) are presented in Chart 4-1. In a sharp upward trend, the value of the offset agreements as a percentage of the value of defense export contracts increased an average of approximately six percent per year over the eight-year reporting period.[12]

4.2 Offsets Concentration

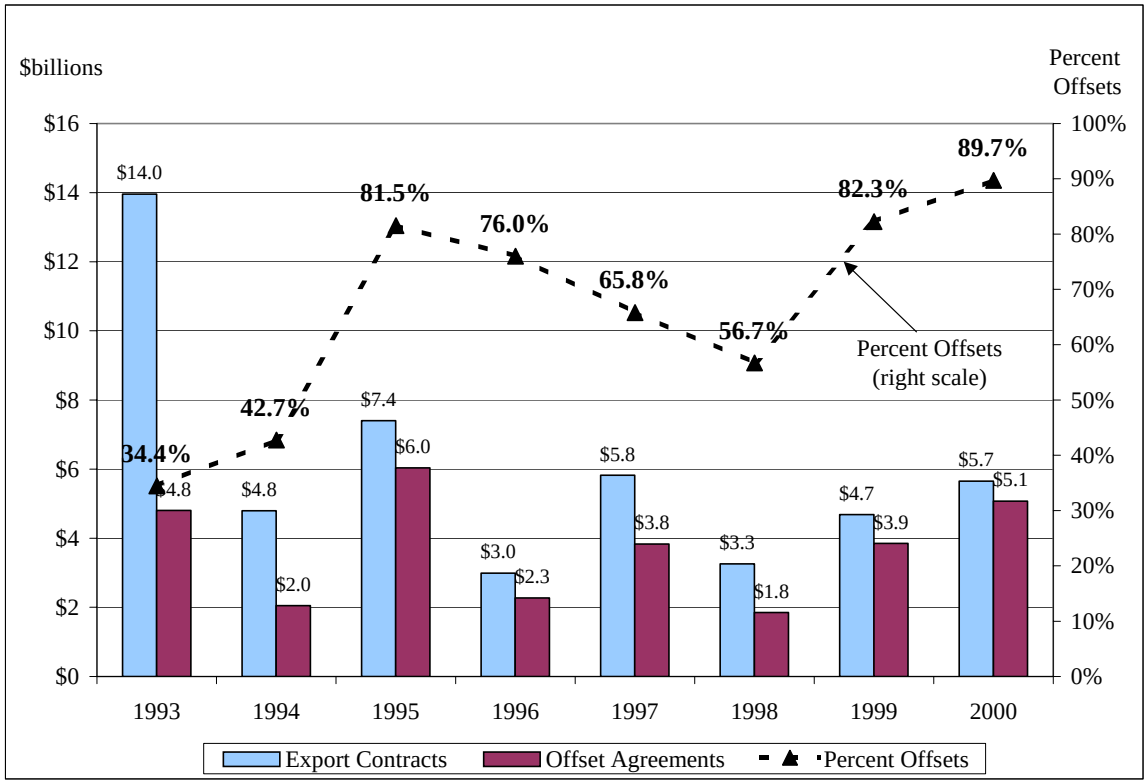
The data reported by U.S. companies show that a small number of companies, countries, and weapon systems dominated offset agreements during the reporting period. The top five U.S. companies (of 37 companies reporting data on offsets) accounted for 80.5 percent of the defense export contracts and 81.4 percent of the offset agreements during the reporting period. This high level of market concentration reflects the high costs of modern defense systems and the small number of firms that produce them. Due to the complexity and expense involved, only a large, multi-disciplined company could produce

[10] The figure of 61.3 percent is weighted to the annual values of export contracts and agreements. An unweighted average can be calculated by averaging the annual percentages of offsets. The unweighted result was 66.1 percent.

[11] A weighted average was calculated based on the value and term of each offset agreement.

[12] The percent increase was calculated using a linear least-squares function of only the annual percent values.

Chart 4-1: Reported Export Contracts and Offset Agreements Annually, 1993-2000 (in $ billions)



Source: BIS Offsets Database

and deliver modern defense systems. In addition, each exporter company coordinated the activities of hundreds, if not thousands, of subcontractors and suppliers that contributed to the systems production, as well as the work of thousands of employees.

Offsets also appear to be concentrated in a few purchaser countries. The top five countries (of a total of 32 involved in the reported offset activity) accounted for 58.4 percent of the total defense system purchases and 55.6 percent of the total offset agreements. The top 10 countries represented 78.7 percent of defense system purchases and 79.2 percent of the offset agreements. The fact that relatively few countries accounted for the bulk of offset activity indicates that relatively few countries were in the market for big-ticket defense equipment. Most countries cannot afford these systems. By dominating offset activity, these few countries also dominated the impact offsets have on the U.S. defense industrial base. In addition, these countries set a visible standard for offset demands for other countries to imitate.

The data reported by U.S. companies also show that specific defense systems were in high demand overseas. The top five weapon systems (of the 177 weapon systems sold) were all aircraft. These exports accounted for 45.6 percent of the value of all export contracts and 39.2 percent of the offset agreements during the reporting period. The top 10 defense systems accounted for 61.5 percent of the export contracts and 59.4 percent of the offset agreements during the reporting period. These data show once again that big-ticket items such as aircraft constituted the bulk of offset activity.

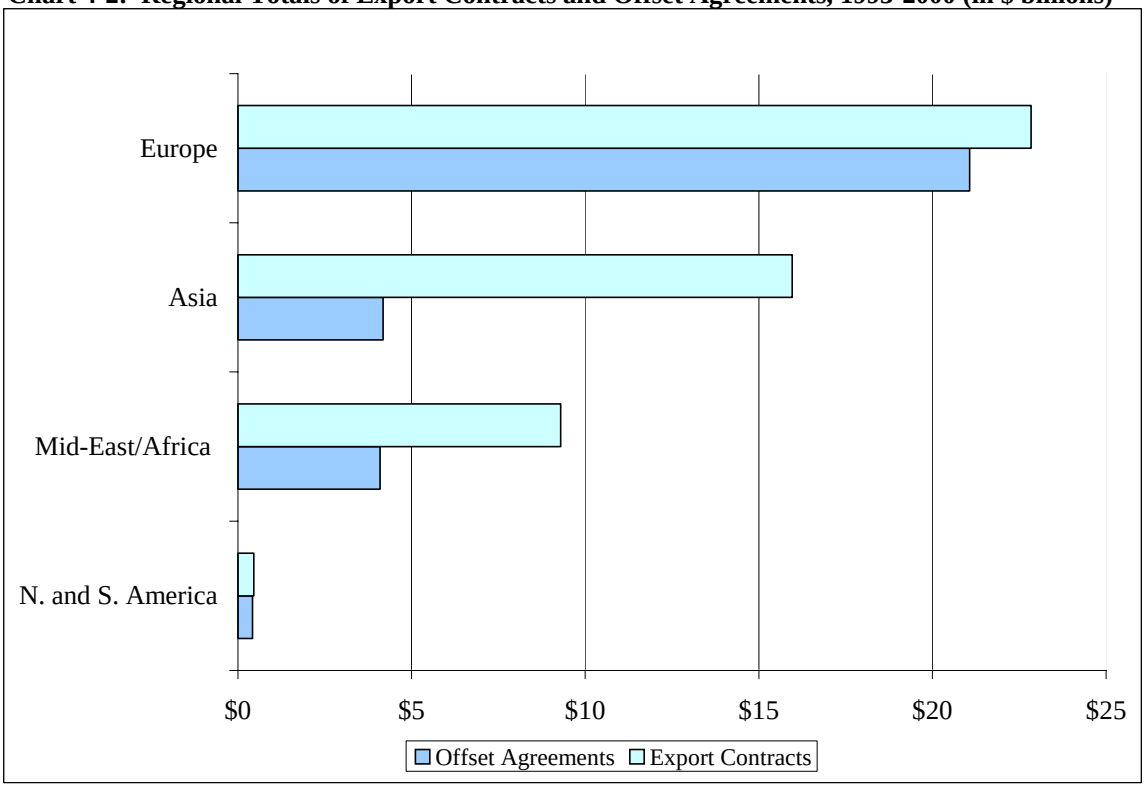
4.3 Regional Distributions

European countries dominated offset activity during the reporting period. Europe alone accounted for more than 70 percent of offset agreements during the reporting period, while at the same time accounting for less than 50 percent of the value of U.S. defense export contracts. Asian countries ranked a distant second in both categories, accounting for only 14 percent of offset agreements and 33 percent of related U.S. export contract values. Middle Eastern and African countries also had significant shares, accounting for nearly 14 percent of offset agreements and 19 percent of U.S. export contract business. Countries in North and South America (Canada and Brazil) were less significant, accounting for approximately one percent of the value of both offset agreements and related U.S. defense export contracts. Chart 4-2 shows regional totals of U.S. defense export contracts and offset agreements for 1993 to 2000.

4.4 Europe vs. All Other Countries

As noted above, Europe alone accounted for more than two-thirds (70.8 percent) of total offset agreements (by value), but less than half (47.5 percent) of the value of U.S. defense export contracts. These figures show the impact of the high offset percentages typically demanded by European nations in connection with U.S. defense export sales. The average offset percentage demanded by the 17 European countries involved in offset activity during the eight-year reporting period was 92.3 percent of the export contract values – a percentage which was higher than any other region. U.S. firms reported entering into 176 offset agreements with European countries during the eight-year period for a total value of $21.6 billion. These offset agreements ranged from less than $10 million to more than $1.8 billion in offset demands, and averaged $118 million per agreement. The average offset agreement had a term of 114 months, with a few agreements lasting up to 180 months.

Chart 4-2: Regional Totals of Export Contracts and Offset Agreements, 1993-2000 (in $ billions)



Source: BIS Offsets Database

Many European governments require a minimum of 100 percent offsets on purchases of foreign defense systems. Of the 176 offset agreements with Europe reported, 132 (75 percent) had offset percentages of 100 percent or more. The value of the negotiated offset package was greater than 100 percent of the defense contract value on 15 occasions, including one for which the offset percentage was 200 percent. As shown in Table 4-1, the offset percentages for Europe in both 1995 and 2000 exceeded 100 percent of the export contract values. In 2000, the offset percentage for Europe reached a new high of 116.3 percent.

As shown in Table 4-1, the 15 countries representing all other regions (i.e., non-European countries) accounted for less than one-third (29.2 percent) of offset agreements (by value), but more than half (52.5 percent) of reported U.S. defense export contracts, resulting in an offset percentage for the reporting period of 33.9 percent. Non-European countries accounted for 166 offset agreements that totaled $8.7 billion during the reporting period, or two-fifths of the European total. The average offset agreement for non-European countries was valued at $52 billion and had a term of 104 months.

Table 4-1: **Offset Requirements: Europe vs. Rest of World** Annually 1993-2000						
Yearly Totals	Area	# of Deals	Export Contracts (in $ millions)	Offset Agreements (in $ millions)	Percent Offsets	Duration (in months)
1993	Europe	14	$2,932.3	$2,338.1	79.7%	132
	Non-Europe	16	$10,972.0	$2,468.7	22.5%	117
	World	30	$13,904.4	$4,806.7	34.6%	124
1994	Europe	20	$1,502.7	$764.8	50.9%	99
	Non-Europe	29	$3,284.2	$1,283.9	39.1%	102
	World	49	$4,786.9	$2,048.7	42.8%	101
1995	Europe	26	$4,944.3	$5,159.2	104.3%	132
	Non-Europe	19	$2,457.7	$874.9	35.6%	98
	World	45	$7,402.0	$6,034.1	81.5%	127
1996	Europe	34	$1,924.2	$1,919.1	99.7%	110
	Non-Europe	16	$1,033.6	$351.5	34.0%	73
	World	50	$2,957.7	$2,270.7	76.8%	104
1997	Europe	28	$3,732.6	$3,043.8	81.5%	115
	Non-Europe	29	$2,090.2	$788.0	37.7%	91
	World	57	$5,822.8	$3,831.8	65.8%	110
1998	Europe	21	$1,390.3	$1,200.3	86.3%	115
	Non-Europe	23	$1,867.5	$646.4	34.6%	111
	World	44	$3,257.8	$1,846.6	56.7%	113
1999	Europe	22	$2,968.7	$2,708.0	91.2%	69
	Non-Europe	23	$1,699.0	$1,143.4	67.3%	94
	World	45	$4,667.7	$3,851.4	82.5%	75
2000	Europe	14	$3,384.7	$3,936.6	116.3%	113
	Non-Europe	11	$2,268.4	$1,136.0	50.1%	106
	World	25	$5,653.1	$5,072.6	89.7%	111
Grand Totals	Europe	179	$22,838.1	$21,069.9	89.9%	114
	Non-Europe	166	$25,672.6	$8,692.8	33.9%	104
	World	345	$48,554.3	$29,762.7	61.3%	111

Source: BIS Offsets Database

Two significantly large defense export contracts in 1993 – one to Taiwan with unusually low offset requirements and another to Saudi Arabia – significantly lowered the offset percentage in non-European nations. Excluding these sales, the average offset percentage for the eight-year period would have been almost 10 points higher. In addition, Middle Eastern countries and certain countries in the Pacific Area generally demand lower offset levels. Of the 166 offset agreements with non-European countries

that were reviewed, 110 (two-thirds) had offset percentages of 50 percent or less. Only 28 (one-sixth) of the offset agreements had percentages of 100 percent or more, and 10 of these had offset percentages in excess of 100 percent. Indeed, one offset agreement had an offset percentage of 333 percent, although this was associated with a relatively small defense export contract.

Of the 28 offset agreements with offset percentages of 100 percent or more, 10 were with Canada and another five were with Turkey. While the average offset percentage has been much lower in the rest of the world than in Europe, offset percentages in non-European countries appear to be rising. For example, in 1999, the offset percentage demanded by non-European countries peaked (64.8 percent), followed in 2000 by the second highest level of 50.1 percent.

In general, the data show that countries with more technically advanced economies have demanded higher levels of offsets than other countries. This could be explained by many factors, including the fact that large government expenditures on imports are likely to be closely scrutinized in the media and protested by local politicians. Thus, offsets often are used to temper political opposition to purchases of foreign defense systems. In addition, more advanced economies are able to absorb more offsets. Typically, their infrastructures are more advanced, and they are more likely than other countries to have in place already a diverse pool of industries among which to distribute offset transactions.

4.5 Are Offset Demands Increasing?

The data appear to show that offset demands are not only increasing, but more countries outside of Europe are demanding greater offsets. One reason for this is that the supply of defense systems greatly exceeds the demand for such items. In the last decade, shrinking worldwide defense expenditures and the overcrowding in the defense supplier sector have forced defense industries in many nations to consolidate. Overcapacity still plagues the defense sector, including in the United States, as governments have been slow to retrench.

However, as sales opportunities narrowed, competition for such sales became more intense. Because one element of competitiveness is the offset package, U.S. suppliers are forced to offer greater offsets to win sales. In addition, foreign purchasing governments are under pressure to sustain their indigenous defense companies and, accordingly, are demanding more offsets. Higher than normal overhead related to low levels of capacity

utilization in defense industries coupled with competitive pressures on prices have also squeezed corporate profits. While the need to export has grown stronger, so has the exporters' willingness to meet foreign purchasers' offset demands.

In recent years, the world economy has been sluggish, with historically higher unemployment in the last decade – notably in Europe and Japan. These conditions drained national treasuries and, therefore, significant public outlays for foreign-made weapon systems become are controversial, which leads to higher offset demands to deflect political pressure.

In addition, many countries now have formalized their offset requirements by establishing a minimum percentage for offsets at which to begin negotiations. In these situations, competing firms must design a winning offset package based on the desirability of the defense system, their ability to deliver offsets, and past offset performances. Many U.S. defense systems, such as aircraft and missiles, have an edge in the international market because of their superior performance capabilities. This alone may make U.S. exports the first choice of the foreign purchasing government and may actually help keep offsets at or near a minimum. However, the actual content of the offset package often is very desirable and helps close the deal. By this logic, less desirable weapon systems would pay an offset premium, thereby driving up offsets and further enhancing the foreign government's bargaining position with respect to all potential sellers.

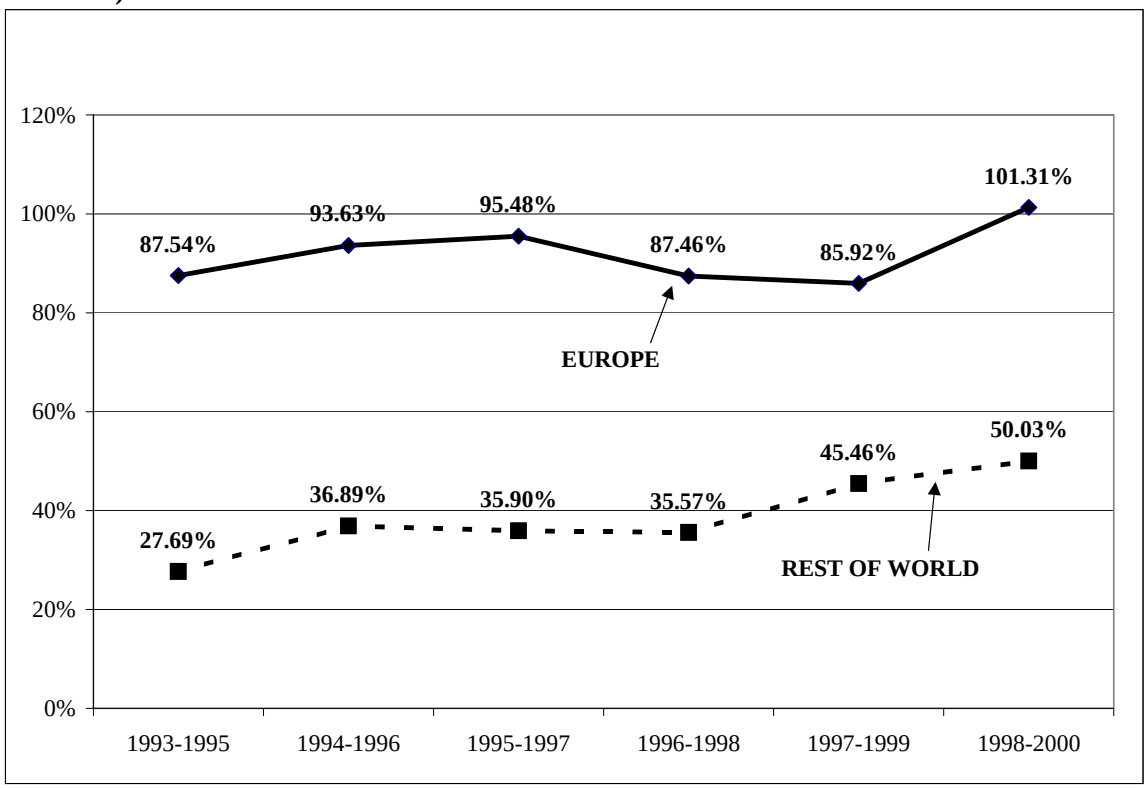
On a regional basis, the eight-year trend in offset percentages for European countries increased at an annual rate of 4.7 percent. For the rest of the world, the average increase in offset percentages was 4.0 percent. The fact that both regional trends are less than the world average increase in offset percentage of six percent results from commingling the very low rates of the rest of the world with the already high rates of Europe.

Offset demands are stable in many countries, while others are growing. To a large extent, the observed aggregate rates depend on the specific countries involved in offset activity in any one year. Along with country purchasing patterns, annual offset percentage calculations also are affected by the actual size of the offset agreements (i.e., one or two large offset agreements can dominate the annual figures). These annual fluctuations can be lessened somewhat by calculating three-year moving and weighted

averages that are a better indicator of offset trends.[13] The world trend in offset percentages was still sharply upward at 5.34 percent, but the average was exaggerated by differences between Europe and all other countries. Three-year weighted regional trends, one for Europe and one for all other countries, tell a different story, as shown in Chart 4-3.

Three-year weighted averages of offset percentages for Europe show an insignificant average annual rise of only one-tenth of a percent.[14] The offset percentage for the final three-year period (1998-2000), however, was 101.3 percent, changing what would have been a downward sloping trend from previous periods into a slightly positive trend. This trend suggests that Europe's offset requirements may be saturated at over 90 percent, although the next two years (2001 and 2002) will be buttressed at a higher level by 2000's record high offset percentage of 116.3 percent. The conclusion is that Europe's already high offset requirements may be rising, but at a slow rate. Much depends on which countries demand offsets in the future.

Chart 4-3: Percentage Offsets for Europe vs. Rest of World (3-year Weighted Moving Average, 1993-2000)



Source: BIS Offsets Database

[13] Here, the value of export contracts and offset agreements is totaled for each successive three-year period, beginning with 1993-1995, followed by 1994-1996, and so forth, then the offset percentage is determined. This leads to six three-year observations over the eight-year reporting period (1993-2000).

[14] The one-tenth of a percent annual calculation is based on a simple linear, least-squares average.

Offset demand in Eastern European countries is another factor leading to a rise in overall offset percentages. Poland's announced intention to purchase a fighter aircraft with a requirement of offsets of up to 200 percent of the value of the contract underscores a desire on the part of Central and Eastern European countries to use offsets as a policy tool for economic development. While this percentage is high, "developmental" offsets (i.e., those calling for direct investment, credit assistance, and technology transfer) usually warrant higher multipliers, which soften the real impact of offsets on the U.S. defense industrial base. Nonetheless, it appears offset demands in Central and Eastern Europe will be high in the future.

In conclusion, Western Europe may be nearing a ceiling in offset demands, which moderates the degree offsets can be increased. The rest of the world has plenty of room to grow and has shown signs of demanding more offsets. With Western European producers providing more competition to U.S. firms in the future, offsets are almost certain to increase in other regions of the world.

5. Offset Transaction Activity, 1993-2000

Offset transactions form the basis upon which the impacts of offsets on the U.S. defense industrial base are estimated. For the purpose of analysis, offset transactions were grouped by type (i.e., direct, indirect, and unspecified), and then sub-grouped into the nine categories described in Chapter 2 (Purchases, Subcontracts, Technology Transfers, Training, Overseas Investment, Co-production, Licensed Production, and Miscellaneous).

5.1 Overview

During the time period 1993 to 2000, 40 U.S. defense companies reported 4,425 offset transactions with a total value of $18 billion.[15] The reported offset transactions were completed with 1,602 recipients in 35 different countries. The offset transactions were conducted in fulfillment of 226 U.S. weapon system exports, some dating from the 1980s. U.S. firms received a total of $21.5 billion in credit toward open offset obligations during the reporting period, yielding a composite multiplier of 1.197 (i.e., credit value divided by offset value). Roughly one in eight offset transactions (556 in all) earned extra credit (i.e., had a multiplier greater than 1). The average yearly offset transaction value was $2.25 billion.

Approximately half of the value of reported offset transactions (50.7 percent) was in furtherance of offset agreements entered into before 1993 (before BIS began collecting offsets data). These older offset agreements (approximately 250), included requirements for practically all offset transactions for Finland, the second largest recipient country; 60 percent of offset transactions for South Korea; more than 80 percent of offset transactions for Italy; and smaller amounts for many other countries.

The values of offset transactions by type are reflected in Table 5-1.

[15] The 4,425 reported transactions included 31 with negative actual and credit values. The total actual and credit values for negative transactions was $64.9 million. An additional 36 transactions were reported with $0 actual values, but had positive credit values that totaled $211.3 million. This value was just under six percent of all additional credit of $3,546.8 million. These were submitted and treated as normal transactions.

Table 5-1: **Offset Transactions Analysis**			
Offset Transaction Comparisons		Transactions Addressing Offset Agreements Entered into….	
Data Element	All Transactions	Pre-1993	1993 and After
Total Value	$17,993,496,125	$9,118,144,951	$8,875,351,174
Direct Offsets	$7,107,805,750	$3,375,693,397	$3,732,112,353
Indirect Offsets	$10,253,659,363	$5,522,641,373	$4,731,017,991
Unspecified Offsets	$632,031,013	$219,810,182	$412,220,831
% Element	Percent Distributions		
% Direct Offsets	39.50%	37.02%	42.05%
% Indirect Offsets	56.99%	60.57%	53.31%
% Unspecified Offsets	3.51%	2.41%	4.64%

Source: BIS Offsets Database

The data show that seven countries were the recipients of approximately two-thirds (66.8 percent) of the actual value of all offset transactions. These seven countries had a composite multiplier of 1.103, and each country had at least $800 million in offset transactions during the reporting period. The multipliers for the top seven countries ranged from 1.007 for the United Kingdom to 1.412 for South Korea. The UK and Finland were the two largest recipients of offset transactions, each with totals of more than $3.2 billion during the reporting period. Together, the two countries accounted for 36 percent of total offset transactions during the reporting period. Because of smaller than average multipliers, however, the UK and Finland represented only 31.2 percent of the total credit value of all transactions.

After the UK and Finland, individual country offset transaction totals diminish rapidly. For example, Israel was a distant third in total value with only 8.5 percent of the offset transactions, followed by Switzerland with 6.4 percent, and the Netherlands with 5.4 percent. All other countries each accounted for shares of less than five percent of the total value of offset transactions. Sixteen of these countries had shares of less than one percent. The top seven countries receiving offset transactions with their multipliers are shown in Table 5-2.

Table 5-2: **Offset Transactions by Leading Countries** (Total, 1993-2000)			
Country	Actual Value	Credit Value	Multipliers
1. United Kingdom	$3,256,484,855	$3,278,539,063	1.007
2. Finland	$3,216,337,843	$3,446,007,399	1.071
3. Israel	$1,533,386,656	$1,590,743,094	1.037
4. Switzerland	$1,148,627,066	$1,157,282,447	1.008
5. Netherlands	$1,089,903,849	$1,394,722,802	1.280
6. South Korea	$973,467,169	$1,374,337,556	1.412
7. Spain	$801,702,880	$1,020,824,250	1.273
Total	$12,019,910,318	$13,262,456,611	1.103
Percent of All	66.80%	61.57%	
All Countries (35)	$17,993,496,125	$21,540,271,239	1.197

Source: BIS Offsets Database

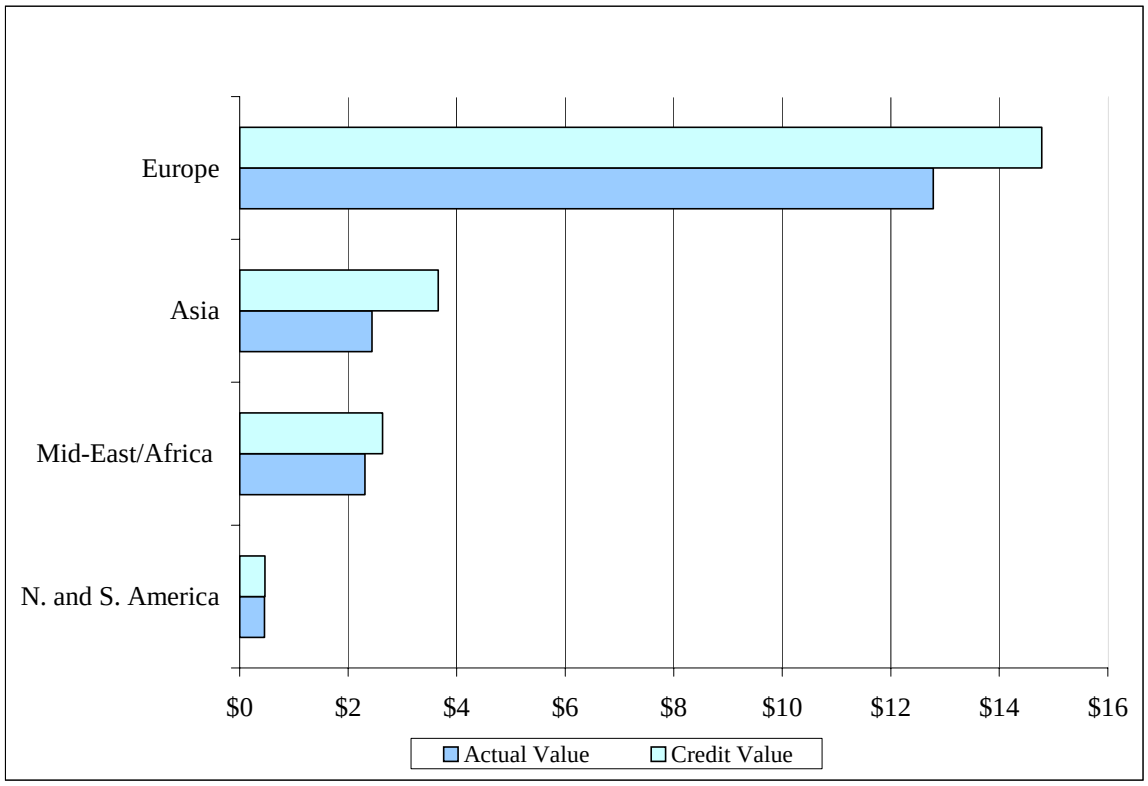
5.2 Regional Distributions

As expected, the regional distribution of offset transactions closely mirrors the pattern of offset agreements. Chart 5-1 presents this pattern graphically. As with offset agreements, European countries dominated the regional distribution of offset transactions. Europe accounted for more than 71 percent of the value of offset transactions during the reporting period. However, with a smaller than average multiplier (1.156), European countries accounted for only 68.6 percent of the total credit value applied toward open offset agreements.

Asian countries ranked a distant second in both categories. Asia accounted for 13.6 percent of the total value of the offset transactions. However Asia, with a larger than average multiplier (1.5), accounted for 17 percent of the total credited value of such transactions.

Middle Eastern and African countries accounted for 12.8 percent of the total offset transactions and 12.2 percent of the credit value. The multiplier for Middle Eastern and African countries was 1.141, slightly lower than Europe's.

Chart 5-1: Regional Totals of Offset Transactions, 1993-2000 (in $ billions)



Source: BIS Offsets Database

North and South American countries were a distant fourth with only about 2.6 percent transaction shares and 2.2 percent of the credit. The multiplier for North and South America was the lowest of the four regions at only 1.013. Chart 5-1 presents this data graphically.

The multipliers for each region directly affect the impact offset agreements have on the U.S. defense industrial base. For the world at large, the offset percentage was 61.3 percent (i.e., the value of offset agreements was 61.3 percent of the total value of the related defense contracts). The multiplier for the world at large was 1.197. Therefore, the adjusted offset percentage – discounting 61.3 percent by the multiplier – is 51.2 percent. The multiplier, therefore, reduces the prime of fulfilling offset agreements.

For the four main regions described above, the multiplier discount reduced Europe's offset percentage from 92.3 percent to 79.8 percent. The offset percentage for Asia, with its high multiplier, dropped from 26.2 percent to 17.5 percent. The Middle East and Africa fell from 44 to 38.6 percent, while North and South America showed little change, dropping from 90.8 to 89.6 percent. Lesser-developed economies usually provide larger

multipliers as an incentive to the prime contractor in an effort to obtain needed technology or production capacity. The calculations and results of this analysis are shown in Table 5-3 below.

Table 5-3: Regional Offset Transactions
(Dollar values in $ millions)

	Offset Transactions			Offset Agreements	
Region	Actual Value	Credit Value	Multiplier	% Offset Agreements	Multiplier Discount
Europe	$12,784	$14,781	1.156	92.3%	79.8%
Asia	$2,441	$3,659	1.499	26.2%	17.5%
Mid-East/Africa	$2,310	$2,636	1.141	44.0%	38.6%
N./S. America	$459	$465	1.013	90.8%	89.6%
Total	$17,993	$21,540	1.197	61.3%	51.2%

Source: BIS Offsets Database

5.3 Offset Transactions by Type

For the eight-year reporting period, direct offsets accounted for 39.5 percent ($7.1 billion) of the total value of offset transactions. Indirect offsets accounted for 57 percent ($10.3 billion) of the value of offset transactions. The remaining 3.5 percent ($632 million) consisted of transactions that were not specified as direct or indirect. Direct offsets varied greatly from year to year, based mostly on which countries dominated the offset activity. The same variation held for indirect offsets.

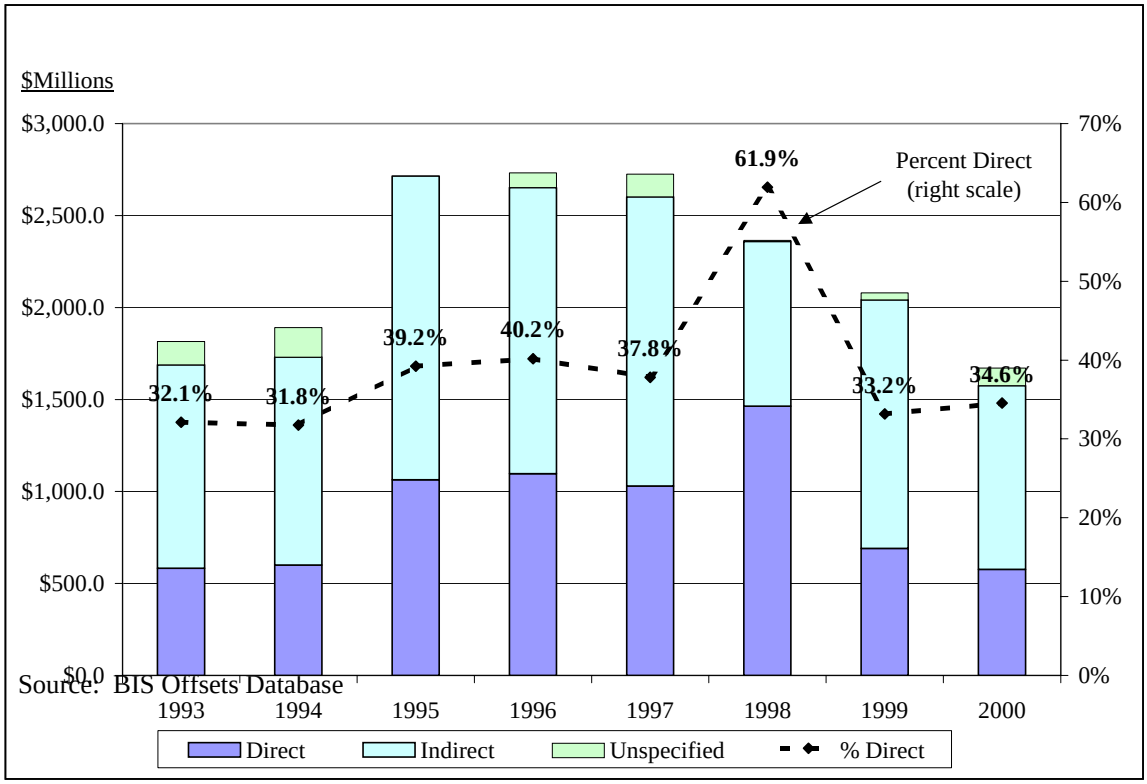
Finland was the major recipient of indirect offsets through most of the reporting period, receiving nearly 27 percent of the total value of indirect offset transactions. (Most of these transactions were related to a major offset agreement signed before 1993.) Indeed, only 14 percent of Finland's offset transactions were classified as direct offsets. Removing the data on Finland yielded interesting results because Finland was so large an influence and somewhat of an anomaly. Excluding Finland, the share of direct offset transactions accounted for by agreements entered into before 1993 increased to nearly 50 percent of the residual total. This would indicate that direct offsets were a bigger factor before the shrinkage in defense spending began in the past decade.

By the same token, the UK led all countries in direct offset received during the reporting period, and these were almost exclusively related to aerospace contracts. A quick comparison between the UK and Finland leads one to conclude that Finland lacks the indigenous aerospace infrastructure to take full advantage of direct offsets, while the UK

is well positioned to do so. Finland could use direct offsets to help build an aerospace infrastructure; however, it appears that Finland has other priorities.

Calculated on an annual basis, the value of direct offsets ranged from $1.46 billion (in 1998) to $578 million (in 2000). Direct offset transactions averaged $888 million yearly for the eight-year reporting period. The value of indirect offset transactions ranged from $895 million (1998) to $1.65 billion (1995), averaging $1.28 billion per year during the reporting period. Direct offset transactions were at their lowest levels in 1993 and 1994 relative to indirect offset transaction, accounting for just over 30 percent of total offset transactions in those years. This was before the UK received a substantial value of direct offset transactions in 1995, which increased to almost $650 million by 1997, before tapering off. A large value of direct offset transactions ($280 million) also was reported for Israel in 1995, raising the overall percentage of direct offsets to 39.2 percent that year. In 1998, the percentage distribution of direct offsets peaked at an unusually high 61.9 percent. In addition, exceptionally high direct offset transactions were reported in Italy, Israel, and the Netherlands in 1998, while the UK subsided from the prior year with direct offsets of $350 million. These year-to-year variations in the distribution of direct and indirect offset transactions are presented in Chart 5-2 below.

Chart 5-2: Direct, Indirect, and Unspecified Offset Transactions, 1993-2000 (in $ millions)



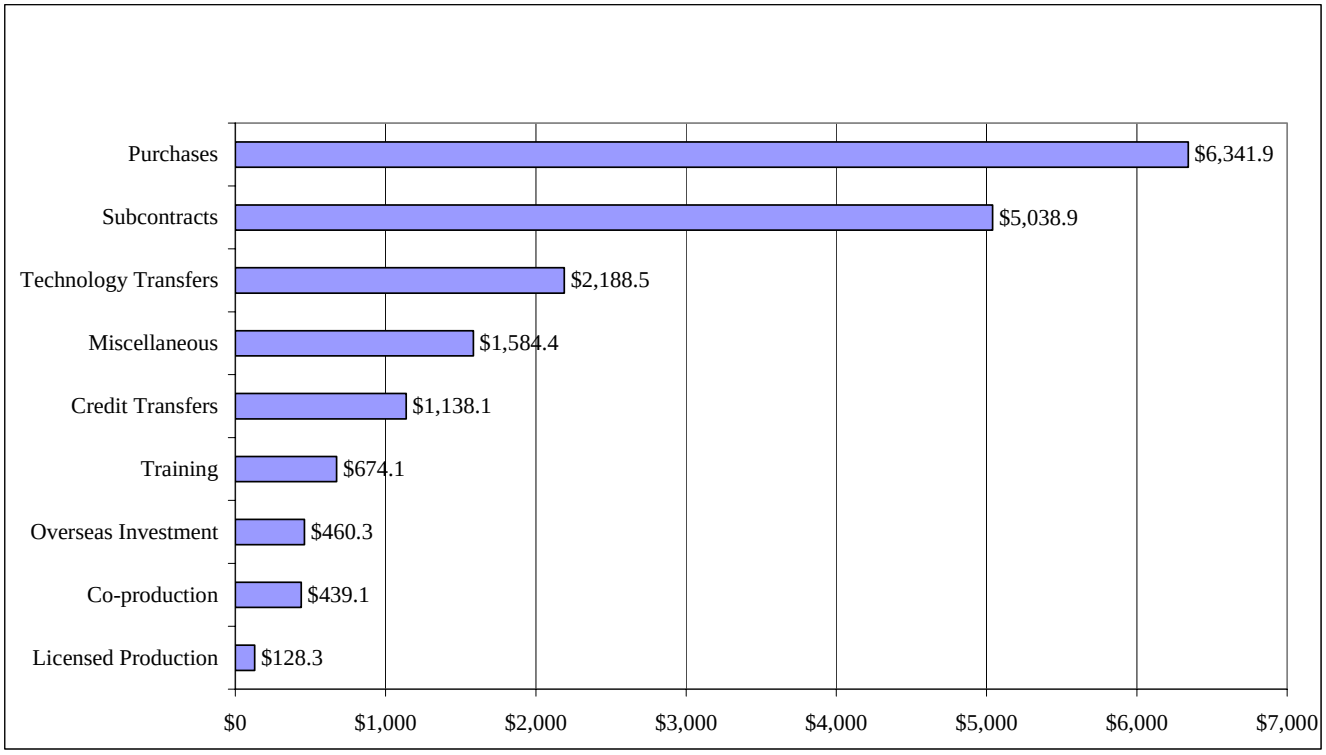
Source: BIS Offsets Database

5.4 Offset Transactions by Category

Three categories of offset transactions dominated offset activity during the reporting period: Purchases, Subcontracts, and Technology Transfers. These three categories accounted for 75.4 percent of the value of all offset transactions during the eight-year reporting period. Purchases (35.2 percent) and Subcontracts (28 percent) alone accounted for almost two-thirds of the value of total offset transactions. Technology Transfers made up an additional 12.2 percent. Most of the remaining 25 percent of offset transactions were categorized as Miscellaneous (8.8 percent) and Credit Transfer (6.3 percent). The remaining 9.5 percent of the value of offset transactions were distributed among the other four categories: Training, Overseas Investment, Co-production, and Licensed Production. Chart 5-3 below shows the distribution of offset transactions by category.

All 35 countries involved in offset activity were recipients of offset transactions categorized as Purchases, which were classified as either indirect or unspecified offsets. These purchases were comprised mostly of manufactured goods and services, including metal castings and forgings, aircraft parts, night vision components, machined parts,

Chart 5-3: Offset Transactions by Category, 1993-2000 (in $ millions)

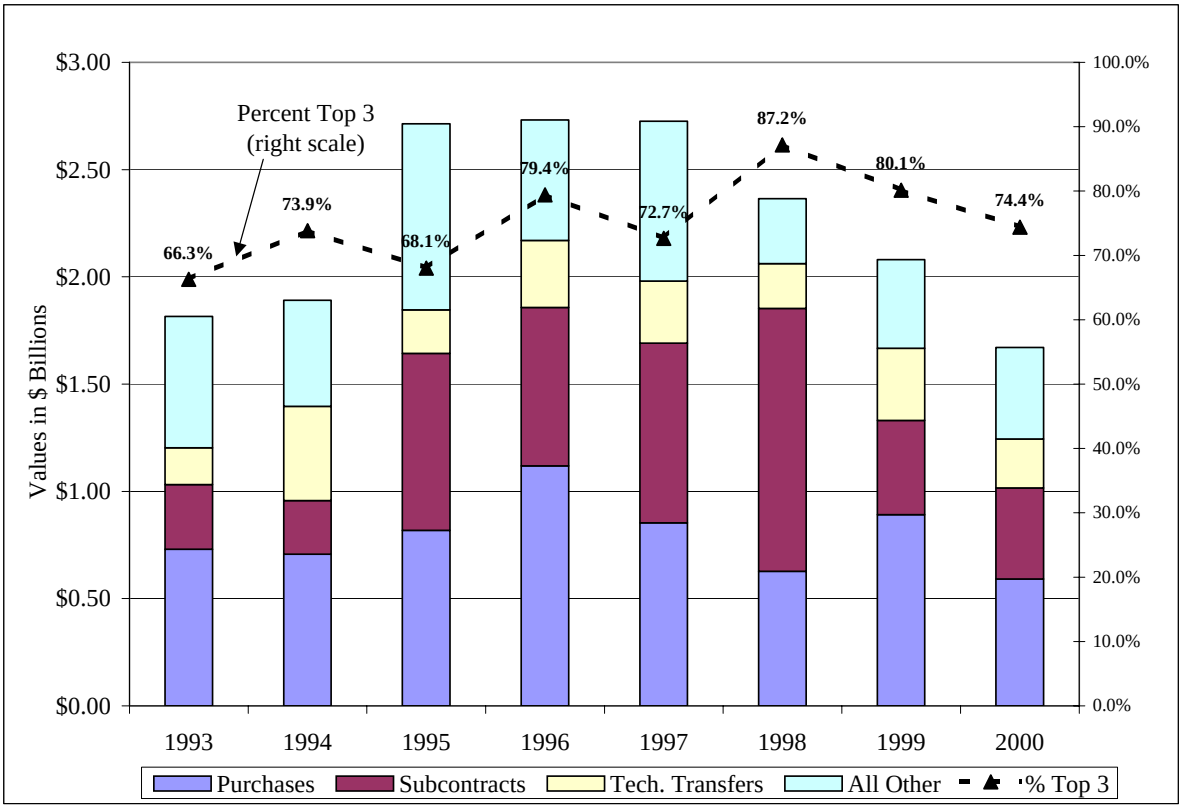


Source: BIS Offsets Database

electronic components, software, and educational and consulting services. The countries with the most purchases were the United Kingdom (accounting for 19 percent of the value of all purchases), Finland (14 percent), and Switzerland (11 percent). About 47 percent of all offset transactions categorized as Purchases were aerospace-related, many of which were used directly by U.S. exporters to supply items for other unrelated defense systems or elsewhere in their logistics network.

Twenty-seven countries were recipients of offset transactions classified as Subcontracts. The overwhelming majority of subcontracts involved aerospace-related manufactured parts, components, and services. Aerospace-related transactions accounted for 94.2 percent of the total value of all offset transactions categorized as Subcontracts, twice the percentage of such transactions in the Purchase category. The UK alone accounted for one-third of all subcontracts, while Israel – a distant second – accounted for 16 percent. Italy accounted for 9.3 percent of all subcontracts, and the Netherlands accounted for 7.5 percent. Combined, these four countries accounted for two-thirds of the value of all

Chart 5-4: Percentage of Total Annual Offset Transactions Accounted for by Top Three Transaction Categories, 1993-2000



Source: BIS Offsets Database

offset transactions categorized as Subcontracts. Incidentally, Finland accounted for only 2.3 percent of the value of all offset transactions categorized as Subcontracts, despite being a close second in the overall offset transactions with $3.2 billion in transactions during the reporting period.

Data showing the percentage of total offset transactions accounted for by Purchases, Subcontracts, and Technology Transfers are shown in chart 5-4 below. The dominance of these three categories ranged from 66.3 percent of all offset transactions (by value) in 1993 to 87.2 percent in 1998.

Some 23 countries accounted for all technology transfers. Finland accounted for nearly 30 percent, while South Korea (15 percent) and Spain (13 percent) rounded out the top three. Others with significant shares included Taiwan (8 percent), Australia (7.4 percent), and Switzerland (5.7 percent).

5.5 Offset Transactions by Category and Type

Analyzing the distribution of offset transactions by category and by type provides further insight into the effects of offsets on the U.S. defense industrial base. For example, Subcontracts, Co-production, and Licensed Production accounted for 77.5 percent of the value of all direct offset transactions, and each of these categories resulted in foreign production of goods or services. As a result of such offsets, U.S. suppliers can be dislodged from participation in the manufacture and/or assembly of U.S. defense systems and – even more importantly – from future maintenance requirements, which can often be more lucrative than the initial sale. Offset transactions in these three categories totaled $5.5 billion during the eight-year reporting period, with Subcontracts by far the largest portion ($5 billion).

Indirect offsets that involved foreign production of goods and services included Purchases and a small amount of Licensed Production. Together, the value of these two categories totaled nearly $6 billion during the period and accounted for 58.4 percent of the value of all offsets classified as indirect. In total, during the reporting period, $11.5 billion in overseas production – or an average of more than $1.4 billion per year – was the result of either direct or indirect offset transactions.

Technology Transfers, Training, Credit Assistance, and Overseas Investment offsets also can enhance the capabilities of foreign producers and make them more competitive in the global market. These categories of offset transactions can be either direct or indirect. Aside from the monetary value, the effects of such transactions can be long-term and overflow into other defense systems in the United States and other countries to the extent that they make foreign manufacturers more competitive. The value of direct offset transactions in these four categories was $1.35 billion during the reporting period, 65 percent of which were accounted for by Technology Transfer. The four categories accounted for approximately 19 percent of the value of all direct offset transactions. The value of indirect offset transactions in these four categories during the reporting period was $2.95 billion, most of which was accounted for by Technology Transfer (41.5 percent) and Credit Assistance (38.5 percent). In total, during the reporting period, $4.29 billion in offset transaction was accounted for by direct and indirect transactions in these four categories. The annual average was $537 million.

Charts 5-5 and 5-6 show the distribution of offset categories for direct and indirect offset transactions.

Chart 5-5: Direct Offset Transactions by Category, 1993-2000

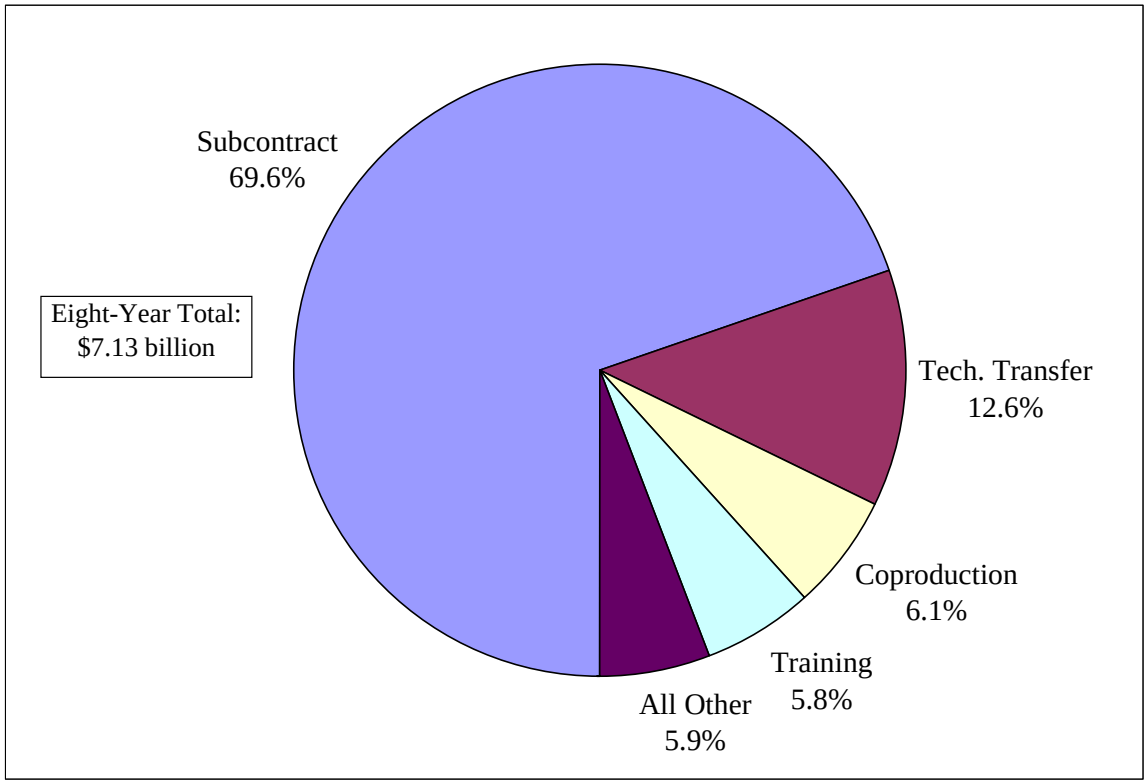
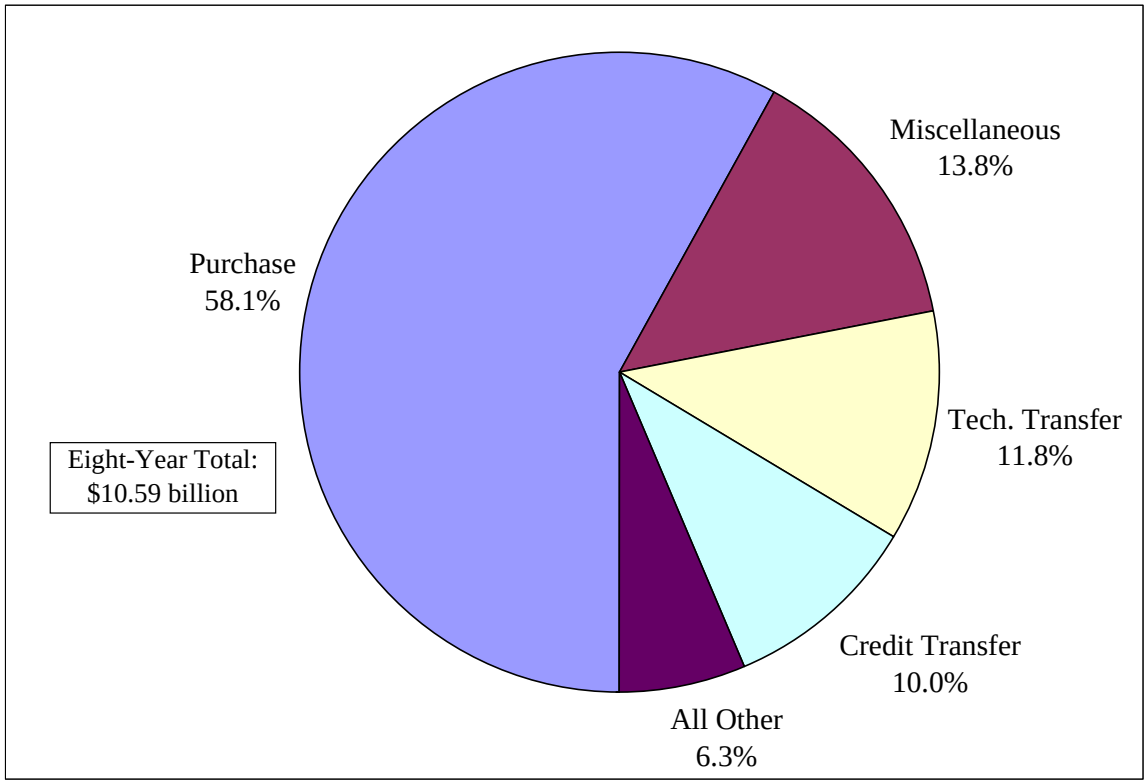


Chart 5-6: Indirect Offset Transactions by Category, 1993-2000



Charts' Source: BIS Offsets Database

5.6 Offsets by Recipients

A total of 1,602 foreign entities received offset transactions during the reporting period. The average recipient was awarded the equivalent of 2.76 offset transactions with a total value of $11.2 million. However, the median value received was only $2.44 million, which is more representative of the situation for most recipients. The average offset transaction during the reporting period was valued at slightly more than $4 million ($1.13 million median).

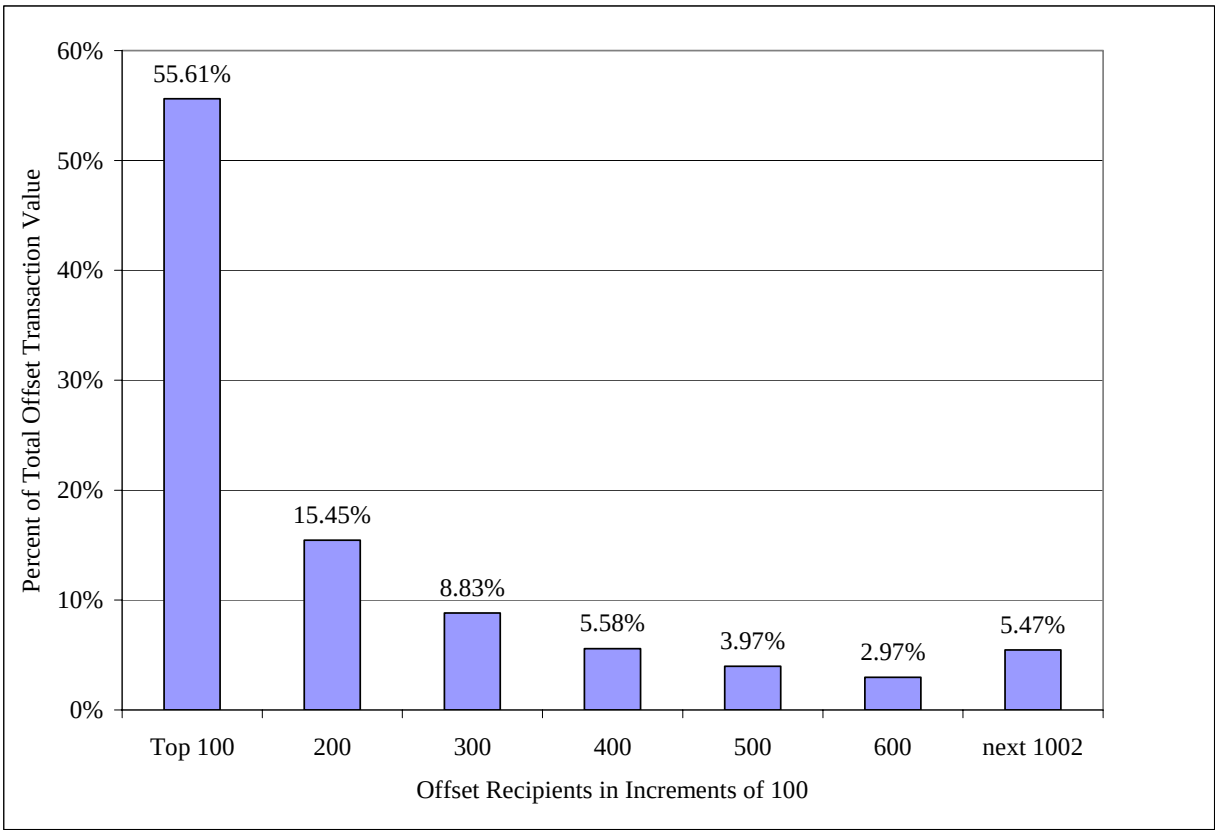
More than half of offset recipients participated in only one offset transaction. These 871 offset recipients averaged about $3.89 million per transaction for a total value of $3.39 billion (or 18.8 percent) of all offset transactions during the reporting period. Five large transactions – all more than $50 million and one valued at more than $180 million – influenced the high average. These five transactions were not representative of the whole; if they are excluded, the per-transaction average drops to $3.33 million. The median for the one-transaction recipients was $1.09 million, which is less than half the median for all recipients. Direct offsets accounted for only 23.7 percent of the value of offsets received by single-transaction recipients, while aerospace transactions comprised about half their total.

On the other side of the spectrum, 165 recipients participated in at least six offset transactions. These companies accounted for almost half of the total value of offset transactions, 56.9 percent of the value of all direct offsets, and 55.2 percent of the value of all aerospace transactions. Collectively, these 165 recipients were awarded a total of 1,971 transactions valued at $8.8 billion during the reporting period. Of this $8.8 billion, more than 46 percent was comprised of direct offsets and 71 percent was aerospace-related. The average value of an offset transaction per recipient was $53.2 million, the median approximately $32 million. The total offset transaction values for individual recipients ranged from less than $1 million to nearly $500 million. One company was awarded 85 offset transactions for nearly $300 million, although this was distributed among several of the company's divisions.

The value of offset transactions is concentrated heavily in a small number of the 1,602 recipients. The top 100 recipients accounted for 55.6 percent of the total value of offset

transactions.[16] Nearly 80 percent of the value of total offset transactions was awarded to the top 300 recipients and 94.5 percent went to the top 600. Chart 5-8 below shows the distribution of offset transactions among the recipients.

Chart 5-7: Top Offset Transaction Recipients by Share of Total Value, 1993-2000 (in increments of 100 recipients)



Source: BIS Offsets Database

5.7 Offset Transactions by Industrial Sector

Identifying offset transactions by industry sector allows for an even more detailed analysis of the effect of offsets on the U.S. defense industrial base. Offset transactions generally are clustered around a small number of major industries associated with defense production, as shown by the data in Table 5-4. A complete listing of the detailed SIC data BIS was able to establish appears in Appendix D.

[16] Not all recipients in the top 100 received six or more offset transactions. For example, the second highest recipient (by value) was involved only in two transactions. The top 100 recipients actually topped the value of the 165 recipients with more than five transactions as noted above.

Table 5-4: Offset Transactions by Major Industrial Sectors				
SIC	Sector Description	Number of Transactions	Value in $ millions	Percent of Total
37	Transportation Equipment	2,003	$9,015.5	50.1%
36	Electronic/Electrical Equipment	604	$2,326.9	12.9%
35	Industrial Machinery	535	$1,311.1	7.3%
38	Measuring & Analyzing Instrumentation	220	$948.6	5.3%
73	Business Services	236	$904.8	5.0%
87	Technical Services & Consultants	210	$838.2	4.7%
	Sub-Total	3,808	$15,345.0	85.3%
	Total	4,425	$17,993.5	

Source: BIS Offsets Database

Offset transactions related to transportation equipment alone accounted for 50.1 percent of all offset transactions and were composed mostly of aerospace products. During the reporting period, over $9 billion in offset transactions related to transportation equipment accounted for 65 percent of the total value of direct offsets and more than 38 percent of the total value of indirect offsets. In addition, more than 75 percent of transactions not specified by type were in the transportation equipment sector.

The electronic and electrical equipment sector was a distant second to the transportation equipment sector, accounting for only 13 percent of the total value of all offset transactions. This sector includes products such as radar, communications equipment, and electronic components, as well as completed avionics equipment and material inputs for avionics such as circuit boards.[17]

Transactions in the industrial machinery sector accounted for more than seven percent of the value of all offset transactions during the reporting period. Industrial machinery includes capital equipment used in the production of both defense and non-defense items. This includes metal-working machine tools, conveyors, air and gas compressors, textile machinery, mining equipment, off-road vehicles, and welding equipment. Two additional sectors – Business Services (SIC 73) and Technical Services and Consultants (SIC 87) –also were significant. Business services (five percent of total offset transactions) were mostly related to computer software, databases, and other information technology. Technical services (4.7 percent of total offset transactions) included mostly engineering services and consulting, training, and related technical data packages.

[17] The completed avionics arguably could be part of sector SIC 38 – Measuring and Analyzing Instrumentation, but could not be specifically identified as one or the other based on the data provided.

Offset transactions were categorized into a total of 39 industrial sectors, including one labeled undetermined (SIC 99). The 33 sectors not described above accounted for less than 15 percent of the total value of all offset transactions. Only four of these sectors accounted for more than one percent of total offset transactions, while most of the rest were insignificant. The four were Non-Depository Credit Institutions (SIC 61) with 3.1 percent, Fabricated Metal Products (SIC 34) with 2.9 percent, Holding and Investment Offices (SIC 67) with 2.3 percent, and Educational Services (SIC 82) with 2 percent. The true meaning of credit institutions and investment offices was expanded to accommodate the credit assistance and overseas investment categories of offset transactions. These four sectors accounted for an additional 10.3 percent of the total value of offset transactions so that transactions in just 10 industrial sectors accounted for 95.6 percent of the value of all offset transactions.

Among the remaining 29 sectors, only Primary Metal Industries (SIC 33) and Chemicals and Allied Products (SIC 28) were of significance. The total value for Primary Metal Industries was $156 million and Chemicals and Allied Products was $119 million. Both sectors were comprised almost exclusively of indirect offsets. No other sector had more than $70 million in total offset transactions during the reporting period. The total value for the remaining 29 sectors was $804 million, and Primary Metal Industries (SIC 33) and Chemicals and Allied Products (SIC 28) represented over one-third of this total.

Manufacturing sectors ($14.5 billion) were by far the dominant offset choice, representing 80.6 percent of all offset transactions. Services ($3.3 billion) accounted for most of the remainder at 18.4 percent. One percent was comprised of a combination of agricultural products ($42 million), mining ($15 million), and construction activities ($48 million); another $77 million was undetermined.

Indirect offsets were more widely distributed among industry sectors than direct offsets. Indirect offset transactions occurred in all 39 sectors (and represented 100 percent of the offset transactions in 17 sectors and more than 90 percent in seven more). Most of these indirect offsets were not significant in dollar value. Direct offset transactions occurred in 22 sectors, but only accounted for more than 10 percent of the total value offsets in 14 sectors. Unspecified offsets appeared in just eight sectors, and represented over 10 percent in only two.

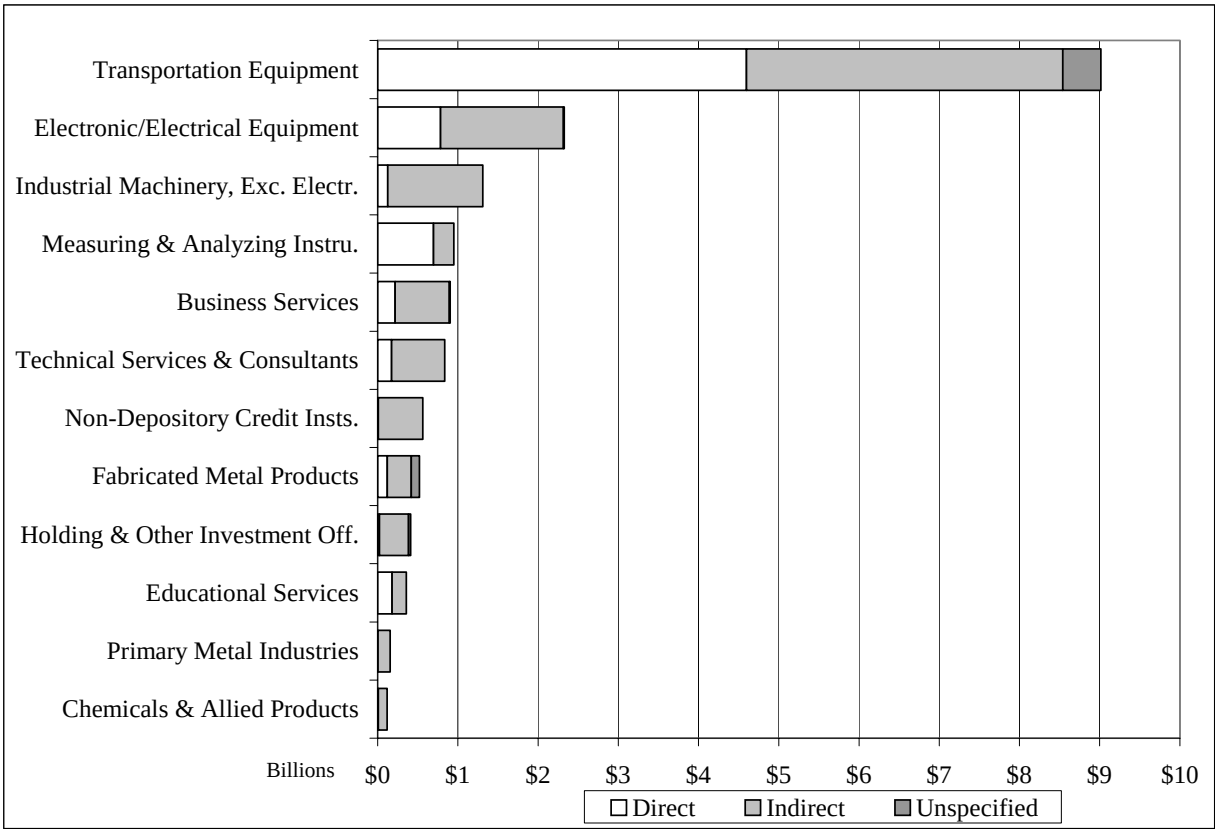
In terms of dollar value, the top 12 industrial sectors accounted for more than 97 percent of the total value of all offset transactions during the reporting period. Based on offset type distribution, these 12 sectors accounted for 97.7 percent of all direct offsets, 96.5

percent of indirect offsets, and virtually all of the unspecified offsets. The transportation equipment sector, with over half the total, was the leading sector for each type. Direct offsets were 51 percent of the sector's total. Indirect offsets accounted for another 44 percent.

Two additional sectors that comprised significant quantities of direct offsets were the electrical equipment sector and the measuring and analyzing instrumentation sector. Along with the transportation equipment sector, these sectors accounted for 85.5 percent of all direct offsets. The same three sectors accounted for 55.8 percent of indirect offsets, which shows a noticeable correlation. Expanding this analysis to eight sectors, 97.1 percent of all direct offsets, 85 percent of all indirect offsets, and 95.5 percent of unspecified offsets were captured. This is clear evidence that offsets are predominantly defense/aerospace regardless of their type.

Chart 5-8 shows the relative shares of offsets by type for the 12 leading industrial sectors.

Chart 5-8: Offset Transactions by Industry and Type for Top 12 Sectors, 1993-2000 (in $ billions)



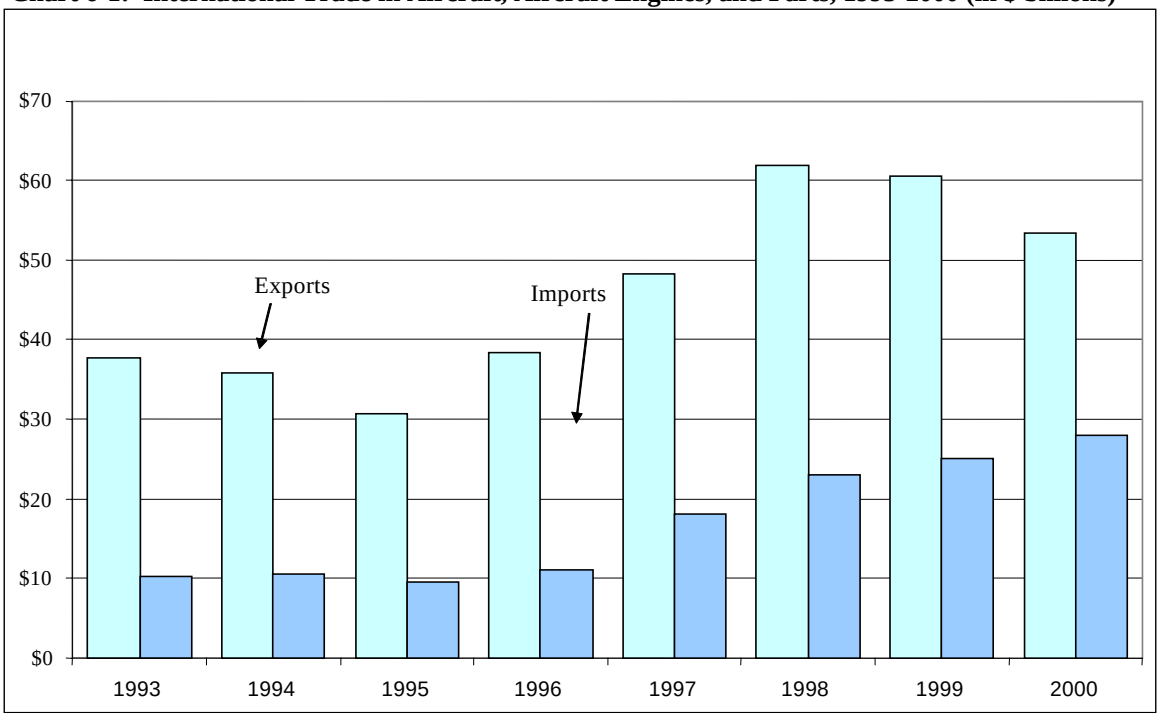
Source: BIS Offsets Database

6. Aerospace Offset Issues

Offsets affect the U.S. aerospace industry more than any other major economic sector. These offsets have been documented in detail in previous offset reports.[18] Since aerospace-related exports made up the majority of export sales and related offset agreements reported, the impact of offsets on the aerospace industry is a good indicator of the effect of offsets on the industrial competitiveness and trade of the United States as a whole.

Imports of aerospace products into the United States have increased rapidly in the last decade for a variety of reasons, one of which is the increase in aerospace-related offsets. Aerospace-related imports have increased in both strong and weak economies and despite the fact that the United States spends more on defense and commercial aerospace research and development than any other nation. As shown in Chart 6-1, aerospace imports

Chart 6-1: International Trade in Aircraft, Aircraft Engines, and Parts, 1993-2000 (in $ billions)



Source: Aerospace Industries Association, *Aerospace Facts and Figures*, various issues

[18] See e.g., U.S. Department of Commerce Report, *Offsets in Defense Trade*, October 1999, pages 35-55.

increased from $12.2 billion in 1993 to $28 billion – an all time high – in 2000. Aerospace exports dropped from an all time high of $64.1 billion in 1998 to $54.7 billion in 2000.

The U.S. aerospace trade surplus reached an all time high of $40 billion in 1998, but then declined to approximately $27 billion in 2000. In the same two-year cycle, aerospace imports grew by nearly 21 percent.[19]

6.1 Importance of Export Markets

To highlight the importance of the export market for U.S. aerospace companies, more than half of the unit sales of newly built military aircraft were exported during the eight-year reporting period of 1993 to 2000. Table 6-1 below compares aircraft acquired by the U.S. Department of Defense for use by the armed services with military aircraft exports. During the eight year reporting period, Defense Department acquisitions exceeded exports in only one year – 1994. In 1997, military aircraft exports were more than double U.S. acquisitions. Overall, during the reporting period, military exports were nearly 57 percent of total unit sales.

Table 6-1: Importance of Defense Aircraft Exports
(Number of Newly Constructed Aircraft)

	Total Military Aircraft Acquisition		Military Aircraft Exports			Exports as % of Total
Year	Total	U.S. Defense	Total	FMS	Direct	
1993	955	437	518	146	372	54.2%
1994	764	418	346	69	277	45.3%
1995	811	354	457	108	349	56.4%
1996	558	242	316	106	210	56.6%
1997	488	151	337	181	156	69.1%
1998	418	149	269	175	94	64.4%
1999	359	133	226	114	112	63.0%
2000	333	138	195	42	153	58.6%
Totals	4,686	2,022	2,664	941	1,723	56.9%

Note: FMS=Foreign Military Sales; Direct=Direct Exports by U.S. Defense Firms
Source: Aerospace Industries Association, *Aerospace Facts and Figures*, various issues

[19] See Aerospace Industries Association publication, *Aerospace Facts & Figures*, 2001/2002 (and prior editions).

6.2 Trends in Aerospace

The aerospace infrastructure is becoming more global. Although the United States continues to maintain its position in first-tier integrator companies, global sourcing at the second and lower tiers is rising rapidly as an acceptable option – more so in the commercial area than in the military. In the last decade, some of the advantages of local sourcing, such as cost reductions in communications and transportation, have faded. In addition, many important aerospace technologies are available worldwide. Many European firms are technically comparable – and some superior to – U.S. firms in the production of various critical components, including gearboxes, ball screws, bearings, fasteners, forgings, investment castings, aluminum, diesel engines, machine tools, ejection seats, and steel. Other important trends in the U.S. aerospace industry are as follows:

- The U.S. aerospace industry – which occupies a major industrial and strategic position in the U.S. economy – is not a growth sector. The constant dollar value of aerospace production actually declined 18 percent relative to the Gross Domestic Product and 14 percent relative to all U.S. manufacturing from 1993 to 2000.

- U.S. prime contractors are becoming more specialized in the research, design, integration, and final assembly of aircraft. More work and responsibility is being shifted to major sub-assemblers, who have their own set of suppliers. The competition among major sub-assemblers, who provide major sub-components such as gas turbine engines, electrical systems, hydraulics, and cockpits, is fierce and leading to more global sourcing outside of the United States.

- U.S. aerospace parts and components suppliers showed virtually no growth in productivity over the last 15 years. This is likely a result of declining sales, under-utilized capacity, antiquated defense procurement processes, and pricing pressures from overseas competitors, as well as pressure from customers.

- Most new aerospace business is outside the United States. For the next 5-10 years, approximately two-thirds of the commercial aerospace market is forecast to be outside the United States. This will almost certainly lead to greater foreign sourcing and will pressure lower-tier U.S. suppliers to consider selling internationally.

- Foreign ownership of U.S. aerospace part and component suppliers continues to increase. Foreign ownership usually leads to more imports initially, at least until the foreign owner becomes established in the United States.

6.3 Aerospace Offsets

The following points highlight the effects of offsets on the aerospace industry during the 1993 to 2000 reporting period:

- The U.S. aerospace industry represents the major target of offset activity. Aerospace system export contracts totaled $42.8 billion (89 percent of all exports related to offsets) and accounted for $25.9 billion of the offset agreements (87 percent of the agreement total).

- Transactions involving aerospace products and services totaled (at least) $11.27 billion, or 62.6 percent of the value of all transactions for the eight-year reporting period. (In addition, 10-15 percent of the transactions classified as "unspecified" may also be aerospace items.)

- Approximately 58 percent ($6.53 billion) of the aerospace transactions were classified as direct offset transactions; 37 percent ($4.15 billion) were indirect; and five percent ($586 million) were unspecified. Also, 42 percent ($4.75 billion) of the offset transactions were categorized as Subcontracts; 26 percent ($2.95 billion) as Purchases; and 14 percent ($1.56 billion) as technology transfers. These three categories combined accounted for 82 percent of the total value of aerospace-related offset transactions.

- Aerospace parts trade has expanded rapidly and the U.S. aerospace industry maintains a surplus in parts trade. Imports of parts and components for aircraft and aircraft engines into the United States more than doubled, from $5.8 billion in 1993 to $11.8 billion in 2000. This includes both civilian and military items. Exports of parts and components also grew, from $13.8 to $23.7 billion – an expansion of 72 percent during the reporting period.

- Offsets impacted both military and commercial aerospace markets. Aerospace subcontractor companies normally supply both military and commercial parts.

- Offsets played a significant role in the increase of aircraft and engine parts imports. Military part and component imports rose 82 percent from $2.23 in 1993 to $4.1 billion in 2000. The eight-year total was $25.4 billion. Over the same period, aerospace subcontracts (direct offsets) totaled $4.75 billion (i.e., 18.7 percent of the total military parts imports).

- An additional $2.95 billion of aerospace offsets were purchases (indirect offsets). Adding purchases and subcontracts together, the resulting figure of $7.69 billion represents 10.75 percent of total part and component imports of $71.5 billion (civilian $46.1 billion and military $25.4 billion) for the period.[20]

- Offsets may permanently displace U.S. companies in certain circumstances. It is a fallacy to think of offsets as one-time events that end once an offset agreement is completed. A foreign offset recipient can continue selling product in the United States long after the initial offset transactions are completed. In addition, technology transfers, training, credit assistance, and other offset transactions can bolster the capabilities of foreign vendors and contribute to imports as well, but to an extent that is not yet known. In sum, it appears that the total impact of aerospace offsets is greater than the nominal value of the offsets.

Foreign vendors also can use offsets to gain entry into the U.S. market to supplement markets in their home countries. This expands their sales base and helps them compete, potentially displacing American suppliers in both commercial and military markets.

Defense downsizing increased the average age of military aircraft in the U.S. fleet. This shifted subcontractor work toward replacement and repair parts. Offset agreements associated with the purchase of "off-the-shelf" aircraft provide an opportunity for foreign vendors to supply parts and components (direct offsets) for aircraft destined for the host country, and an additional opportunity to compete in the existing U.S. (and foreign) replacement markets (indirect offsets).

[20] The $2.95 billion in indirect offsets includes military and civilian applications, although the split is not known. If treated as all civilian, the ratio to total civilian imports is still only about 6 percent. This implies that the majority of civilian imports are manufactured by competitive foreign firms, many of whom may have benefited from offsets in the past.

7. Other U.S. Government Offset Activities

The Department of Commerce, through the Bureau of Industry and Security, has participated in a Department of Defense-led Interagency Offsets Steering Committee (the Committee), which includes representatives from the Departments of Defense, State, and Labor, and the Office of the U.S. Trade Representative. Since the publication of the sixth report on *Offsets in Defense Trade* in February 2003, the Committee has been inactive.

In prior years, the Committee has pursued consultations with foreign governments on both a multilateral and bilateral basis, in an attempt to reduce the impact of offsets in defense trade. The Committee took steps to address the issue of offsets with the United States' European allies, our largest defense trade partners who tend to demand the highest levels of offsets. The Committee met with representatives of the British, Canadian, Dutch, French, and Spanish governments, both to gain their perspective on offsets and to discuss the cost to governments of requiring and administering offset programs and the impact on small- and medium-sized businesses.

8. Conclusions

The defense world changed in the 1990s, reflecting both retrenchment of military expenditures and tougher offset policies and enforcement by governments worldwide. Offsets have risen to a more prominent status in determining competitions and ultimately access to foreign markets. Offset agreements exceeding 100 percent are occurring with increasing frequency and, in one case, exceeded 300 percent. From the U.S. perspective, Europe is clearly the central focus of offset activity, dominating both offset agreements and offset transactions with U.S. companies. Because 90 percent of offset agreements are aerospace-related, concerns about U.S. prime contractors and the aerospace infrastructure have increased.

BIS estimates that during the period, offsets maintained an average of 41,666 jobs per year in defense system exporting industries but cost 9,688 jobs per year in the lower-tier supplier base. Based on these conservative calculations, offset agreements and transactions had a net positive effect on employment.

The U.S. aerospace trade surplus fell from its all time high of $40 billion in 1998 to about $27 billion in 2000. Imports of aerospace products have increased rapidly in the last decade for a number of reasons, including offsets. Aerospace-related imports have increased in both up and down market cycles – despite the fact that the United States spends more on aerospace research and development than any other nation – a factor that should make U.S. products very competitive in world markets.

In this report, Commerce has not identified any specific recommendations for remedial action concerning offsets in defense trade. No other government agency has offered alternative findings and recommendations. However, in the coming year, using authorities granted under the DPA, Commerce is committed to work with U.S. industry, the Department of Defense and other agencies, and foreign governments to analyze the impact of offsets on all parties and to seek ways to mitigate their effect on competition. Our goal is to support the U.S. defense industry and to ensure a robust and vibrant industrial base.