

---

---

# Offsets in Defense Trade

## Prepared by the U.S. Department of Commerce

[The following material is extracted from the eighth annual report, July 2004, on offsets in defense trade and is prepared pursuant to Section 309 of the *Defense Production Act of 1950*<sup>1</sup> (DPA), as amended. This report covers offset agreements and offset transactions entered into from 1993 through 2002. Some of the footnotes and tables have been omitted from this excerpt; however, the footnotes and table numbers remain the same as in the original document. The complete report is available at the following website: <http://www.bax.doc.gov/DefenseIndustrialBasePrograms/OSIES/offsets/8thOffsetsReport.htm>.]

### Executive Summary

This is the eighth annual report on the impact of offsets in defense trade prepared pursuant to Section 309 of the Defense Production Act of 1950,<sup>1</sup> as amended (DPA). The Department of Commerce's Bureau of Industry and Security (BIS)<sup>2</sup> has been delegated responsibility for preparing the reports required under Section 309. The report analyzes the impact of offsets on the defense preparedness, industrial competitiveness, employment, and trade of the United States. To assess the impact of offsets in defense trade, the Department of Commerce obtained data from U.S. defense firms involved in defense exports and related offsets and supplemented this information with statistics from the Bureau of the Census and the National Science Foundation.

Total offset activity can be measured by the number and value of new offset agreements entered into between U.S. defense contractors and foreign governments.

### Offset Activity

Total offset activity can be measured by the number and value of new offset agreements entered into between U.S. defense contractors and foreign governments.

Offset Agreements, 2001-2002. U.S. defense contractors reported entering into 35 new offset agreements with fourteen countries in 2001 and forty-one new offset agreements with seventeen countries in 2002. For 2001, new U.S. offset-related defense export contract values totaled \$7.0 billion. New offset agreements attached to these exports had a total value of \$5.5 billion, equaling a 78.1 percent offset requirement. For 2002, new U.S. offset-related defense export contract values climbed to \$7.4 billion, with new offset agreements attached to these exports having a total value of \$6.1 billion, or an 82.3 percent offset requirement.

European nations received offsets equal to 95.8 percent of the total export values in 2001 and 94.3 percent in 2002, down from 111.1 percent in 2000. For non-European nations, though, the average offset requirement was 55.1 percent in 2001 and 77.3 percent in 2002, up significantly from 50.0 percent in 2000.

Offset Agreements, 1993-2002: U.S. companies reported entering into 434 offset agreements with thirty-six countries during the time period from 1993 to 2002. U.S. companies reported export sales of 181 different defense systems or subsystems with a total value of \$63.6 billion. Offset agreements related to those export contracts were valued at \$41.8 billion, or 65.7 percent of the export contract value. Sales of aerospace defense systems i.e., aircraft, engines, and missiles were valued at \$53.6 billion and accounted for nearly 82 percent of the total export contracts.

---

<sup>1</sup> Codified at 50 U.S.C. app. Section 2099 (2000).

<sup>2</sup> On April 18, 2002, the Bureau of Export Administration changed its name to the Bureau of Industry and Security

---

Over the ten-year period, European countries alone accounted for nearly two-thirds 65 percent of the value of offset agreements but less than half 46 percent of the value of related export contracts. European offset demands continued to increase over the ten year period, although more slowly than the demands from other countries. Between 1993 and 2002, European offset demands as a percentage of exports increased by 16 percentage points, going from 78.3 percent to 94.3 percent; for the rest of the world, the increase was almost 55 percentage points, rising from 22.5 percent to 77.3 percent.

Asian countries are capturing an increasing share of offset agreements and export contracts as well as demanding higher offsets. In 2000, Asia accounted for only 2.8 percent of the value of offset agreements; in 2002, Asian countries accounted for 64.8 percent of the total. In contrast, European agreements secured 78 percent of the total value of offset agreements in 2000, but only 34 percent of agreements in 2002. Furthermore, Asian offset requirements reached 52.3 percent in 2001, and grew to 78.4 percent in 2002. The region's 1993-2000 average offset requirement was only 26.2 percent. The data indicate that the level of the demands from non-European nations as a group is rising as well. For 1993-2000, the average offset requirement for non-European countries totaled only 33.9 percent; for 1993-2002, the average requirement rose to 42.4 percent.

In a country-by-country analysis, Austria led Europe and the rest of the world in terms of its offset requirement percentage. On average, sales of U.S. weapons systems to Austria were associated with offset agreements worth 174.2 percent of the value of the weapon systems. Other countries with offset percentages greater than the value of the weapon systems exported were the Netherlands (120.5 percent), South Africa (116.7 percent), Greece (110.5 percent), and Sweden (103.9 percent).

### **Transactions**

Offset activity can also be measured by the number and value of individual offset transactions carried out in fulfillment of offset agreements during the reporting period.

#### **Offset Transactions, 2001-2002**

U.S. companies reported offset transactions with a total actual value of \$2.6 billion in both 2001 and 2002. The 2001 figure represents a 53 percent increase from the 2000 total of \$1.7 billion, but is only slightly higher than the average annual value of offset transactions \$2.3 billion during the ten-year period from 1993 to 2002. The percentage of the value of offset transactions classified as indirect rose during 2001 and 2002, reaching 63.8 percent in 2002, compared with 35.9 percent of the value in direct transactions that year. The remaining 0.3 percent of the value was unspecified.

#### **Offset Transactions, 1993-2002**

For 1993-2002, U.S. companies reported 5,903 offset transactions executed in 35 countries. These offset transactions were related to 230 defense systems under existing offset agreements. The actual value of the offset transactions from 1993 to 2002 was \$23.5 billion. Indirect offsets accounted for 58.2 percent of the total value of transactions and direct offsets made up 39.1 percent. The remaining 2.7 percent of the value was unspecified.

The multiplier for all transactions during 2001-2002 was 1.265; this means that purchasing countries granted, on average, \$1.265 of offset credit for each \$1 in actual offset transaction value for those two years. For 1993-2002, the total multiplier was 1.224.

### **Findings**

The Asian share of total export contracts and the region's level of offset demands have experienced dramatic growth in recent years. Individual countries in other non-European regions

---

of the world are also demanding and receiving increased levels of offsets; non-European reached 77 percent of the value of the sales. At the same time, increases in Western European offset demands are moderating, with requirements in 2001 and 2002 remaining around 95 percent of the value of the agreement, but still well above other regions of the world.

By combining BIS offsets data with aerospace industry data from the Census Bureau's 2001 *Annual Survey of Manufactures* (ASM), the most recent data published, the impact on defense productive capacity can be estimated. According to comparable BIS data for 2001, U.S. defense exports with offset agreements attached totaled \$7.0 billion. Using ASM information on value added per aerospace worker, BIS estimates that (assuming 100 percent export content) these exports sustained 42,440 work-years in 2001. In 2001, subcontracting, purchasing, co-production, and licensing transactions (those most likely to shift sales from U.S. suppliers to overseas firms) were valued at \$1.9 billion. Dividing \$1.9 billion by \$165,858 (the value added by each worker in the aerospace industry in 2001) results in the loss of approximately 11,460 work-years in 2001. Based on these calculations, it appears that defense export sales had a net positive effect on employment in the defense sector during the period from 1993 to 2001, although the net positive effect was diminished by the offset agreements. This calculation assumes that industry would not have received these defense export contracts if it had not entered into the related offset agreements. It should also be noted that the above analysis does not include an additional \$9 billion of offsets in technology transfer, training, overseas investment, and marketing transactions, because the impact of these transactions on the U.S. defense industrial base is difficult to calculate. Nor does this calculation include consideration of the long-term effect of creating new or enhanced competitors.

### **Legislation and Regulations**

In 1984, the Congress enacted amendments to the DPA, which included the addition of Section 309 addressing offsets in defense trade.<sup>3</sup> Section 309<sup>4</sup> required the President to submit an annual report on the impact of offsets on the U.S. defense industrial base.

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.<sup>5</sup>

Under Section 309, the Secretary of Commerce is authorized to develop and administer the regulations necessary to collect offset data from U.S. defense exporters. The Secretary of Commerce delegated this authority to the Bureau of Industry and Security, which published its first offset regulations in the Federal Register in 1994.<sup>6</sup>

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

---

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

4. Section 309 of the DPA was amended in 2001 to reflect the change in the name of the House committee to the "Committee on Financial Services of the House of Representatives." See 50 U.S.C. app. Section 2099(a)(1).

5 See Pub. L. 102-588, 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 Federal Regulation 61796, Dec. 2, 1994, codified at 15 C.F.R. Section 701.

---

---

offset credits of \$250,000 or more. Every year, U.S. companies report offset agreement and transaction data for the previous calendar year to BIS.

### **U.S. Government Policy**

The U.S. government policy on offsets in defense trade was developed by an interagency offset team. On April 16, 1990, the President announced a policy on offsets in military exports.<sup>7</sup> In 1992, Congress passed the following provision that reflected the substance of the policy announced by the President:<sup>8</sup>

- 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—

- 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;

- 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;

- 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

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

- After receiving the recommendation of the National Security Council.

- Presidential Approval of Exceptions. It is the policy of the Congress that the President may approve an exception to the policy stated in subsection

- 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.

In 1999, the offset policy was supplemented by provisions contained in the *Defense Offsets Disclosure Act of 1999*.<sup>9</sup> Specifically, Congress made the following findings:

- 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.

- 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.

---

<sup>7</sup> See April 16, 1990 statement by Press Secretary Fitzwater on offsets in military exports.

<sup>8</sup> Congress incorporated this policy statement into law with the *Defense Production Act Amendments of 1992* (Pub. L. 102-558, Title I, part C, Section 123, 106 Stat. 4198).

<sup>9</sup> See Pub. L. Not 106-113, Div. B, Section 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. App. 2099, Note).

---

---

- The use of offsets may lead to increasing dependence on foreign suppliers for the production of United States weapons systems.

- 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.

- Offset demands often unduly distort the prices of defense contracts.

- In some cases, United States contractors are required to provide indirect offsets which can negatively impact nondefense industrial sectors.

- 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.

### **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).

- 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.

- 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 a 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 overseas subsidiary or joint venture, or other activities under direct commercial arrangement between the defense prime contractor and a foreign entity.

### **Statistical Overview**

In this part of the report, we provide a general overview of offset statistics collected by BIS for the years 1993 through 2002, along with a review of some of the terms used by BIS to organize the data for analysis. More detailed sections on agreements and transactions will follow in Chapters 4 and 5.

### **General Overview**

A summary of offset activity for 1993 through 2002 is provided in Table 2-1. Data for 2000 have been revised to reflect corrected information provided by reporting firms.

### **Offset Transaction Types**

Table 2-2 presents offset transaction data by type direct, indirect, or unspecified and the percent distribution for each year from 1993 to 2002. As discussed in Chapter 1, direct offset transactions are those that are directly related to the weapon system that is exported. Indirect transactions are not related to the exported system. A transaction is classified as unspecified when there is not enough information available to determine whether it is direct or indirect. The table also shows the total actual and credit values of the transactions for each year. The credit value is normally more than the actual value assigned to transactions; some foreign governments give greater credit as an incentive for certain kinds of offset transactions. This value varies by country and by the kind of transaction (i.e., purchase, technology transfer, investment). The multiplier, also shown in table 2-2, is the percentage difference between the actual value and the credit value. For the 1993-2002 period, the multiplier is 1.224. This multiplier means that, for the database as a whole, the total credit value of the transactions is 22.4 percent more than the actual value. Offset transaction data are more fully discussed in Chapter 5.

### **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 and type for the ten-year reporting period (1993-2002). Appendix F 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 purchases are of items unrelated to the exported defense system. The U.S. exporter may make the purchase, or it can be accomplished by brokering and marketing assistance that result in purchases by a third party. For 1993-2002, purchases represented 38 percent of the actual value

of all offset transactions, the largest share of all categories. Purchases had a multiplier of 1.110, which is lower than the multiplier associated with any other category for the period.

**Table 2-1 General Summary of Offset Activity, 1993-2002**  
(all \$ in millions)

<b>Offset Agreements</b>						
<b>Year</b>	<b>Export Value</b>	<b>Offset Value</b>	<b>Percent of</b>	<b>Companies</b>	<b>Agreements</b>	<b>Countries</b>
			<b>Percent</b>			
1993	\$13,957.0	\$4,806.7	34.4%	18	30	17
1994	\$4,792.4	\$2,048.7	42.8%	18	49	20
1995	\$7,402.0	\$6,034.1	81.5%	19	45	18
1996	\$2,987.8	\$2,270.7	76.0%	15	50	19
1997	\$5,822.8	\$3,831.8	65.8%	13	57	19
1998	\$3,257.8	\$1,846.6	56.7%	11	44	17
1999	\$4,681.2	\$3,851.4	82.3%	10	45	11
2000	\$6,278.3	\$5,498.1	87.6%	8	38	14
2001	\$7,039.2	\$5,497.3	78.1%	11	35	14
2002	\$7,406.2	\$6,094.8	82.3%	12	41	17
<b>10 Years</b>	<b>\$63,624.9</b>	<b>\$41,780.3</b>	<b>65.7%</b>	<b>39</b>	<b>434</b>	<b>36</b>

<b>Offset Transactions</b>						
<b>Year</b>	<b>Actual Value</b>	<b>Credit Value</b>	<b>Multiplier</b>	<b>Companies</b>	<b>Transactions</b>	<b>Countries</b>
1993	\$1,815.1	\$2,162.1	1.191	24	440	27
1994	\$1,891.1	\$2,161.5	1.143	21	550	26
1995	\$2,713.7	\$3,390.8	1.250	20	670	27
1996	\$2,731.5	\$3,098.9	1.135	21	623	26
1997	\$2,725.5	\$3,276.2	1.202	18	577	26
1998	\$2,364.8	\$2,684.6	1.135	19	582	30
1999	\$2,080.4	\$2,824.1	1.358	13	512	25
2000	\$1,998.5	\$2,613.0	1.307	14	601	23
2001	\$2,588.1	\$3,295.7	1.273	15	620	25
2002	\$2,613.0	\$3,281.5	1.256	17	728	27
<b>10 Years</b>	<b>\$23,521.5</b>	<b>\$28,788.4</b>	<b>1.224</b>	<b>42</b>	<b>5903</b>	<b>39</b>

**Source:** BIS Offsets Database

**Note:** Due to rounding, totals may not add up precisely. Also, data for 2000 have been revised to reflect corrected information provided by reporting firms.

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. During 1993-2002, subcontracts represented 28.5 percent of the actual value of all offset transactions, and 72.9 percent of the value of all direct offsets. At 1.124, subcontracts had the second lowest multiplier of all transaction categories.

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 that term is 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

**Table 2-2 Offset Transactions by Type, 1993-2002**  
(Dollar Amounts in Millions)

<u>Year</u>	<u>Total</u>	<u>Direct</u>	<u>Indirect</u>	<u>Unspecified</u>	<u>Direct</u>	<u>Indirect</u>	<u>Unspecified</u>
			<u>Actual Value</u>		<u>Percent of Distribution</u>		
1993	\$1,815.1	\$583.0	\$1,106.0	\$126.1	32.1%	60.9%	7.0%
1994	\$1,891.1	\$600.7	\$1,129.5	\$160.9	31.8%	59.7%	8.5%
1995	\$2,713.7	\$1,064.1	\$1,649.6	NR	39.2%	60.8%	NR
1996	\$2,731.5	\$1,097.5	\$1,553.8	\$80.1	40.2%	56.9%	2.9%
1997	\$2,725.5	\$1,030.3	\$1,570.7	\$124.4	37.8%	57.6%	4.6%
1998	\$2,364.8	\$1,464.2	\$895.3	\$5.4	61.9%	37.9%	0.2%
1999	\$2,080.4	\$690.2	\$1,351.0	\$39.1	33.2%	64.9%	1.9%
2000	\$1,998.5	\$779.9	\$1,122.5	\$96.1	39.0%	56.2%	4.8%
2001	\$2,588.1	\$949.1	\$1,638.2	\$0.8	36.7%	63.3%	0.0%
2002	<u>\$2,613.0</u>	<u>\$938.7</u>	<u>\$1,667.7</u>	<u>\$6.6</u>	<u>35.9%</u>	<u>63.8%</u>	<u>0.3%</u>
<b>Total</b>	<b>\$23,521.5</b>	<b>\$9,197.8</b>	<b>\$13,684.2</b>	<b>\$639.5</b>	<b>39.1%</b>	<b>58.2%</b>	<b>2.72%</b>

<u>Year</u>	<u>Total</u>	<u>Direct</u>	<u>Indirect</u>	<u>Unspecified</u>	<u>Direct</u>	<u>Indirect</u>	<u>Unspecified</u>
			<u>Credit Value</u>		<u>Percent of Distribution</u>		
1993	\$2,162.1	\$708.2	\$1,323.0	\$130.9	32.8%	61.2%	6.2%
1994	\$2,161.5	\$774.1	\$1,221.9	\$165.4	35.8%	56.5%	7.7%
1995	\$3,390.8	\$1,257.9	\$2,132.9	NR	37.1%	62.9%	NR
1996	\$3,098.9	\$1,188.7	\$1,795.6	\$114.7	38.4%	57.9%	3.7%
1997	\$3,276.2	\$1,171.1	\$1,952.3	\$152.8	35.8%	59.6%	4.7%
1998	\$2,684.6	\$1,621.8	\$1,055.1	\$7.8	60.4%	39.3%	0.3%
1999	\$2,824.1	\$1,121.8	\$1,599.5	\$102.8	39.7%	56.6%	3.6%
2000	\$2,613.0	\$1,135.8	\$1,377.7	\$99.4	43.5%	52.7%	3.8%
2001	\$3,295.7	\$1,282.3	\$2,010.2	\$3.2	38.9%	61.0%	0.1%
2002	<u>\$3,281.5</u>	<u>\$1,108.2</u>	<u>\$2,165.8</u>	<u>\$7.5</u>	<u>33.8%</u>	<u>66.0%</u>	<u>0.2%</u>
<b>Total</b>	<b>\$28,788.4</b>	<b>\$11,369.9</b>	<b>\$16,634.1</b>	<b>\$784.4</b>	<b>39.5%</b>	<b>57.8%</b>	<b>2.7%</b>

<u>Year</u>	<u>Total</u>	<u>Direct</u>	<u>Indirect</u>	<u>Unspecified</u>	<u>Total</u>	<u>Direct</u>	<u>Indirect</u>	<u>Unspecified</u>
			<u>Multiplier</u>		<u>Percent of Transactions</u>			
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	1.307	1.456	1.227	1.035	601	208	383	10
2001	1.273	1.351	1.227	4.000	620	222	397	1
2002	<u>1.256</u>	<u>1.181</u>	<u>1.299</u>	<u>1.124</u>	<u>728</u>	<u>193</u>	<u>531</u>	<u>4</u>
<b>Total</b>	<b>1.224</b>	<b>1.236</b>	<b>1.216</b>	<b>1.385</b>	<b>5903</b>	<b>1972</b>	<b>3866</b>	<b>65</b>

**Source:** BIS Offsets Database

**NR** = None Reported

**Note:** Data for 2000 have been revised to reflect corrected information provided by reporting firms.

---

---

U.S. prime contractor. During 1993-2002, about 36 percent of the value of technology transfers was classified as direct offsets and 61 percent was indirect offsets; for the balance, the type was unspecified. Technology transfers accounted for 13 percent of the actual value of all offset transactions, and the multiplier for technology transfers was 1.368.

Credit Assistance includes direct loans, brokered loans, loan guarantees, assistance in achieving favorable payment terms, credit extensions, and lower interest rates. Credit assistance transactions accounted for 4.9 percent of the actual value of all transactions for 1993-2002. Credit assistance is nearly always classified as an indirect offset transaction, with indirect transactions making up more than 99 percent of the actual value of all credit assistance for the period. The multiplier for credit assistance was 1.137.

Training transactions relate 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; more than 62 percent of the value of training transactions was direct. Training accounted for only 3 percent of the total value of offset transactions between 1993 and 2002. The multiplier for training was 1.609, the second highest for all categories. Overseas Investments include capital invested to establish or expand a subsidiary or joint venture in the foreign country as well as investments in third-party facilities; the latter received the highest multipliers. Overseas investments accounted for just 2.3 percent of the actual value of all offset transactions, and usually were classified as indirect offsets; 75 percent of overseas investment transactions was classified as indirect. These transactions have the highest aggregate multiplier (2.762) of any category of offset transactions.

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. Virtually all of the co-production reported during the 1993-2002 period was aerospace-related. Co-production accounted for 1.9 percent of the value of offset transactions and had a multiplier of only 1.149, ranking just above the multipliers for purchases and subcontracts.

Past co-production transactions have involved constructing major production facilities in foreign countries (primarily at the expense of the foreign government) for the assembly of entire defense systems, such as aircraft, missiles, or ground systems. Co-production arrangements of this kind generally impose a high cost on the foreign government, including upfront construction and tooling costs and increased unit costs for limited production runs.<sup>10</sup> Some countries negotiate with prime contractors for production or assembly contracts related to future sales to third countries of the weapon system or system components.

Licensed Production is overseas production of a U.S. origin defense article. Licensed production differs from co-production in that it is based on 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,

---

<sup>10</sup> Primary examples include an Egyptian co-production facility which, since its 1988 inception, has only contracted enough orders to build half of what the government originally planned and a Japanese co-production program that cost the government nearly two times more per unit than an off-the-shelf purchase. See *Military Aid to Egypt: Tank Coproduction Raised Costs and May Not Meet Many Program Goals*, U.S. General Accounting Office, GAO/NSIAD-93-2003, and *U.S. Military Aircraft Coproduction with Japan* U.S. General Accounting Office, GAO/T-NSIAD-89-6.

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; 75 percent of the licensed production transactions (by actual value) was directly related to the weapon systems sold. The multiplier for licensed production was 1.314.

**Table 2-3 Offset Transactions by Category and Type, 1993 - 2002**

Transaction Category	Actual Values in \$ Millions				Percent by Column Total			
	Total	Direct	Indirect	Unspecified	Total	Direct	Indirect	Unspecified
Purchases	\$8,937.4	.0	\$8,503.8	\$433.6	38.0%	.00%	62.14%	67.81%
Subcontracts	\$6,701.3	\$6,701.3	.0	.0	28.49%	72.86%	.00%	.00%
Technology Transfers	\$3,059.1	\$1,093.2	\$1,874.3	\$91.6	13.01%	11.89%	13.70%	14.32%
Miscellaneous	\$1,815.5	\$409.1	\$1,496.6	\$9.8	7.72%	3.36%	10.94%	1.53%
Credit Assistance	\$1,142.8	\$5.1	\$1,137.7	.0	4.86%	0.06%	8.31%	.00%
Training	\$705.8	\$439.4	\$264.5	\$1.9	3.00%	4.78%	1.93%	0.29%
Overseas Investment	\$550.5	\$79.4	\$393.6	\$77.5	2.34%	0.86%	2.88%	12.11%
Co-production	\$455.7	\$454.6	.0	\$1.1	1.94%	4.94%	.00%	0.17%
Licensed Production	<u>\$153.3</u>	<u>\$115.7</u>	<u>#13.6</u>	<u>\$24.0</u>	<u>0.65%</u>	<u>1.26%</u>	<u>0.10%</u>	<u>3.76%</u>
<b>Total</b>	<b>\$23,521.5</b>	<b>\$9,197.8</b>	<b>\$13,684.2</b>	<b>\$639.5</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.0%</b>

Transaction Category	Credit Values in \$ Millions				Percent by Column Total			
	Total	Direct	Indirect	Unspecified	Total	Direct	Indirect	Unspecified
Purchases	\$9,921.1	.0	\$9,476.1	\$445.0	34.46%	.00%	56.97%	56.73%
Subcontracts	\$7,531.6	\$7,531.6	.0	.0	26.16%	66.24%	.00%	.00%
Technology Transfers	\$4,183.9	\$1,545.3	\$4,545.5	\$93.1	14.53%	13.59%	15.30%	11.87%
Miscellaneous	\$2,470.6	\$544.7	\$1,853.4	\$72.4	8.58%	4.79%	11.14%	9.24%
Credit Assistance	\$1,299.9	\$70.6	\$1,229.3	.0	4.53%	0.62%	7.39%	.00%
Training	\$1,135.4	\$681.2	\$440.9	\$13.4	3.94%	5.99%	2.65%	1.70%
Overseas Investment	\$1,520.7	\$339.8	\$1,052.8	\$128.2	5.28%	2.99%	6.33%	16.34%
Co-production	\$523.7	\$522.6	.0	\$1.1	1.820%	4.60%	.00%	0.14%
Licensed production	<u>\$201.5</u>	<u>\$134.1</u>	<u>\$36.1</u>	<u>\$31.2</u>	<u>0.70%</u>	<u>1.18%</u>	<u>0.22%</u>	<u>3.98%</u>
<b>Total</b>	<b>\$28,788.4</b>	<b>\$11,369.9</b>	<b>\$16,634.1</b>	<b>\$784.4</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>

Transaction Category	Multiplier				Number of Transactions			
	Total	Direct	Indirect	Unspecified	Total	Direct	Indirect	Unspecified
Purchases	1.110	.000	1.114	1.026	3002	0	2960	42
Subcontracts	1.124	1.124	.000	.000	1365	1365	0	0
Technology Transfers	1.368	1.414	1.358	1.017	608	273	330	5
Miscellaneous	1.361	1.762	1.238	7.385	404	83	316	5
Credit Assistance	1.137	13.830	1.081	.000	82	7	75	0
Training	1.609	.550	1.666	7.178	212	98	109	5
Overseas Investment	2.762	4.277	2.675	1.655	85	9	71	5
Co-production	1.149	1.150	.000	1.000	114	113	0	1
Licensed production	<u>1.314</u>	<u>1.160</u>	<u>2.660</u>	<u>1.300</u>	<u>31</u>	<u>24</u>	<u>5</u>	<u>2</u>
<b>Total</b>	<b>1.224</b>	<b>1.236</b>	<b>1.216</b>	<b>1.227</b>	<b>5903</b>	<b>1972</b>	<b>3866</b>	<b>65</b>

Source: BIS Offset Database

Miscellaneous transactions include activities such as feasibility studies, marketing assistance, export assistance, administrative support, business plan development, and trade conferences, among others. These varied transactions comprise 7.7 percent of the total, and the average multiplier during 1993-2002 was 1.361.

---

---

## Countries and Regions

Table 2-5 lists the countries, by region, with which U.S. firms reported entering offset agreements. Also shown are the average percentage of offset requirements of new agreements and the average multiplier applied to offset transactions in each country. In some cases, the average offset requirement or multiplier was not reported or could not be calculated; these instances are marked NR. In other cases, the offset requirement or multiplier is withheld to protect company confidentiality; these cases are marked W.

Austria led Europe and the rest of the world in terms of its offset percentage; on average, U.S. weapon system exports to Austria were associated with offset agreements worth 174.2 percent of the value of the weapon system. At the same time, Austria offered the lowest reported multiplier for offset transactions carried out in fulfillment of the agreements.

Other European countries required offset percentages equal to or greater than the value of the weapon systems exported to them. These countries included the Netherlands (120.5 percent), Greece (110.5 percent), Sweden (103.9 percent), Denmark (100 percent), and Finland (100 percent). In the rest of the world, only one country, South Africa, required offsets greater than the price of the weapon systems it purchased; its average offset percentage was 116.7 percent. These six countries offered multipliers of 1 or more for offset transactions.

Portugal required an average offset percentage of 27.9 percent, the lowest of all countries. Its multiplier was also among the most generous, at 2.24 times the actual value of transactions. It should be noted that the average regional offset percentages required by countries in Europe and Asia increased since the previous report on offsets in defense trade. In the previous report, which covered 1993-2000, Europe's average offset percentage was 92.3 percent; with the addition of 2001 and 2002, the average rose slightly to 92.6 percent. In Asia, the average grew from 26.2 percent to 40 percent.

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

The DPA requires that Commerce determine the impact of offsets on defense preparedness, industrial competitiveness, employment, and trade of the United States. This chapter discusses the impact of offsets on defense preparedness and employment; the impacts on industrial competitiveness and trade of the United States will be discussed in Chapter 6.

### 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, in case they are 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 ñ can negate some of these benefits. U.S. subcontractors and suppliers are displaced by exports that include subcontract or licensed production offsets. Previous examples indicate that U.S. contractors sometimes develop long-term supplier relationships with overseas subcontractors based on short-term offset requirements.<sup>11</sup> These new relationships can reduce future business

---

11 See GAO report on offset activities, *Defense Trade: U.S. Contractors Employ Diverse Activities to Meet Offset Obligations*, December 1998 (GAO/NSIAD-99-35), P.; 4-5.

**Table 2 - 5 Countries with Offset Agreements and Transactions  
By Region, 1993-2002**

<b>Europe</b>		
<u>Country</u>	<u>Percent Offsets</u>	<u>Multiplier</u>
Austria	174.2%	0.84
Belgium	W	1.09
Czech Republic	W	W
Denmark	100.0%	1.27
EPG	27.8%	1.23
Finland	100.0%	1.07
France	84.6%	1.74
Germany	W	1.00
Greece	110.5%	2.60
Italy	93.8%	1.05
Luxembourg	NR	W
Netherlands	120.5%	1.21
Norway	99.5%	1.41
Portugal	27.9%	2.24
Slovenia	W	NR
Spain	88.8%	1.26
Sweden	103.9%	1.15
Switzerland	78.1%	1.01
United Kingdom	<u>92.1%</u>	<u>1.01</u>
<b>Region Total</b>	<b>92.6%</b>	<b>1.21</b>

<b>North and South America</b>		
<u>Country</u>	<u>Percent Offsets</u>	<u>Multiplier</u>
Brazil	W	W
Canada	83.1%	.997
Chile	<u>W</u>	<u>NR</u>
<b>Region Total</b>	<b>90.8%</b>	<b>1.013</b>

<b>Middle East and Africa</b>		
<u>Country</u>	<u>Percent Offsets</u>	<u>Multiplier</u>
Egypt	NR	1.00
Israel	49.2%	1.05
Kuwait	30.2%	2.52
Saudi Arabia	34.9%	NR
South Africa	W	W
Turkey	61.5%	1.07
United Arab Emirates	<u>55.3%</u>	<u>2.33</u>
<b>Region Total</b>	<b>44.0%</b>	<b>1.11</b>

<b>Asia</b>		
<u>Country</u>	<u>Percent Offsets</u>	<u>Multiplier</u>
Australia	45.6%	1.03
Indonesia	NR	1.21
Malaysia	37.3%	1.12
New Zealand	W	W
Singapore	58.3%	2.27
South Korea	64.7%	1.45
Taiwan	21.2%	2.21
Thailand	<u>26.5%</u>	<u>1.79</u>
<b>Region Total</b>	<b>40.0%</b>	<b>1.49</b>

**Source:** BIS Offsets Database

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

---

---

opportunities for U.S. subcontractors, with possible consequences for the industrial base. Offsets can also increase spending and capital investment in foreign countries for defense or non-defense industries.

### **Employment**

While it is difficult to determine precisely the impact of offset agreements and transactions on employment in the U.S. defense sector, BIS has developed an estimate by using employment data collected by the Bureau of the Census. Given that sales of aerospace weapon systems account for nearly 85 percent of the value of defense exports connected with offset agreements, this method appears to provide a reliable estimate.

For 2001,<sup>12</sup> industry reported approximately \$7.0 billion<sup>13</sup> in defense export contracts with an offset agreement attached. According to the *Annual Survey of Manufactures*, the value added per employee for the aerospace product and parts manufacturing industry in 2001 was \$165,858. Dividing this figure into the defense export sales total results in a total of 42,440 work-years that were supported in that year by defense exports associated with offset agreements.

However, by their very nature, subcontracting, purchasing, co-production, and licensing 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. BIS bases its estimate of employment impacts only on the specified types of transactions. For 2001, these transactions were valued at \$1.9 billion. Dividing \$1.9 billion by \$165,858 (the value added by each worker in the aerospace industry in 2001) results in the loss of approximately 11,460 work-years for 2001, assuming the foreign contract could have been won without an offset agreement.

Based on these calculations, it appears that defense export sales had a net positive effect on employment in the defense sector in 2001, although the net positive effect was diminished by the offset agreements. It should be noted that the above analysis does not include an additional \$687 million of offsets in technology transfer, training, overseas investment, and marketing transactions, because the impact of these transactions on the U.S. defense industrial base is difficult to calculate. Further, this calculation assumes that industry would not have received these defense export contracts if it had not entered into the related offset agreements.

### **Offset Agreements Activity, 1993 Through 2002**

According to offset data collected from industry covering 1993 to 2002, 39 U.S. firms reported entering into 434 offset agreements with a total value of \$41.8 billion. These offset agreements were made with foreign purchasers in 36 different countries and were associated with defense export contracts valued at \$63.6 billion. The exports involved 181 U.S. weapon systems. The value of the offset agreements represented 65.7 percent of the total value of the related export contracts during the entire reporting period.<sup>17</sup> The average term for completing the offset agreements was 100 months, or slightly more than eight years.<sup>18</sup> The percentage of offset agreements to export contracts (by value) declined slightly from previous years to 78.1 percent in

---

12 The year 2001 was used because 2002 Census data on value added was not available during the preparation of this report. See the U.S. Census Bureau website at <http://www.census.gov/prod/www/abs/industry.html>.

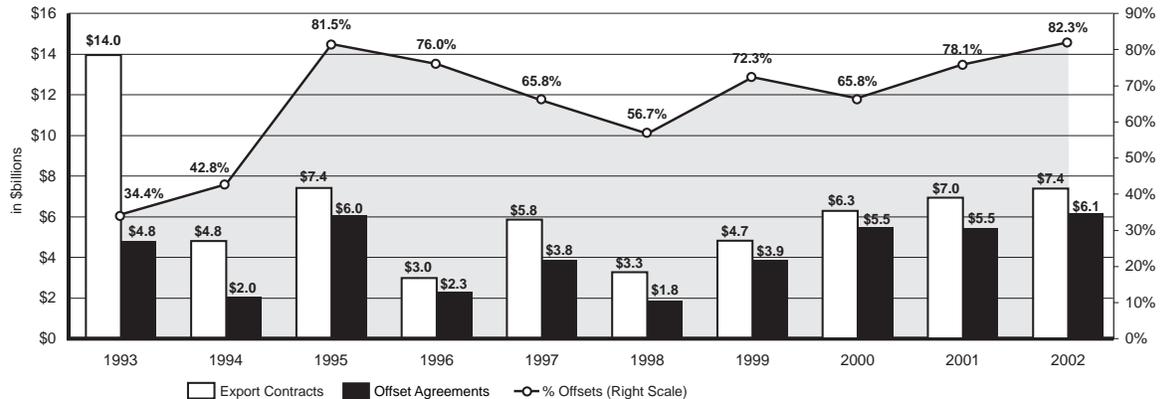
13 The following calculation is based on the assumption that this value represents 100 percent U.S. content in all exports, not necessarily an accurate assumption.

17 The figure of 65.7 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 68.7 percent.

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

2001 and then rebounded in 2002 to 82.3 percent. The lowest percentage was recorded in 1993 at 34.4 percent, the highest in 2000 at 87.6 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 4.75 percentage points per year over the ten-year reporting period.<sup>19</sup>



Source: BIS Offsets Database

**Chart 4 - 1 Reported Export Contracts and Offset Agreements Annually, 1993-2002 (in \$ billions).**

### Offsets Concentration

The data reported by U.S. companies show that a small number of companies, countries, and weapon systems dominated offset agreements between 1993 and 2002. The top five U.S. exporters (of 39 companies reporting data on offsets) accounted for 79.5 percent of the defense export contracts and 79.0 percent of the offset agreements during this timeframe. 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 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 36 involved in the reported offset activity) accounted for 58.6 percent of the total defense system purchases and 57.8 percent of the total offset agreements. The top ten countries (of 36 total) represented 73.1 percent of defense system purchases and 74.7 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. 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.

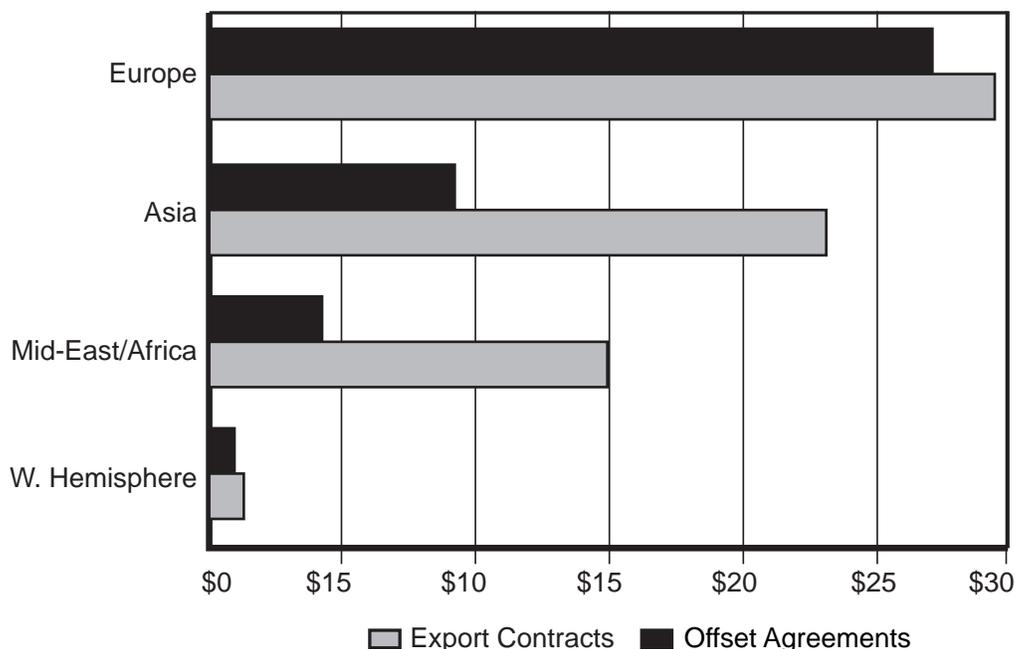
<sup>19</sup> the percentage increase was calculated using a linear least-squares function of only the annual percent values.

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 181 weapon systems sold) were aircraft systems. These top five exports accounted for 44.4 percent of the value of all export contracts and 37.3 percent of the offset agreements during the reporting period. The top ten defense systems accounted for 59.3 percent of the export contracts and 56.9 percent of the offset agreements during the reporting period.

### Regional Distributions

European countries dominated offset activity during the reporting period. Europe alone accounted for 65 percent of the value of offset agreements during the reporting period, while at the same time accounting for 46 percent of the value of U.S. defense export contracts. Asian countries ranked a distant second in both categories, accounting for over 22 percent of the value of offset agreements and 37 percent of related U.S. export contract values. However, Asia's share of offset agreements is growing. In 2000, Asia accounted for only 2.8 percent of the value of offset agreements. The same year, European agreements comprised 78 percent of total offset agreements. By 2002, those numbers changed significantly: Europe was the source of 33.6 percent of the value of offset agreements (compared to 78 percent in 2000), while Asian offsets had climbed sharply to 64.8 percent (compared to 2.8 percent) of the total.

For the ten-year reporting period, Middle Eastern and African countries also had significant shares, accounting for nearly 10.5 percent of the value of offset agreements and 15.6 percent of the value of U.S. export contract business. Offsets with countries in North and South America (Canada, Brazil, and Chile) were less significant, accounting for approximately two percent of the value of offset agreements and 1.5 percent of the total value of related U.S. defense export contracts. Chart 4-2 illustrates regional totals of U.S. defense export contracts and offset agreements for 1993 to 2002.



Source: BIS Offsets Database

**Chart 4 - 2 Regional Totals of Export Contracts and Offset Agreements, 1993-2002 (in \$ billions)**

Although Europe still accounts for the preponderance of offset agreements by value, non-European countries' offset requirement percentages are increasing significantly. For 1993-2000,

---

---

the average offset requirement for non-European countries totaled only 33.9 percent. The past two reporting years alone boosted that percentage nearly 10 percent. Non-European countries accounted for 204 offset agreements that totaled \$14.5 billion from 1993 to 2002, half of the European total. The average offset agreement for non-European countries was valued at \$72 million and had a term of 78 months.

Overall, Middle Eastern countries and certain countries in the Pacific area generally demand lower offset levels than European countries. Of the 204 offset agreements with non-European countries, 136 (two-thirds) had offset percentages of 50 percent or less. Only 35 (one-sixth) of the offset agreements had percentages of 100 percent or more, and 11 of these had offset requirements in excess of 100 percent. Indeed, one offset agreement had an offset requirement of 333 percent, although this was associated with a relatively small defense export contract.

In general, the data show that countries with developed, technically advanced economies have demanded higher levels of offsets than other countries. As more economies and their military programs advance technically (e.g., Chile, South Africa, South Korea, and Turkey), higher levels of offset requirements are likely to continue. More advanced economies are able to absorb more offsets, both direct and indirect. Typically, their infrastructures are more advanced, and they are more likely than other countries already to have in place a diverse pool of industries among which to distribute offset transactions.

### **Are Offset Demands Increasing?**

The data show not only that offset demands are increasing, but also that more countries outside Europe are demanding these higher offsets. Although historically low, offset requirements outside Europe are rising. Two-thirds of the non-European offset agreements valued at 100 percent or more of the export contract value have occurred since 1998. Of the 35 agreements with offset requirements of 100 percent or more, 13 were with Canada and another six were with Turkey.

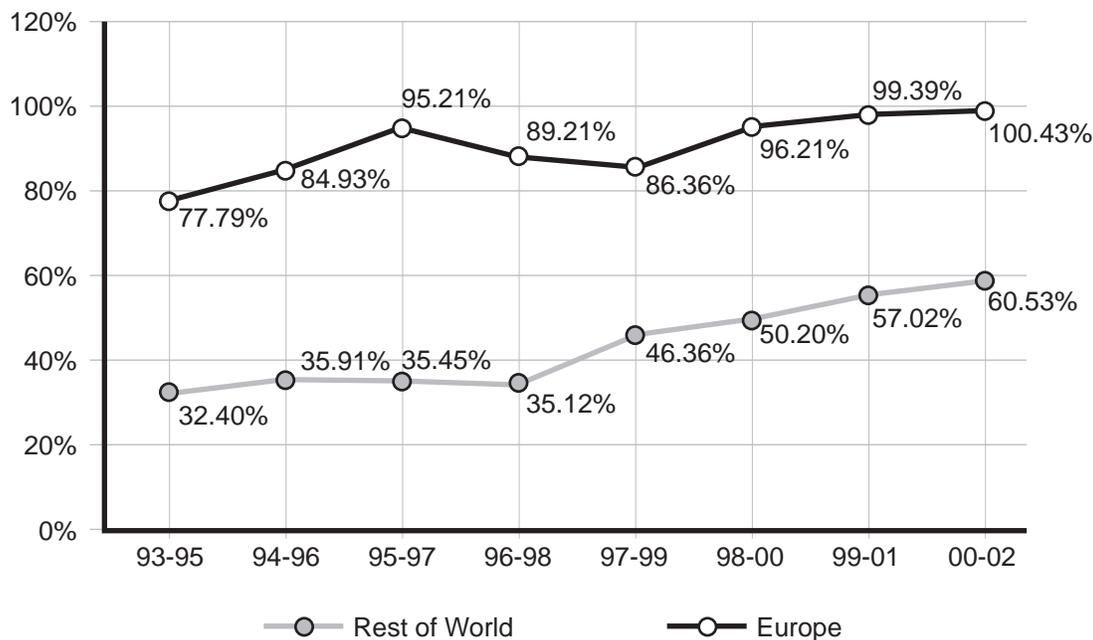
Moreover, in the last three years, countries entering into offset agreements with U.S. firms for the first time have demanded 100 percent or more. Overall, evidence of these increases outside Western Europe began in 1999 when the offset percentage demanded by non-European countries reached an average of 66.8 percent. After a decline in negotiated offset requirements in 2000 and 2001, 2002 offset requirements by non-European countries rose to nearly 80 percent. This level reflects a substantial turnaround from 2001.

Agreements entered into by South Korea and Turkey illustrate the growing trend in non-European offset demands. From 1993 to 1998, the average offset requirement (by value) demanded of U.S. firms by South Korea was 36.5 percent. In contrast, from 1999 to 2002, that average nearly doubled to 71.0 percent. From 1993 to 1998, offset percentages (by value) demanded by Turkey of U.S. firms averaged 52.3 percent. However, Turkey's offset requirements jumped in 1999-2002 to 95.7 percent.

European offset demands also continued to increase over the ten-year period, although more slowly than offset demands in the rest of the world. The trend in offset requirements for European countries increased at an annual rate of 1.6 percentage points. For the rest of the world, the average increase in offset percentages was 5.5 percentage points per year. Based on the three-year weighted averages in Chart 4-3, European offset requirements increased an average of 2.26 percentage points each year in the period, while non-European demands increased 2.81 percentage points. These values are in comparison to the rest-of-world unweighted average of 4.8 percent each year and the weighted average of 2.95 percent.

A reason for the upward trend in defense offset requirements 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. As sales opportunities narrowed, competition for such sales became more intense. Higher-than-normal overhead related to low levels of capacity utilization in defense industries coupled with competitive pressures on prices also have squeezed corporate profits. On the other hand, foreign purchasing governments are under pressure to sustain their indigenous defense companies or to create new ones and, accordingly, are demanding more offsets. Coupled with the recent world economic slowdown, significant public outlays for foreign-made weapon systems become even more controversial, which leads to higher offset demands to deflect political pressure.



Source: BIS Offsets Database

**Chart 4 - 3: Percentage Offsets for Europe vs. Rest of World (Weighted Moving Average, 1993-2002).**

### Offset Transaction Activity, 1993-2002

An offset agreement typically comprises multiple transactions entered into by the selling party to satisfy the requirements of the agreement. Analyzing transactions provides the basis upon which the impacts of offsets on the U.S. defense industrial base are estimated.

During the time period 1993 to 2002, 42 U.S. defense companies reported 5,903 offset transactions with a total value of \$23.5 billion. The reported offset transactions were completed with 39 different countries. The offset transactions were conducted in fulfillment of 230 U.S. weapon system exports, some dating from the 1980s. U.S. firms received a total of \$28.8 billion in credit toward open offset obligations during the reporting period, yielding a composite multiplier of 1.224 (i.e., credit value divided by offset value). Almost 14 percent of offset transactions (812) earned extra credit (i.e., had a multiplier greater than 1). The yearly value of offset transactions averaged \$2.35 billion.

The data in Table 5-2 show that seven countries were the recipients of approximately 63.2 percent of the actual value of all offset transactions. These seven countries had a composite multiplier of 1.099, and each country, with the exception of Spain, had more than \$1 billion in

offset transactions during the reporting period. The multipliers for the top seven countries ranged from 1.007 for the United Kingdom to 2.602 for Greece.

**Table 5-2 Offset Transactions by Leading Countries  
Total, 1993-2002**

<b>Country</b>	<b>Actual Value</b>	<b>Credit Value</b>	<b>Multipliers</b>
United Kingdom	\$4,379,418,474	\$4,408,472,682	1.007
Finland	\$3,216,337,843	\$3,446,007,399	1.071
Israel	\$2,470,037,632	\$2,588,738,935	1.048
Netherlands	\$1,503,777,165	\$1,822,252,935	1.212
Switzerland	\$1,191,633,656	\$1,200,286,037	1.007
South Korea	\$1,146,489,676	\$1,663,977,863	1.451
Greece	<u>\$1,036,652,820</u>	<u>\$2,698,232,819</u>	<u>2.602</u>
<b>Total</b>	<b>\$14,944,347,266</b>	<b>\$17,827,971,670</b>	<b>1.193</b>
<b>Percent of All</b>	<b>63.53%</b>	<b>61.92%</b>	
<b>All Countries (39)</b>	<b>\$23,521,538,193</b>	<b>\$28,788,386,498</b>	<b>1.224</b>

Source: BIS Offsets Database

### Offset Transactions by Type

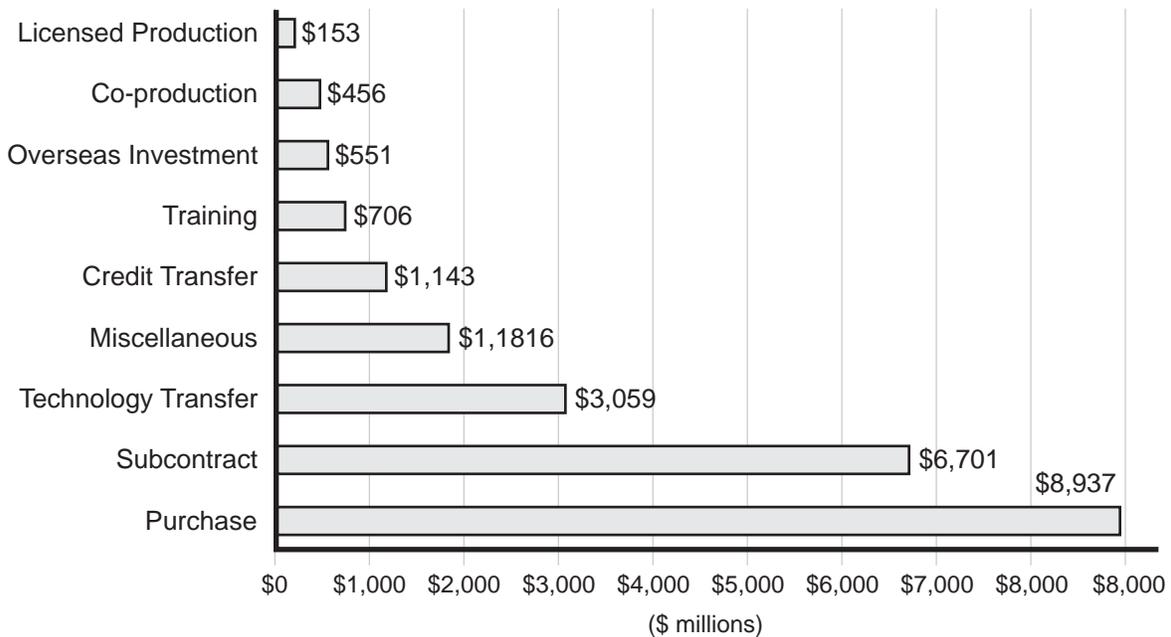
For 1993-2002, direct offsets accounted for 39.1 percent (\$9.2 billion) of the total value of offset transactions. Indirect offsets accounted for 58.2 percent (\$13.7 billion) of the value of offset transactions. The remaining 2.7 percent (\$639.5 million) consisted of transactions that were not specified as direct or indirect. The level of direct offset transactions varied greatly from year to year, based mostly on which countries dominated the offset activity. The same variation held for indirect offsets.

### Offset Transactions by Category

Three categories of offset transactions dominated offset activity during 1993-2002: purchases, subcontracts, and technology transfers. These three categories accounted for 79.5 percent of the value of all offset transactions during the timeframe. Purchases (38.0 percent) and subcontracts (28.5 percent) together accounted for almost two-thirds of the value of total offset transactions. Technology transfers made up an additional 13.0 percent. Most of the remaining 25 percent of the value of offset transactions was categorized as miscellaneous (7.7 percent) and credit transfer (4.9 percent). The remaining 7.9 percent of the value of offset transactions was distributed among the other four categories: training, overseas investment, co-production, and licensed production. Chart 5-3 shows the distribution of offset transactions by category.

All thirty-nine countries involved in offset transaction 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, electronic components, software, and educational and consulting services. Almost 49 percent of all offset transactions categorized as purchases were aerospace-related.

Twenty-seven countries were recipients of offset transactions classified as subcontracts. Subcontracts are considered direct offset transactions, and the overwhelming majority of subcontracts involved aerospace-related manufactured parts, components, and services. Aerospace-related transactions accounted for 87.4 percent of the total value of all offset transactions categorized as subcontracts.



Source: BIS Offsets Database

**Chart 5 - 3: Offset Transactions by Category, 1993-2002 (in \$ millions).**

### 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 79.1 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 a U.S. defense system as well as its future maintenance requirements. Offset transactions in these three categories totaled \$7.3 billion during the ten-year reporting period, with subcontracts by far the largest portion (\$6.7 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 more than \$8.5 billion during the period and accounted for 62.2 percent of the value of all offsets classified as indirect. In total, during the reporting period, \$15.8 billion in overseas production or an average \$1.58 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.

### Aerospace Offset Issues

Given its large percentage of the total value of U.S. military exports, the U.S. aerospace industry is affected by offsets more than any other major economic sector. Indeed, from 1993 through 2002, aerospace-related military exports exceeded \$53.5 billion. By comparison, non-

aerospace military exports for the period only reached nearly \$10 billion. Because aerospace-related exports make up the majority (85 percent) of export sales associated with offset agreements, the impact of offsets on the aerospace industry is a good indicator of the effect of offsets on the competitiveness and trade of the U.S. defense industrial base as a whole.

During 1998-2000, however, the rate of growth of aerospace exports declined. The growth rate for offset-related exports during the ten-year period shows a trend toward more non-aerospace exports, including maritime, ground transport, and high-tech navigation and radar systems. Indeed, 60 percent of all offsets-related aerospace exports occurred during 1993-1997 and only 40 percent occurred in the last five reporting years. Conversely, more than 70 percent of non-aerospace offsets-related exports were generated in 1998-2002.

### Trends in the Import and Export Markets

The following analysis looks at trends in the import and export markets of all aerospace trade, both civil and military, unless otherwise noted. The U.S. maintained a trade surplus in aerospace products during 1993-2002, ranging from a low of \$21.6 billion in 1995 to a high of \$41.0 billion in 1998. A large growth in imports during 1998-2001, coupled with flat or declining exports, drove down the surplus to \$26.0 billion in 2001. The U.S. trade surplus rebounded slightly in 2002 as imports declined sharply, overshadowing a slight decline in exports. Military-related aerospace exports have remained flat since 2000 at a level marginally higher than \$9 billion and lower than in 1998 (\$12 billion) and 1999 (\$11.8 billion).<sup>23</sup>

Primary countries of origin for U.S. aerospace imports over the past decade have included Canada, France, Germany, and the United Kingdom. The import rate of growth varied significantly among the top six sources for U.S. aerospace imports. During the 1993-2001 period (in 2002, imports from each of the six countries declined), annual imports from Germany increased nearly eight-fold, those from Canada almost quadrupled, and import levels from British and French sources doubled. Other countries also posted significant gains during the period, including a nearly four-fold increase in imports from Japan and a 16-fold increase in imports from Brazil. Table 6-1 shows the value of imports of civil and military aerospace products from a list of the major source countries.

	<b>1993</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>
Brazil	119	73	110	154	371	917	1,285	1,494	1,973	1,868
Canada	2,072	2,443	2,461	3,233	3,800	4,867	5,087	6,253	7,985	7,003
France	4,249	4,087	3,072	3,043	4,087	5,814	6,313	8,071	8,721	7,591
Germany	478	699	826	1,039	1,187	2,044	2,707	3,364	3,775	2,488
Japan	538	583	671	1,081	1,728	2,148	1,710	1,614	1,986	1,507
United Kingdom	2,523	2,546	2,236	2,634	4,034	5,173	4,968	4,197	4,818	3,600

**Source:** Aerospace Industries Association, *Aerospace Facts and Figures*, various issues includes civil and military products, cost, insurance, and freight basis.

The rapid increases in aerospace product imports from key sources, specifically Brazil, Germany, and Japan, indicate several trends for the U.S. aerospace industry. First, U.S. aerospace markets, primarily the commercial sector, are increasingly using foreign-made, imported systems

<sup>23</sup> See Aerospace Industries Association (AIA), *Aerospace Facts & Figures*, 2003/2004 (and prior editions). Data also available through AIA's website, at [www.aia-aerospace.org](http://www.aia-aerospace.org).

---

and components. Second, the sources of these improving and more competitive products are becoming more varied internationally. Brazilian, German, and Japanese manufacturers, specifically, are relative newcomers to the sizeable U.S. aerospace market in the last ten years.

The defense trade also feels the effects of these two trends, increasing competitiveness and growing foreign firms. With more high-quality aerospace firms producing goods, there is more competition and a likelihood of fewer sales for existing firms. The resulting more crowded global aerospace market increases the reliance on offsets as a negotiation factor.

### **Trends in Aerospace**

The aerospace infrastructure is becoming more global, more integrated, and at the same time, more competitive. Globalization is exhibited by the wide reach of key firms. For example, European manufacturer Airbus maintains 1,500 suppliers from thirty countries; 250 of these suppliers are located in the United States. By mid-2002, the Airbus A380 team had signed contracts to source landing gear from U.S.-based Goodrich, navigation electronics from Honeywell, and in some versions, jointly developed GE-Pratt & Whitney engines.<sup>25</sup> American competitor Boeing has more than 11,300 suppliers in sixty-six countries and maintains offices in eighteen countries. In June 2003, the company announced that five key supply contracts would go to foreign firms, including three from Japan.<sup>26</sup> Honeywell alone has operations in 100 countries and derives 45 percent of its sales from outside the United States.<sup>27</sup>

As globalization increases, U.S. aerospace manufacturers broaden their global supplier chains seeking both subcontractors and strategic partnerships. At the same time, European counterparts are taking advantage of longer historical relationships in non-U.S. defense markets, thus increasing the competitive environment worldwide.<sup>28</sup> Although the United States continues to maintain its position in first-tier integrator companies, with around half of the global aerospace market, European companies are growing and now command more than one-third of all global aerospace sales.<sup>29</sup>

The market power of these mega-firms can require lower tier suppliers to compete at cost and quality levels on a par with foreign suppliers.<sup>32</sup> Moreover, a global competitive situation arises where European Union firms generate sales and technology levels on a par with the large U.S. companies. Of the top seven aerospace companies by defense sales in 1999, three were these European mega-firms, and one BAE Systems had higher defense sales than any U.S.

---

25 From Airbus company overview information, [www.airbus.com](http://www.airbus.com), and Sally B. Donnelly, "America Helps Build the Bus," *Time*, Vol. 160, Issue 5, 29 July 2002, B14.

26 From Boeing company overview information, [www.boeing.com](http://www.boeing.com), and company press releases.

27 Remarks from Bob Johnson, president and CEO of Honeywell Aerospace. Reported in "World Aerospace Industry Is One Big Happy Family, Says Honeywell Executive," *Manufacturing and Technology News*, 17 October 2003.

28 Jerry Grossman, "Thinking Global: A Choice or a Mandate?," *Washington Technology*, 27 August 2001.

29 In 2002, the export share of the U.S. aerospace industry accounted for 49 percent of global industry turnover. The European Union aerospace industry accounted for 35 percent of worldwide turnover. Data from AECMA 2002 Facts and Figures. Available at: [http://www.aecma.org/Publications/AECMA\\_Factsn\\_Figures\\_2002.pdf](http://www.aecma.org/Publications/AECMA_Factsn_Figures_2002.pdf).

32 From a recent study by A.T. Kearney comparing the aerospace supplier base to the automotive supplier base. The study noted that, reminiscent of the automakers in the mid-1990s, aerospace suppliers are under increasing pressure to compete with rivals in other countries; sometimes required to move sub-tire businesses to non-traditional regions in return for large deals from prime contractors. *Restructuring the Global Aerospace Industry: The Shifting Roles of Suppliers*, A.T. Kearney, 2003.

---

manufacturer.<sup>33</sup> This increase in viable competition to a once formidable U.S. industry creates much greater competition in third-country markets.<sup>34</sup> Increased offsets are a likely consequence of increased global competition.

### **Integration - F-35 Joint Strike Fighter**

Falling defense spending in both Europe and the United States after the Cold War led to the purchase of fewer weapon systems. Defense companies in both Europe and the United States increasingly targeted each others markets for defense sales. To achieve these sales against a backdrop of political resistance to imports of defense products in both the United States and Europe, aerospace companies on both sides began forming transatlantic alliances. Cross-border integration within the industry continues to grow, with firms which regularly compete for sales in some sectors forming partnerships in others. U.S defense suppliers prefer these partnerships or alliances to mergers, because they

“allow companies to choose new partners in each market in which they compete, increase capabilities without forming permanent relationships, and enable access to unique technology needed to meet military requirements.”<sup>35</sup>

These forms of cross-border collaboration include joint ventures, strategic alliances, co-development programs, and strategic teaming agreements and are almost entirely U.S. and E.U., U.S.-U.S., or E.U.-E.U. aerospace company agreements.<sup>36</sup>

As an example of a co-development program, the F-35 Joint Strike Fighter (JSF) program combines a number of U.S. and European firms, at both prime, Lockheed Martin, Northrop Grumman, and BAE Systems, and subsystem levels, General Electric, Pratt and Whitney, and Rolls Royce, as well as the governments of the United States, the United Kingdom, Italy, the Netherlands, Canada, Turkey, Denmark, Norway, and Australia. Each partnering country has firms contributing to the project at the development level, and each provides public sector annual funding to the program. For example, the Italian government is contributing around \$1 billion, while a number of Italian aerospace companies, including Alenia Aeronautica, recently sent engineers and technicians to the main development site in Texas. The British government is contributing \$2 billion to the program, and BAe Systems is one of the key industry partners while Rolls Royce and Pratt & Whitney have teamed up to develop the engine propulsion system. Danish and Italian firms recently partnered with a U.S. firm to develop the JSF's gun-related components.<sup>37</sup>

---

33 From Company Reports, *Going Global? U.S. Government Policy and the Defense Aerospace Industry*, RAND's Project Air Force, 2002, pg. 5-6.

34 *Going Global? U.S. Government Policy and the Defense Aerospace Industry*, RANDS's Project Air Force, 2002, page 8.

35 *Defense Trade: Contractors Engage in Varied International Alliances*, GAO Report, September 2000, GAO/NSIAD-00-213.

36 Additional cross-border joint corporate efforts, other than the JSF described here, include a Northrup Grumman/EADS strategies alliance to develop surveillance systems and radar technology, an SAIC/Boeing/EADS/France/British-German-Dutch defense research organizations team developed to bid for a North Atlantic Treaty Organization Theater Missile Defense project, and a Thales-Taytheon 50-50 joint venture focusing on air defense and command-and-control centers and air surveillance systems. See *Going Global? U.S. Government Policy and the Defense Aerospace Industry*, RANDS's Project Air Force, 2002; Chapter Five.

37 *F-35 Joint Strike Fighter Team Newsletter*, Issue No. 5 Summer 2003, published quarterly by JSF Operations.

---

Given the continued need for transatlantic sales and the growing requirement for armed forces interoperability among the United States and its allies, industry experts and defense policymakers on both continents expect this innovative multi-national system of development, testing, and production to continue in future large-scale system procurements. Indeed, these individuals largely see it as a necessity.<sup>38</sup> Such partnerships may also lead to reduced offset demands, as more countries become involved at early stages of development.

### **Changing Nature of Offsets**

The globalization of the industry affects the trade picture that is closely linked to offset transactions and agreements. American aerospace companies conducted five times more trade between their offshore wholly-owned facilities and their European partners in 2000 than they did in 1996.<sup>40</sup>

Moreover the industry recently has begun changing its approach to developing military systems, which may have an impact on the growth of offsets in the future. The multi-national and multi-corporate JSF program has created a situation where governments contribute in the form of development funding and implied future orders in order to receive domestic industrial benefits, such as production of one or more pieces of the F-35 system by a domestic firm. In turn, the U.S. project participants gain technological know-how through this cooperative effort, and the U.S. government is relieved of some of the funding burden. Offsets are not required in this type of arrangement. Such cross-border joint contract, development, and production projects are expected to become much more prevalent in the future as governments look at cost factors and interoperability requirements grow.

### **Conclusions**

The data show that offset demands are on the rise globally. Although offsets with European countries accounted for more than two-thirds the value of total agreements during 1993-2002, offset agreements with non-European countries, especially in Asia, have risen sharply in the past two reporting years, capturing a majority of all new contracts. In a weighted, moving average comparison, European offset demands have increased only 30 percent points from 1993 to 2002, while the rest of the world has nearly doubled its average offset requirements in the same period.

Asian countries are capturing an increasing share of offset agreements and export contracts as well as demanding higher offsets. In fact, Asian countries accounted for about 65 percent of the value of new offset agreements in 2002, up from only 2.8 percent in 2000. In contrast, European agreements represented 78 percent of the total value of offset agreements in 2000, but only 34 percent in 2002. Further, new offset requirements from Asian countries climbed to 52.3 percent in 2001 and jumped to 78.4 percent in 2002.

The aerospace sector continued to attract the majority of offset agreements, accounting for almost 85 percent of the value of defense exports associated with offsets during 1993-2002. Despite the large majority of offset exports involving aerospace-related products over the ten-year period, the rate of growth of these exports declined during the 1998-2002 period, indicating a trend toward more non-aerospace offset-related exports, including maritime, ground transport, and high-tech navigation and radar systems.

---

38 See the final report of the Commission on Transatlantic Security and Industrial Cooperation in the 21st Century, *The Future of the Transatlantic Defense Community*, Center for Strategic and International Studies, Washington, D.C., January 2003. John Hamre, former Deputy Secretary of Defense, was the Project Chairman. Report available at: [http://www.csis.org/pubs/2003\\_future.pdf](http://www.csis.org/pubs/2003_future.pdf).

40 European Association of Aerospace Industries Statistical Data Report 2000.

---

BIS estimates that U.S. defense exports with offset agreements required supported 42,440 work-years in 2001. However, the kinds of offset transactions (co-production, subcontracting, purchasing, and licensing) most likely to result in the transfer of work from the U.S. to foreign firms reduce the number of hours supported by 11,460 work-years. Based on these calculations, it appears that defense export sales had a net positive effect on employment in the defense sector, although the net positive effect was diminished by the offset agreements. This calculation assumes that industry would not have received these defense export contracts if it had not entered into the related offset agreements. It should also be noted that the above analysis does not include other kinds of offset transactions, valued at about \$687 million, including technology transfer, training, overseas investment, and marketing transactions, or the long-term implications of creating or enhancing competitors; the impact of these transactions on the U.S. defense industrial base is difficult to calculate.

The Department of Commerce neither encourages nor regulates the use of offsets in defense trade and recognizes that offsets can be market distorting. However, it should be recognized that offsets are a part of the current international defense trade environment. 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, under authorities granted under the DPA, Commerce is committed to work with U.S. industry, the Department of Defense, other U.S. government agencies, and foreign governments to analyze the impact of offsets on all parties and seek ways to mitigate their effect on defense preparedness, industrial competitiveness, employment, and trade. The Department's goal is to support the U.S. defense industry and to ensure a robust and vibrant industrial base.