Offsets in Defense Trade

Twenty-Second Study

Conducted Pursuant to Section 723 of the Defense Production Act of 1950, as Amended

U.S. Department of Commerce
Bureau of Industry and Security

June 2018

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Executive Summary

This is the twenty-second annual report to Congress on the impact of offsets in defense trade prepared by the U.S. Department of Commerce's Bureau of Industry and Security (BIS) pursuant to Section 723 of the Defense Production Act (DPA) of 1950, as amended.[1] Offsets in defense trade encompass a range of industrial compensation arrangements required by foreign governments as a condition of the purchase of defense articles and services from a non-domestic source.

BIS collects data annually from U.S. firms involved in defense exports with associated offset agreements in order to assess the impact of offsets in defense trade.[2] In 2016, U.S. defense contractors reported entering into 33 new offset agreements with 14 countries valued at $1.5 billion. The value of these agreements equaled 34.26 percent of the $4.4 billion in reported contracts for sales to foreign entities of defense articles and services with associated offset agreements. In 2016, U.S. firms also reported 508 offset transactions conducted to fulfill prior offset agreement obligations with 26 countries at an actual value of $2.6 billion, and an offset credit value of $3.1 billion.

This report notes that exports of defense articles and services can lower overhead costs for the Department of Defense (DOD); help sustain production facilities, workforce expertise, and the supplier base to support current and future U.S. defense requirements; promote interoperability of defense systems, subsystems and components between the United States and friends and allies; and contribute positively to U.S. international account balances. However, offset agreements and associated offset transactions can negate some of the potential economic and industrial base benefits accrued through defense exports if the offset activity displaces work that would otherwise have been conducted in the United States.

Items offered as part of an offset transaction may require an export license from the relevant U.S. Government agency. For items that require an export license, such as items controlled for Missile Technology reasons, exporters are advised to consult with the Departments of Commerce, Defense, and State to obtain export control policy guidance prior to offering such items as part of an offset transaction.

[1] Codified at 50 U.S.C. § 4568 (2015).

[2] Pursuant to 15 CFR Part 701 (2017).

1 Background

Offsets in defense trade encompass a range of industrial and commercial benefits provided to foreign governments as an inducement or condition to purchase military goods or services, including benefits such as co-production, licensed production, subcontracting, technology transfer, purchasing, and credit assistance. This mandatory compensation can be directly related to the purchased defense article or service or it can involve activities or goods unrelated to the defense sale.

In 1984, the U.S. Congress amended the Defense Production Act (DPA) to require the President to submit an annual report to Congress on the impact of offsets on the U.S. defense industrial base.[3] The Office of Management and Budget was the first agency appointed as the interagency coordinator for preparing the report for Congress. In 1992, Congress amended the DPA and directed that the Secretary of Commerce function as the President's Executive Agent in preparing the annual report to Congress.[4] Section 723 of the DPA authorizes the Secretary of Commerce to develop and administer the regulations necessary to collect offset data from U.S. firms.[5] The Secretary of Commerce has delegated this authority to the Bureau of Industry and Security (BIS). BIS published its offset reporting regulation in 1994.[6] BIS amended its offset regulation in 2009 and in 2016.[7]

The U.S. Government policy on offsets in defense trade states that the government considers offsets to be "economically inefficient and trade distorting," and prohibits any agency of the U.S. Government from encouraging, entering directly into, or committing U.S. firms to any offset arrangement in connection with the sale of defense articles or services to foreign governments.[8] U.S. defense contractors generally see offsets as a reality of the marketplace for companies competing for international defense sales. Several U.S. defense contractors have informed BIS that offsets are usually necessary in order to make defense sales – sales which can help support the U.S. industrial base.

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

[4] See Pub. L. 102-558, Oct. 28, 1992, 106 Stat. 4198; see also Part IV of Exec. Order No. 12919, 59 Fed. Reg. 29,525 (June 3, 1994) and Part VII of Exec. Order 13603, Fed. Reg. 16,651 (March 22, 2012).

[5] Previously, the offset report was submitted pursuant to Sec. 309 of the Defense Production Act of 1950. However, as a result of the Defense Production Act Reauthorization of 2009, Pub. L. 111-67, which rewrote Title III of the Act and introduced a new Sec. 723 on offsets, the report is now submitted pursuant to Sec. 723. Section 723 is largely the same in content as the prior Sec. 309.

[6] See 59 Fed. Reg. 61,796 (December 2, 1994) codified at 15 C.F.R. § 701.

[7] See 74 Fed. Reg. 68,136 (December 23, 2009) and 81 Fed. Reg. 10,472 (March 1, 2016).

[8] Defense Production Act Amendments of 1992 (Pub. L. 102-558, Title I, Part C, § 123).

This is the twenty-second report to Congress on offsets in defense trade that BIS has prepared. This report reviews offset data for the 24-year period from 1993-2016.[9] BIS structured this report similarly to reports published in 2008 through 2016; the chapters correspond with the sequence of events for defense sales involving offsets. In preparing this report, BIS has incorporated data from other U.S. Government sources, including the Department of Defense (DOD), the Bureau of the Census (Census), and the Bureau of Economic Analysis (BEA).

On June 9, 2017, BIS published a notice in the *Federal Register* to remind the public that U.S. firms are required to report annually on contracts for the sale to foreign governments or foreign firms of defense articles or defense services that are subject to offset agreements exceeding $5,000,000 in value, and offset transactions completed in performance of existing offset commitments for which offset credit of $250,000 or more has been claimed by the foreign representative.[10] Twenty-two firms reported offset agreement and transaction data to BIS for calendar year 2016. The data elements collected each year from industry are listed in Section 701.4 of the BIS offset reporting regulation and were referenced in the *Federal Register* notice.

BIS prepared this report in consultation with the Departments of Defense, State and Labor, and the Office of the United States Trade Representative. These agencies provided no alternative findings or recommendations.

[9] The initial offsets report, issued in 1996, covered the time period from 1993 to 1994; each subsequent offset report added an additional year to the reporting period, with the exception of the eighth report, which added two years.
[10] See 82 Fed. Reg. 26,775 (June 9, 2017).

2 Defense Export Sales with Offset Agreements

In 2016, six U.S. firms reported entering into 33 contracts that had related offset agreements for the sale of defense items and services. These contracts, signed with 14 countries, were valued at $4.4 billion.[11] The offset agreements were valued at $1.5 billion which equaled 34.26 percent of the value of the signed defense export sales contracts, which is well below the historic average of approximately 60.67 percent and is the lowest annual average offset percentage since BIS began collecting data in 1993. During 2016, reported offset agreements ranged from a low of 1.94 percent of the defense export sales contract value to a high of 100 percent.

In 2016, approximately 75.76 percent of the signed offset agreements reported by U.S. industry included penalties for non-performance of the offset obligation. Those penalties included liquidated damages, increases in the obligation amount or offset requirement, added fees based on unfilled offset commitments, or bank credit guarantees.

Table 2-1: Summary of Defense Export Sale Contract Values with Related Offset Agreements, 1993 – 2016

Year	Contract Value ($ millions)	Offset Agreement Value ($ millions)	Percent of Offset Agreement to Contract Value	U.S. Firms (Number)	Agreements (Number)	Countries (Number)/Multi-Country Arrangements
1993	$13,935	$4,784	34.33%	17	28	16
1994	$4,792	$2,049	42.75%	18	49	20
1995	$7,632	$6,204	81.30%	21	48	18
1996	$3,120	$2,432	77.94%	16	53	19
1997	$5,925	$3,826	64.56%	15	60	20
1998	$3,079	$1,786	57.99%	14	42	17
1999	$5,657	$3,457	61.11%	11	45	11
2000	$6,576	$5,705	86.75%	10	43	16
2001	$7,116	$5,550	77.99%	12	35	13
2002	$7,406	$6,095	82.29%	12	41	17
2003	$7,293	$9,110	124.92%	11	31	13
2004	$4,934	$4,331	87.78%	14	41	18
2005	$2,260	$1,464	64.79%	8	25	18
2006	$5,265	$3,655	69.42%	15	48	21
2007	$6,932	$5,469	78.89%	11	45	20
2008	$6,442	$3,835	59.53%	17	56	17
2009	$11,065	$6,847	61.89%	15	65	21
2010	$4,019	$2,451	60.98%	15	34	14
2011	$10,989	$5,665	51.56%	9	63	27
2012	$25,706	$10,414	40.51%	12	49	17
2013	$9,995	$5,175	51.87%	17	69	19
2014	$13,111	$7,731	58.96%	14	46	15
2015	$8,180	$3,183	38.90%	13	40	16
2016	$4,352	$1,491	34.26%	6	33	14
Total or Average	**$185,780**	**$112,707**	**60.67%**	**61**	**1,089**	**50**

Source: BIS Offset Database
Note: Due to rounding, totals may not add up exactly. Figures for certain previous years have been revised. The values shown have not been adjusted for inflation.

[11] All the countries involved in 2016 contracts that had related offset agreements for the sale of defense items and services were countries industry has reported offset agreements to BIS in previous reporting years.

Chart 2-1: Summary of Defense Export Sale Contract Values with Related Offset Agreements (2007-2016)

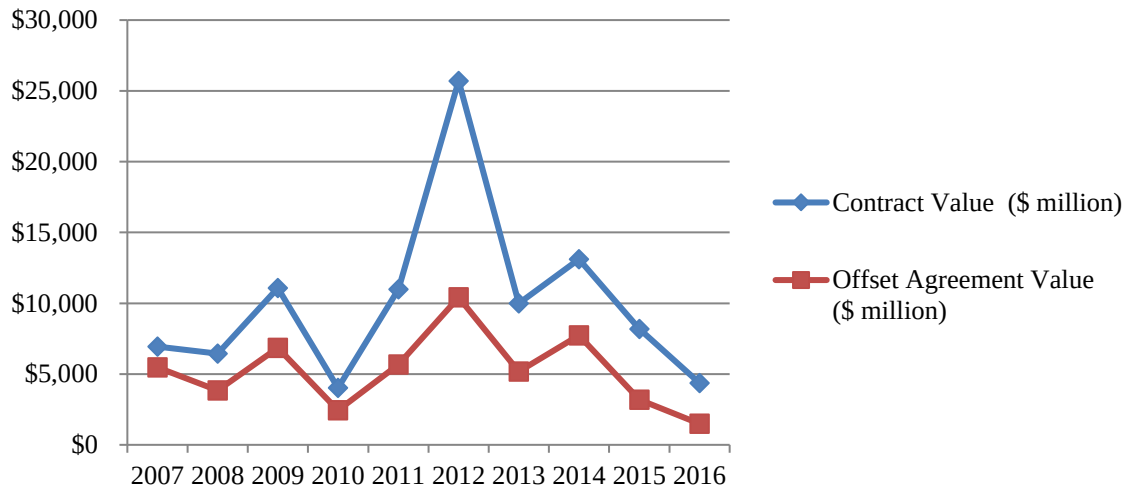
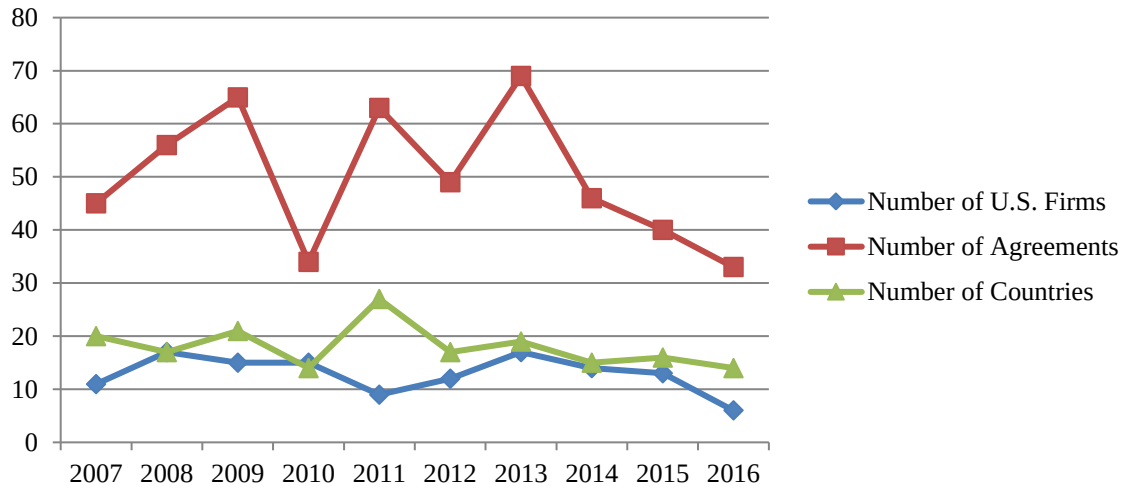


Chart 2-2: Summary of Defense Export Sales with Related Offset Agreements (2007-2016)



See Annex A for data on reported offset agreements by country for 2016 and Annex B for reported offset agreements by country during the 1993-2016 period.

During 1993-2016, 61 U.S. firms reported entering into 1,089 offset-related defense export sales contracts worth $185.8 billion with 50 countries and three multi-country arrangements. The associated offset agreements were valued at $112.7 billion.

3 Offset Transactions

In 2016, 20 U.S. firms reported concluding 508 offset transactions with 26 countries to fulfill offset agreement obligations. This is the second lowest number of offset transactions reported since BIS began collecting data in 1993. The offset transactions reported by U.S. firms had an actual value of $2.6 billion in 2016 and a credit value of $3.1 billion. In 2016, U.S. industry reported that 59 offset transactions (11.61 percent of all transactions completed during the 12-month period) had a multiplier greater than one applied and 25 transactions (4.92 percent of all transactions completed during the 12-month period) had a multiplier of less than one applied.[12]

Table 3-1: Summary of Offset Transactions, 1993 – 2016

Year	Actual Offset Transaction Value ($ millions)	Credit Offset Transaction Value ($ millions)	U.S. Firms (Number)	Transactions (Number)	Countries (Number)/Multi-Country Arrangements
1993	$1,898	$2,214	22	444	27
1994	$1,935	$2,206	21	566	26
1995	$2,890	$3,593	21	711	25
1996	$2,876	$3,098	22	634	26
1997	$2,721	$3,272	19	578	26
1998	$2,312	$2,623	20	582	29
1999	$2,060	$2,808	13	513	25
2000	$2,190	$2,749	16	626	24
2001	$2,543	$3,201	16	616	25
2002	$2,620	$3,148	18	734	26
2003	$3,563	$4,008	17	689	31
2004	$4,935	$5,366	16	710	33
2005	$4,722	$5,439	13	624	30
2006	$4,706	$4,906	16	661	28
2007	$3,805	$4,742	19	633	28
2008	$3,291	$4,768	22	671	30
2009	$3,495	$4,129	23	702	28
2010	$3,608	$4,477	25	707	28
2011	$3,880	$5,062	21	740	31
2012	$3,438	$3,843	22	690	30
2013	$3,189	$3,563	21	546	32
2014	$3,864	$4,289	17	672	29
2015	$5,049	$5,323	19	651	26
2016	$2,634	$3,064	20	508	26
Total or Average	**$78,222**	**$91,890**	**66**	**15,208**	**47**

Source: BIS Offset Database
Note: Due to rounding, totals may not add up exactly. Figures for certain previous years have been revised. The values shown have not been adjusted for inflation.

[12] A multiplier is a factor applied to the actual value of certain offset transactions to calculate the credit value earned. Foreign purchasers use multipliers to provide firms with incentives to offer offsets that benefit targeted areas of economic growth. When a multiplier greater than one is applied to the value of a service or product offered as an offset, the defense firm receives a higher credit value toward fulfillment of an offset obligation than would be the case without application of a multiplier. Conversely, foreign purchasers apply multipliers less than one to discourage certain types of transactions.

Chart 3-1: Summary of Offset Transaction Values (2007-2016)

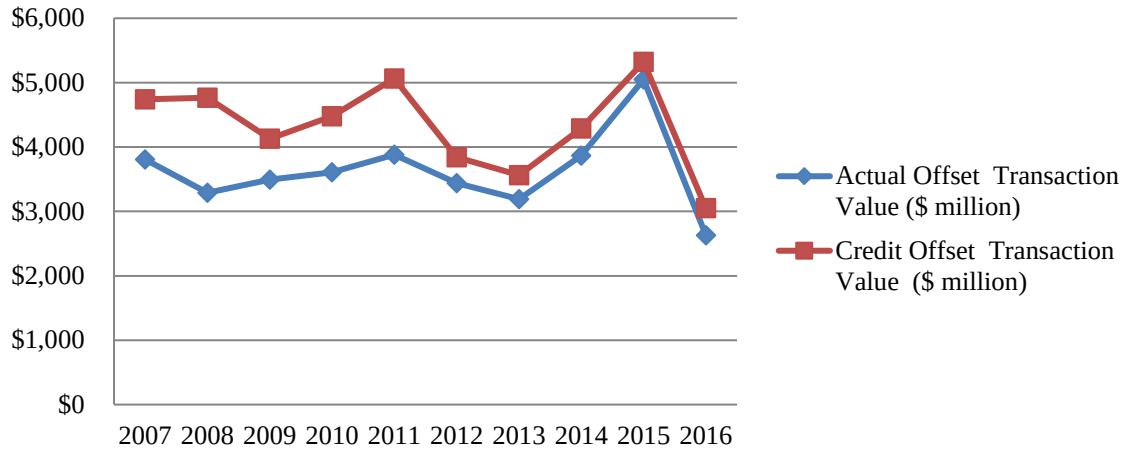
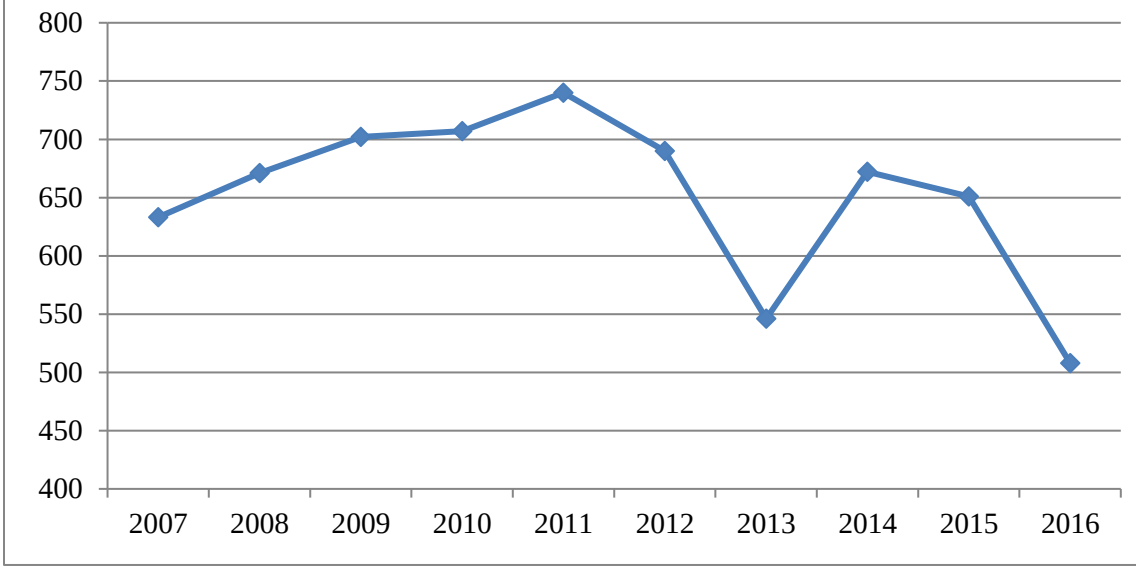
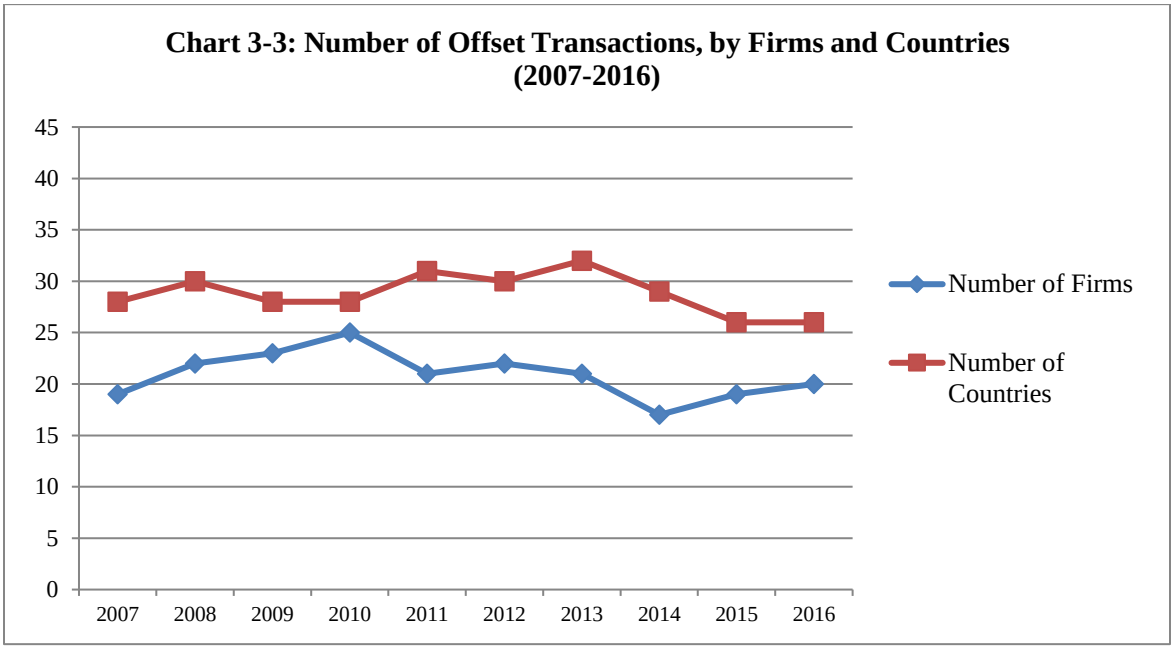


Chart 3-2: Number of Offset Transactions (2007-2016)





U.S. firms are required to classify offset transactions by type (direct or indirect) and report to BIS offset transactions by category specifically describing the nature of the transaction. In the offset reporting regulation, BIS has categorized offset transactions as one of the following: co-production, technology transfer, subcontracting, credit assistance, training, licensed production, investment, purchases, and other.[13] See Annex E for definitions of each offset transaction category.

In 2016, direct offsets (transactions directly related to the defense export sale with an associated offset agreement) accounted for 34.36 percent of the actual value of reported offset transactions. Indirect offsets (transactions not directly related to the defense export sale with an associated offset agreement) accounted for 65.62 percent of the actual value of reported offset transactions.[14] During 1993-2016, direct offsets accounted for 38.98 percent of the actual value of the reported offset transactions, with indirect offsets accounting for 59.25 percent.[15]

[13] With respect to the export of any item or technology from the United States, U.S. export control laws apply. Whether or not an export is associated with an offset agreement, U.S. exporters must comply with U.S. export control requirements, which include, among other things, licensing requirements. License applications are carefully reviewed by the appropriate U.S. Government agencies to ensure that the proposed export of an item (commodity, software or technology) or service is consistent with U.S. laws, regulations, and foreign policy and national security considerations. Where no license is required, U.S. exporters must comply with end-use and end-user restrictions.

[14] The total does not equal 100 percent because a small number of reported offset transactions are not specified as direct or indirect.

[15] The total does not equal 100 percent because a small number of reported offset transactions are not specified as direct or indirect.

The top three offset transaction categories reported by industry for 2016 were purchases, subcontracting, and "other".[16] These three categories represented 82.28 percent of all offset transactions reported for 2016 based on quantity, 83.87 percent of the transactions based on actual value, and 77.12 percent of the transactions based on credit value.

Of the total number of transactions reported in 2016 that included a multiplier greater than one, the top three offset transaction categories were technology transfer, subcontracting, and "other". Technology transfer accounted for 27.12 percent of these transactions, subcontracting accounted for 22.03 percent, and "other" accounted for 15.25 percent.

The top three offset transaction categories reported by industry for the 24-year reporting period (1993-2016) were: purchases, subcontracting, and technology transfer on the basis of quantity, actual value, and credit value. These three categories represented 81.04 percent of all transactions based on quantity, 76.39 percent of all transactions based on actual value, and 72.26 percent based on credit value. Purchasing alone accounted for 46.59 percent of all transactions based on quantity, 38.96 percent based on actual value, and 35.14 percent based on credit value. From 1993-2016, based on quantity, the top three offset transaction categories that included multipliers greater than one were purchases, technology transfer, and subcontracting, respectively.

See Annex A for data on reported offset transactions by country for 2016 and Annex B for reported offset transactions by country for the 1993-2016 period. Annex C presents a summary of reported offset transactions by type, category, value, and with multipliers on an annual basis during the 24-year reporting period (1993-2016).

[16] The "other" category includes transactions that were identified as having a combination of categories.

4 Impact of Offsets on the U.S. Industrial Base

Defense export sales can be an important component of U.S. defense contractors' revenues and further U.S. foreign policy and economic interests. Exports of major defense systems can also lower overhead and unit costs for DOD, and help sustain production facilities, workforce expertise, and the supplier base to support current and future U.S. defense requirements. Exports also promote interoperability of defense systems between the United States and friends and allies, and contribute positively to U.S. international trade account balances. However, offset agreements and associated offset transactions may lessen some of the potential economic and industrial base benefits accrued through defense exports if the offset activity associated with defense exports displaces work that otherwise would have been conducted in the United States and/or if competitors are established in foreign countries.[17]

Studies and discussions between industry and U.S. Government officials indicate that, at times, U.S. prime contractors develop long-term supplier relationships with foreign subcontractors based on short-term offset requirements. These new relationships, combined with the mandatory offset requirements related to offset agreements, may limit future business opportunities for U.S. subcontractors and suppliers, and may have negative consequences for the domestic industrial base. Other kinds of offsets, such as technology transfers, may increase research and development spending and capital investment in foreign countries for defense or non-defense industries, and thereby may help to create or enhance current and future competitors to U.S. industry.

Export and Offset Activity Trends

According to end-use export data published by Census, the value of U.S. merchandise exports totaled approximately $1.5 trillion in 2016.[18] Defense-related merchandise exports totaled $21.7 billion in 2016, or 1.49 percent of total U.S. merchandise exports.[19] In 2016, U.S. industry reported entering into offset-related defense export sales contracts worth $4.4 billion. However, the value of U.S. merchandise exports cannot be directly compared with the value of defense export sales contracts and offset agreements because export data reflect actual shipments made

[17] See Government Accountability Organization (GAO) report on offset activities, "Defense Trade: U.S. Contractors Employ Diverse Activities to Meet Offset Obligations," December 1998 (GAO/NSIAD-99-35), pp 4-5.

[18] Census, U.S. International Trade Data, U.S. Exports by 5-digit End-Use Code 2007-2016, https://www.census.gov/foreign-trade/statistics/product/enduse/exports/index.html

[19] The value of defense exports includes the exports categorized under the following export end-use codes: (50000) Military aircraft, complete; (50010) Aircraft launching gear, parachutes, etc.; (50020) Engines and turbines for military aircraft; (50030) Military trucks, armored vehicles, etc.; (50040) Military ships and boats; (50050) Tanks, artillery, missiles, rockets, guns, and ammunition; (50060) Military apparel and footwear; and (50070) Parts for military-type goods. The end-use data series does not include exports of defense services. See https://www.census.gov/foreign-trade/statistics/product/enduse/exports/index.html.

during the calendar year and there is usually a lag of several years between the conclusion of a contract for a defense sale and the beginning of shipments. See Table 4-1 for defense-related merchandise exports and offset activity trends from 2003–2016.

Table 4-1: U.S. Merchandise Exports and Reported Offset Activity, 2003 – 2016

Year	Total Merchandise Exports ($ millions)	Defense-Related Merchandise Exports ($ millions)	Defense-Related Exports as a Percentage of Total Merchandise Exports	Value of Reported Defense Export Sale Contracts with Related Offset Agreements ($ millions)	Value of Reported Offset Agreements ($ millions)	Value of Reported Offset Transactions ($ millions)
2003	$724,771	$11,565	1.60%	$7,293	$9,110	$3,563
2004	$814,875	$11,884	1.46%	$4,934	$4,331	$4,935
2005	$901,082	$12,835	1.42%	$2,260	$1,464	$4,722
2006	$1,025,968	$16,629	1.62%	$5,265	$3,655	$4,706
2007	$1,148,199	$16,894	1.47%	$6,932	$5,469	$3,805
2008	$1,287,442	$16,594	1.29%	$6,442	$3,835	$3,291
2009	$1,056,043	$14,796	1.40%	$11,065	$6,847	$3,495
2010	$1,278,495	$15,304	1.20%	$4,019	$2,451	$3,608
2011	$1,482,508	$14,911	1.01%	$10,989	$5,665	$3,880
2012	$1,545,821	$17,231	1.11%	$25,706	$10,414	$3,438
2013	$1,578,517	$17,617	1.12%	$9,995	$5,175	$3,189
2014	$1,621,873	$20,555	1.27%	$13,111	$7,731	$3,864
2015	$1,503,101	$20,318	1.35%	$8,180	$3,183	$5,049
2016	$1,451,011	$21,675	1.49%	$4,352	$1,491	$2,634

Sources: BIS Offset Database and Census' End-Use Export Data and U.S. Trade in Goods – Balance of Payments Basis vs. Census Basis. Reported offset-related data for certain previous years have been revised. The values shown have not been adjusted for inflation.

Economic Impact of Offsets on U.S. Industrial Activity and Employment

BIS amended its offset reporting regulation in 2009 to require that companies assign the appropriate North American Industry Classification System (NAICS) code(s) to each offset-related defense export sales contract and to each offset transaction reported. Prior to 2009, BIS required industry to classify offset transactions and defense export sales by broad industry descriptions. The change to NAICS classification reporting has allowed BIS to gather more accurate information on defense export sales with related offset agreements and offset transactions. This enhances BIS's ability to assess the economic impact of offsets on the U.S. industrial base by allowing BIS to better utilize other data published by statistical agencies of the U.S. Government.

Reported Defense Export Sales by Industry Sector

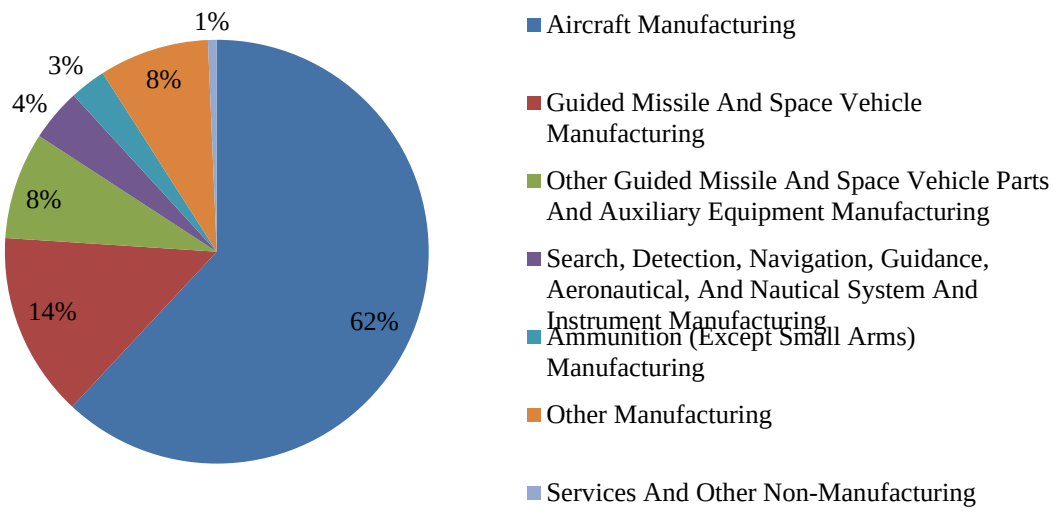
Industry sectors, as defined in the NAICS, include both manufacturing and non-manufacturing (including services) sectors. During 2014-2016, 99.34 percent of the reported defense export sales contracts with offset agreements were manufacturing-related based on the total value of reported contracts. That percentage drops to 96.62 percent when based on the total number of reported export sales contracts. The top five manufacturing-based sectors reported by industry during 2014-2016 based on the value of reported defense export sales contracts were aircraft manufacturing (NAICS 336411); guided missile and space vehicle manufacturing (NAICS 336414); other guided missile and space vehicle parts and auxiliary equipment manufacturing (NAICS 336419); search, detection, navigation, guidance, aeronautical, and nautical system and instrument manufacturing (NAICS 334511); and ammunition (except small arms) manufacturing (NAICS 332993). These five categories represented 67.23 percent of all defense export sales contracts reported during 2014-2016 based on quantity and 90.94 percent of the defense export sales contracts based on value. See Table 4-2.

Table 4-2: Reported Defense Export Sales by Industry Sector, 2014 – 2016

Industry Sector	Value of Reported Defense Export Sales Contracts	Percent of Total Value of Defense Export Sales Contracts	Number of Defense Export Sales Contracts	Percent of the Total Number of Defense Export Sales Contracts
Total Manufacturing	**$25,469,658,119**	**99.34%**	**115**	**96.62%**
Aircraft Manufacturing	$15,884,958,831	61.95%	25	21.01%
Guided Missile and Space Vehicle Manufacturing	$3,610,624,852	14.08%	21	17.65%
Other Guided Missile and Space Vehicle Parts and Auxiliary Equipment Manufacturing	$2,092,373,783	8.16%	14	11.76%
Search, Detection, Navigation, Guidance, Aeronautical, and Nautical System and Instrument Manufacturing	$1,027,600,000	4.01%	14	11.76%
Ammunition (Except Small Arms) Manufacturing	$705,277,961	2.75%	6	5.04%
Other Manufacturing	$2,148,822,692	8.38%	35	29.41%
Total Services and Other Non-Manufacturing	**$173,761,930**	**0.67%**	**4**	**3.36%**
Grand Total	**$25,643,420,049**	**100%**	**119**	**100%**

Source: BIS Offset Database
Due to rounding, totals may not add up exactly.

Chart 4-1: Percent of Total Value of Defense Export Sales Contracts by Industry Sector, 2014 - 2016

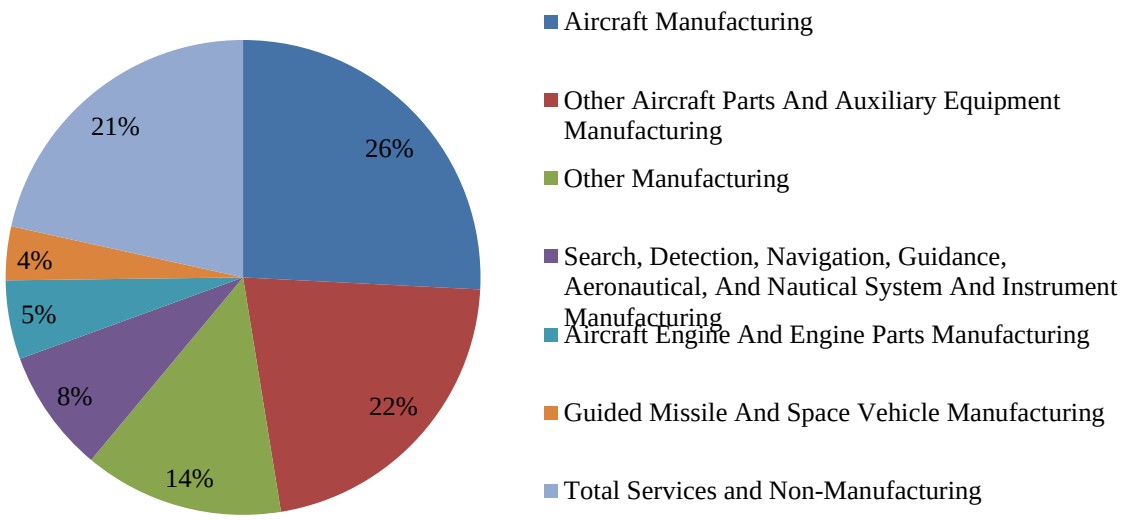


Reported Offset Transactions by Industry Sector

During 2014-2016, 78.48 percent of reported offset transactions were manufacturing-related based on the total actual value of reported offset transactions and 76.90 percent based on the total number of reported offset transactions. The top five sectors reported by industry during 2014-2016 based on the total actual value were aircraft manufacturing (NAICS 336411); other aircraft parts and auxiliary equipment manufacturing (NAICS 336413); search, detection, navigation, guidance, aeronautical, and nautical system and instrument manufacturing (NAICS 334511); aircraft engine and engine parts manufacturing (NAICS 336412); and guided missile and space vehicle manufacturing (NAICS 336414). These five categories represented 50.14 percent of all offset transactions reported for 2014-2016 based on quantity and 64.89 percent of offset transactions based on actual value. See Table 4-3.

Table 4-3: Reported Offset Transactions by Industry Sector, 2014 – 2016				
Industry Sector	**Total Actual Value**	**Percent of the Total Actual Value**	**Number of Transactions**	**Percent of the Total Number of Transactions**
Total Manufacturing	**$9,062,561,381**	**78.48%**	**1,408**	**76.90%**
Aircraft Manufacturing	$2,981,536,947	25.82%	276	15.07%
Other Aircraft Parts and Auxiliary Equipment Manufacturing	$2,499,491,009	21.65%	356	19.44%
Search, Detection, Navigation, Guidance, Aeronautical, and Nautical System and Instrument Manufacturing	$968,536,479	8.39%	153	8.36%
Aircraft Engine and Engine Parts Manufacturing	$619,784,762	5.37%	78	4.26%
Guided Missile and Space Vehicle Manufacturing	$422,191,870	3.66%	55	3.00%
Other Manufacturing	$1,571,020,313	13.61%	490	26.77%
Total Services and Other Non-Manufacturing	**$2,484,470,574**	**21.52%**	**423**	**23.10%**
Other Support Activities for Air Transportation	$910,243,417	7.88%	54	2.95%
Engineering Services	$458,027,717	3.97%	123	6.72%
Custom Computer Programming Services	$286,103,190	2.48%	86	4.70%
All Others	$830,096,250	7.19%	160	8.74%
Grand Total	**$11,547,031,953**	**100.00%**	**1,831**	**100.00%**
Source: BIS Offset Database Due to rounding, totals may not add up exactly				

Chart 4-2: Reported Offset Transactions - Percent of the Total Actual Value by Industry Sector, 2014-2016



BIS compared defense export sales contracts and offset transactions reported for 2014-2016 with data published by the Census on total 2013-2015 U.S. shipments of selected manufacturing industry sectors to provide context for the volume of offset activity relative to the U.S. economy.[20] Industry reported defense export sales contracts with 16 NAICS codes and offset transactions with 111 NAICS codes. The comparison of 2014-2016 offset-related data with 2013-2015 U.S. shipment data highlights that, while the reported defense export sales contracts accounted for a significant percentage of U.S. shipment data in certain manufacturing industry sectors, reported offset transactions data did not account for a significant percentage of U.S. shipment data in any manufacturing industry sector. See Table 4-4.

[20] 2016 shipment data from Census was not published in time for inclusion in this report. Therefore, Census data for the 2013-2015 period was used for comparison.

Table 4-4: 2014-2016 Reported Manufacturing Defense Export Sales and Reported Manufacturing Offset Transactions and 2013-2015 Value of U.S. Product Shipments by Industry Sector			
Reported Manufacturing Defense Export Sales Contracts			
Industry Sector	**Value of Reported 2014-2016 Defense Export Sales Contracts**	**Total Value of 2013-2015 U.S. Product Shipments**	**Percent of Defense Export Sales Contracts to Total U.S. Product Shipments**
Total Manufacturing	**$25,469,658,119**	**$1,066,688,058,000**	**2.39%**
Aircraft Manufacturing	$15,884,958,831	$361,886,770,000	4.39%
Guided Missile and Space Vehicle Manufacturing	$3,610,624,852	$65,115,063,000	5.54%
Other Guided Missile and Space Vehicle Parts and Auxiliary Equipment Manufacturing	$2,092,373,783	$8,476,129,000	24.69%
Search, Detection, Navigation, Guidance, Aeronautical, and Nautical System and Instrument Manufacturing	$1,027,600,000	$122,765,700,000	0.84%
Ammunition (Except Small Arms) Manufacturing	$705,277,961	$4,401,898,000	16.02%
Other Manufacturing*	$2,148,822,692	$504,042,498,000	0.43%
Reported Manufacturing Offset Transactions			
Industry Sector	**Value of Reported 2014-2016 Offset Transactions**	**Total Value of 2013-2015 U.S. Product Shipments**	**Percent of Transactions to Total U.S. Product Shipments**
Total Manufacturing	**$9,062,561,381**	**$5,314,313,858,000**	**0.17%**
Aircraft Manufacturing	$2,981,536,947	$361,886,770,000	0.82%
Other Aircraft Parts and Auxiliary Equipment Manufacturing	$2,499,491,009	$121,574,668,000	2.06%
Search, Detection, Navigation, Guidance, Aeronautical, and Nautical System and Instrument Manufacturing	$968,536,479	$122,765,700,000	0.79%
Aircraft Engine and Engine Parts Manufacturing	$619,784,762	$114,747,305,000	0.54%
Guided Missile and Space Vehicle Manufacturing	$422,191,870	$65,115,063,000	0.65%
Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing	$282,355,517	$70,487,690,000	0.40%
Other Manufacturing*	$1,288,664,797	$4,457,736,662,000	0.03%

Source: BIS Offset Database and Census *2015 Annual Survey of Manufacturers(ASM): Value of Products Shipments: Value of Shipments for Product Classes* (includes data from 2013 to 2015)

* The "Other Manufacturing" category in the Defense Export Sales Contracts table includes nine NAICS codes reported by U.S. defense contractors and the "Other Manufacturing" category in the Offset Transactions table includes 60 NAICS codes reported by U.S. defense contractors. The U.S. shipment data corresponds to those reported NAICS codes.

Note: 2016 shipment data from Census was not published in time for inclusion in this report.

Offset-Related Impact Analysis

Given the variety of the reported defense export sales contracts and the number of reported offset transactions, it is not possible to determine precisely the impact of the defense export sales contracts, offset agreements, and offset transactions on industrial activity and employment.

However, utilizing the BEA's *Benchmark Input-Output Accounts of the United States* (I/O accounts),[21] and Census' *Annual Survey of Manufactures (ASM)* data,[22] BIS has developed a method to approximate the value added shipment and employment impact of offset activities across the United States' economic sectors.

During 2014-2016, industry reported defense export sales contracts involving offsets valued at $25.5 billion in manufacturing industry sectors for which Census publishes annual employment and value-added data by NAICS code. Based on the I/O accounts, the value of "inputs" from all other industry sectors associated with the $25.5 billion in defense export sales contracts was $31.2 billion as shown in Table 4-5.[23] BIS estimates, using Census' *ASM* data, this $31.2 billion in inputs would create or sustain 108,168 employment opportunities.[24] As shown in Table 4-5, the I/O accounts also demonstrate how these defense export sales contracts have a positive multiplier effect not only on selected U.S. manufacturing industry sectors but on hundreds of other U.S. economic sectors that supply inputs related to the export sales contracts. This analysis assumes that all the work associated with the defense export sales contracts is conducted in the United States.

However, offset transactions generally have a negative impact on U.S. inputs because they are primarily conducted outside the United States and represent activity that is not provided by the U.S. economy. For the purpose of this analysis, BIS has also assumed that all the work associated with offset transactions would have been conducted in the United States if there were no offset agreement in place. BIS estimates, using Census' *ASM* data and reported offset transaction data supplied by U.S. prime defense contractors, the $8.4 billion in reported offset transactions during 2014-2016 for which Census publishes annual employment and value-added data by NAICS code (valued at $11.0 billion with the I/O multiplier applied), could have created or sustained 42,669 employment opportunities if the work associated with those transactions were performed in the United States. As shown in Table 4-5, the I/O accounts provides an approximation of the multiplier effect across all U.S. economic sectors had these transactions been performed in the United States.

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[21] The I/O accounts show the dollar value of inputs from all industries required to produce a dollar's worth of an industry's output. The I/O accounts provide an extensive accounting of the production of goods and services by each industry, which includes the goods and services purchased by each industry, the income earned in each industry, and the distribution of sales for all goods and services to industries and final uses.

[22] BIS's analysis to measure offset-related impact is based on three years of data which compensates for annual fluctuations. The basis for estimating the impact of offset activity on industrial activity and employment utilizes the NAICS codes data reported by Census and the I/O accounts.

[23] The multiplier effect in the I/O model occurs because the total inputs supplied to an industry sector consist of direct inputs (the product and services directly used in generating the output) supplied to that industry sector plus the indirect inputs (additional economic activities) created by the supplying industry sectors.

[24] Census' ASM data was not available for 2016. Consequently, 2013-2015 ASM data was used.

Table 4-5 also shows the net impact in inputs across all sectors of the U.S. economy resulting from offset-related defense export sales contracts. BIS derived this information by subtracting the reported offset transaction-related data from the reported defense export sales contracts-related data. The results indicate an overall net gain on U.S. manufacturing opportunities arising from export sales contracts with associated offset agreements, resulting in a positive $20.2 billion in added "input" opportunities for the U.S. industrial base, and a net gain of 65,499 in employment opportunities created or sustained during the 2014-2016 period. The 65,499 employment opportunities created or sustained during 2014-2016 represents an annual average of 21,833 for the three-year period. Also shown in Table 4-5 is the actual annual average employment in each product category provided in Census ASM data. As a caveat, as noted above, certain NAICS categories associated with offset-related export contracts and transactions are not included in the I/O data provided by BEA. Therefore, the net employment impact analysis may be slightly understated for both reported export sales contracts and reported offset transactions.

Table 4-5: Employment Opportunities Created or Sustained in Manufacturing Industry Sectors, 2014-2016			
Positive Economic Activities as Defined by Export Sales Contracts Benefiting U. S. Prime Contractors			
Export Sales Contracts in Manufacturing Industry Sectors	**Total Inputs**	**Value-added Output / Employee[25]**	**Employment Opportunities Created or Sustained**
Aircraft Manufacturing	$17,767,077,059	$383,717	46,303
Guided Missile and Space Vehicle Manufacturing	$5,386,110,628	$266,184[26]	20,235
Other Guided Missile and Space Vehicle Parts and Auxiliary Equipment Manufacturing	$2,752,795,370	$155,171[27]	17,740
Search, Detection, Navigation, Guidance, Aeronautical, and Nautical System and Instrument Manufacturing	$1,275,361,245	$259,611	4,913
Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing	$1,241,185,963	$230,228	5,391
Ammunition (Except Small Arms) Manufacturing	$817,194,148	$180,453	4,529
Other Commercial and Service Industry Machinery Manufacturing	$207,312,788	$197,685	1,049
Other Electronic Component Manufacturing	$84,008,628	$142,460	590
Other Aircraft Parts and Auxiliary Equipment Manufacturing	$71,114,326	$198,139	359
Aircraft Engine and Engine Parts Manufacturing	$9,225,603	$291,851	32
Other Manufacturing	$1,639,443,792	$233,240[28]	7,029
Total	**$31,250,829,549**		**108,168**

[25] This is an estimate. Value-added data from the Census' ASM was not available for 2016. Consequently, 2013-2015 ASM data was used.

[26] This is an estimate. Value-added data from the Census' ASM was withheld for 2013 and 2014 to avoid disclosing data for individual companies.

[27] This is an estimate. Value-added data from the Census' ASM was withheld for 2013 and 2014 to avoid disclosing data for individual companies.

[28] Weighted average of three industry sectors.

Table 4-5: Employment Opportunities Created or Sustained in Manufacturing Industry Sectors, 2014-2016 (Continued)			
Negative Economic Activities as Defined by Offset Transactions			
Offset Transactions Related to Manufacturing Industry Sectors	**Total Inputs**	**Value-added Output / Employee[29]**	**Employment Opportunities Created or Sustained**
Aircraft Manufacturing	$3,334,802,265	$383,717	8,691
Guided Missile and Space Vehicle Manufacturing	$629,800,162	$266,184[30]	2,366
Other Guided Missile and Space Vehicle Parts and Auxiliary Equipment Manufacturing	$99,171,854	$155,171[31]	639
Search, Detection, Navigation, Guidance, Aeronautical, and Nautical System and Instrument Manufacturing	$1,202,057,113	$259,611	4,630
Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing	$546,845,863	$230,228	2,375
Ammunition (Except Small Arms) Manufacturing	$20,876,938	$180,453	116
Other Commercial and Service Industry Machinery Manufacturing	$52,526,353	$197,685	266
Other Electronic Component Manufacturing	$46,260,217	$142,460	325
Other Aircraft Parts and Auxiliary Equipment Manufacturing	$3,336,762,259	$198,139	16,841
Aircraft Engine and Engine Parts Manufacturing	$1,151,175,387	$291,851	3,944
Other	$575,992,020	$233,240[32]	2,477
Total	**$10,996,270,430**		**42,669**

Table 4-5: Employment Opportunities Created or Sustained in Manufacturing Industry Sectors, 2014-2016 (Continued)

[29] This is an estimate. Value-added data from the Census' Annual Survey of Manufacturers (ASM) was not available for 2016. Consequently, 2013-2015 ASM data was used.

[30] This is an estimate. Value-added data from the Census' ASM was withheld for 2013 and 2014 to avoid disclosing data for individual companies.

[31] This is an estimate. Value-added data from the Census' ASM was withheld for 2013 and 2014 to avoid disclosing data for individual companies.

[32] Weighted average for three industry sectors.

Net Impact of Economic Impact from Export Sales Contracts and Offset Transactions					
Industry Sector	**Total Inputs**	**Value-added Output / Employee**[33]	**Net Employment Opportunities Created or Sustained**	**Annual Average Number of Net Employment Opportunities Created or Sustained, 2014-2016**	**Annual Average Number of Employees During 2013-2015**[34]
Aircraft Manufacturing	$14,432,274,793	$383,717	37,612	12,537	168,373
Guided Missile and Space Vehicle Manufacturing	$4,756,310,466	$266,184[35]	17,869	5,956	48,967
Other Guided Missile and Space Vehicle Parts and Auxiliary Equipment Manufacturing	$2,653,623,516	$155,171[36]	17,101	5,700	6,743
Search, Detection, Navigation, Guidance, Aeronautical, and Nautical System and Instrument Manufacturing	$73,304,132	$259,611	282	94	116,570
Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing	$694,340,099	$230,228	3,016	1,005	66,747
Ammunition (Except Small Arms) Manufacturing	$796,317,210	$180,453	4,413	1,471	9,735
Other Commercial and Service Industry Machinery Manufacturing	$154,786,435	$197,685	783	261	54,516
Other Electronic Component Manufacturing	$37,748,411	$142,460	265	88	47,836
Other Aircraft Parts and Auxiliary Equipment Manufacturing	-$3,265,647,933	$198,139	-16,482	-5,494	109,053
Aircraft Engine and Engine Parts Manufacturing	-$1,141,949,784	$291,851	-3,913	-1,304	78,058
Others (Military Armored Vehicle, Tank, and Tank Component Manufacturing, Small Arms, Ordnance, and Ordnance Accessories Manufacturing, and Ship Building and Repairing)	$1,063,451,772	$$233,240[37]	4,552	1,519	125,792
Total	**$20,254,559,119**		**65,499**	**21,833**	**832,390**
Sources: BIS Offset Database and BEA's *Benchmark Input-Output Accounts of the United States* Note: Due to rounding, totals may not add up exactly.					

Research and Development and Offset-Related Technology Transfer Trends

Comparing reported offset transactions involving technology transfer to total research and development (R&D) expenditures in the United States provides, for purposes of context, a

[33] This is an estimate. Value-added data from the Census' Annual Survey of Manufacturers (ASM) was not available for 2016. Consequently, 2013-2015 ASM data was used.

[34] Number of Employees data from Census' ASM was not available for 2016. Consequently, 2013-2015 data was used.

[35] This is an estimate. Value-added data from the Census' ASM was withheld for 2013 and 2014 to avoid disclosing data for individual companies.

[36] This is an estimate. Value-added data from the Census' ASM was withheld for 2013 and 2014 to avoid disclosing data for individual companies.

[37] Weighted average for three industry sectors.

measure of the magnitude of this type of offset activity. In Table 4-6, 2016 data is utilized to illustrate the relationship between the offset-related technology transfer and total U.S. research and development expenditures. As shown in Table 4-6, in 2016, the value of reported offset transactions that involved technology transfers was $156 million, equivalent to 0.03 percent of total R&D spending in the United States.[38]

Table 4-6: Trends in U.S. R&D Spending and Reported Offset Transactions Involving Technology Transfer, 2004-2016

Year	Reported Technology Transfer Offset Transactions	Total Private and Federal R&D Expenditures	Technology Transfer Transactions as a Percentage of R&D Spending
2004	$669,457,809	$304,500,000,000	0.22%
2005	$1,479,648,075	$327,200,000,000	0.45%
2006	$717,679,906	$352,900,000,000	0.20%
2007	$709,925,212	$380,000,000,000	0.19%
2008	$958,313,688	$404,773,000,000	0.24%
2009	$986,715,904	$402,931,000,000	0.24%
2010	$874,836,815	$406,580,000,000	0.22%
2011	$672,618,738	$426,160,000,000	0.16%
2012	$612,402,005	$433,619,000,000	0.14%
2013	$873,225,615	$453,964,000,000	0.19%
2014	$374,540,811	$475,426,000,000	0.08%
2015	$553,653,292	$495,144,000,000	0.11%
2016	$156,077,013	$509,967,000,000	0.03%

Sources: BIS Offset Database and the National Science Foundation, *National Center for Science and Engineering Statistics: National Patterns of R&D Resources: 2008-2016* Data Update, December 2017.

Note: Some data for 2015 are preliminary and may later be revised. The data for 2016 are estimates and will later be revised. The values shown are in current dollars.

BIS does not collect data from industry on the specific technologies transferred as a result of offset agreements and offset transactions. Regardless, any transfer of export-controlled technology must be approved through the U.S. Government's export licensing processes. The existence of an offset agreement does not allow companies to circumvent the established licensing processes managed by the Departments of Commerce and State, in consultation with DOD.

Domestic Defense Productive Capability

[38] This figure does not mean that U.S. industry lost 0.03 percent of its R&D spending in 2016. Rather, the number indicates that the actual value of offset transactions involving technology transfer was equivalent to 0.03 percent of domestic R&D spending.

Despite the capabilities that may accrue to foreign firms resulting from offset agreements signed with U.S. industry, purchases from foreign firms do not represent a significant share of DOD's total purchases. According to DOD data on its purchases from foreign entities, its procurement actions during Fiscal Year 2016 totaled approximately $298 billion, of which $10.7 billion or 3.6 percent was expended on purchases from foreign entities. Defense equipment constituted approximately 15 percent of the purchases from foreign entities. Fuel, services, construction, and subsistence accounted for 77 percent, with the remaining eight percent covering a variety of other categories.[39]

See Annex D for an overview of DOD's Fiscal Year 2016 purchases from foreign entities by claimant programs.

[39] See Office of the Under Secretary of Defense (Acquisition, Technology, and Logistics), *Report to Congress – Department of Defense Fiscal Year 2016 Purchases from Foreign Entities*, June 2017.

5 Utilization of Annual Report

The data contained in this annual report is considered and utilized by BIS and other representatives of the United States during discussions with foreign governments on offsets in defense trade. For instance, BIS discussed offsets with representatives from the European Commission (EC) in 2017. These discussions included both BIS and the EC providing updates on their activities related to offsets in defense trade.

In 2016, U.S. firms reported entering into six new offset agreements with two members of the European Union (EU) valued at $89.9 million. These six agreements accounted for 18.18 percent of the new offset agreements reported by U.S. firms in 2016 based on quantity and 6.03 percent based on offset agreement value. In 2016, U.S. firms reported 137 offset transactions with EU members with an actual value of $232.7 million, and an offset credit value of $457.9 million. The EU members accounted for 26.97 percent of all offset transactions reported by U.S. firms in 2016 based on quantity and for 8.83 percent of the overall offset transaction value.

Annex A (Not For Public Release)

Annex B (Not For Public Release)

Annex C – Overview of Offset Transactions by Category and/or Type, 1993-2016

Table C-1: Offset Transactions by Type							
Year	**Total**	**Direct**	**Indirect**	**Unspecified**	**Direct**	**Indirect**	**Unspecified**
	Actual Value ($ millions)				**% Distribution**		
1993	$1,898	$637	$1,197	$64	33.55%	63.09%	3.36%
1994	$1,935	$628	$1,202	$104	32.47%	62.14%	5.39%
1995	$2,890	$1,109	$1,757	$25	38.36%	60.78%	0.86%
1996	$2,876	$1,249	$1,626	$1	43.42%	56.53%	0.05%
1997	$2,721	$1,042	$1,658	$21	38.29%	60.93%	0.79%
1998	$2,312	$1,470	$842	$0	63.56%	36.43%	0.01%
1999	$2,060	$700	$1,349	$11	33.97%	65.47%	0.55%
2000	$2,190	$767	$1,412	$11	35.04%	64.48%	0.49%
2001	$2,543	$928	$1,615	-	36.49%	63.51%	-
2002	$2,620	$958	$1,660	$1	36.58%	63.37%	0.05%
2003	$3,563	$1,110	$2,447	$6	31.17%	68.68%	0.16%
2004	$4,935	$2,536	$2,398	$1	51.39%	48.60%	0.01%
2005	$4,722	$1,798	$2,924	-	38.07%	61.93%	-
2006	$4,706	$1,689	$2,999	$18	35.89%	63.72%	0.39%
2007	$3,805	$1,890	$1,906	$9	49.68%	50.09%	0.23%
2008	$3,291	$1,571	$1,719	$1	47.74%	52.24%	0.02%
2009	$3,495	$1,299	$2,191	$5	37.17%	62.68%	0.15%
2010	$3,608	$1,194	$2,277	$137	33.10%	63.11%	3.80%
2011	$3,880	$1,907	$1,899	$74	49.14%	48.95%	1.91%
2012	$3,438	$1,188	$1,635	$615	34.56%	47.56%	17.88%
2013	$3,189	$1,088	$2,086	$15	34.13%	65.41%	0.46%
2014	$3,864	$990	$2,867	$7	25.63%	74.20%	0.17%
2015	$5,049	$2,113	$2,648	$289	41.84%	52.44%	5.72%
2016	$2,634	$905	$1,728	$1	34.36%	65.62%	0.03%
Total or Average	**$78,222**	**$30,765**	**$46,042**	**$1,415**	**38.98%**	**59.25%**	**1.93%**
	Credit Value ($ millions)				**% Distribution**		
1993	$2,214	$737	$1,408	$69	33.31%	63.59%	3.10%
1994	$2,206	$802	$1,295	$109	36.38%	58.69%	4.93%
1995	$3,593	$1,303	$2,251	$39	36.26%	62.65%	1.09%
1996	$3,098	$1,182	$1,880	$36	38.15%	60.68%	1.16%
1997	$3,272	$1,183	$2,039	$50	36.17%	62.31%	1.52%
1998	$2,623	$1,629	$991	$3	62.11%	37.79%	0.10%
1999	$2,808	$1,134	$1,604	$70	40.38%	57.12%	2.50%
2000	$2,749	$1,049	$1,689	$11	38.16%	61.45%	0.39%
2001	$3,201	$1,219	$1,982	-	38.08%	61.92%	-
2002	$3,148	$1,128	$2,019	$1	35.83%	64.13%	0.04%
2003	$4,008	$1,213	$2,783	$12	30.26%	69.44%	0.30%
2004	$5,366	$2,665	$2,700	$1	49.66%	50.33%	0.01%
2005	$5,439	$1,871	$3,568	-	34.40%	65.60%	-
2006	$4,906	$1,635	$3,258	$14	33.32%	66.40%	0.28%
2007	$4,742	$2,499	$2,226	$17	52.70%	46.95%	0.35%
2008	$4,768	$2,756	$2,009	$3	57.79%	42.14%	0.07%
2009	$4,129	$1,645	$2,478	$5	39.84%	60.03%	0.13%
2010	$4,477	$1,799	$2,639	$39	40.18%	58.94%	0.87%
2011	$5,062	$2,789	$2,198	$74	55.11%	43.43%	1.46%
2012	$3,843	$1,301	$1,674	$868	33.85%	43.57%	22.58%
2013	$3,563	$1,329	$2,219	$15	37.29%	62.29%	0.42%
2014	$4,289	$1,143	$3,133	$13	26.65%	73.04%	0.31%
2015	$5,323	$2,221	$2,809	$293	41.73%	52.76%	5.50%
2016	$3,064	$1,118	$1,945	$1	36.49%	63.49%	0.02%
Total or Average	**$91,890**	**$37,350**	**$52,798**	**$1,742**	**40.17%**	**57.86%**	**2.14%**

Source: BIS Offset Database

Note: Due to rounding, totals may not add up exactly. Figures for certain previous years have been revised. The values shown have not been adjusted for inflation.

Table C-2: Number of Offset Transactions by Type and with Multipliers, 1993 – 2016						
Year	Number of Transactions				Transactions with Multipliers Greater than 1	
	Total	Direct	Indirect	Unspecified	Number of Transactions	Percent of Total Transactions
1993	444	160	280	4	66	14.86%
1994	566	178	383	5	83	14.66%
1995	711	204	505	2	110	15.47%
1996	634	228	404	2	64	10.09%
1997	578	202	372	4	61	10.55%
1998	582	241	340	1	87	14.95%
1999	513	212	296	5	87	16.96%
2000	626	215	409	2	82	13.10%
2001	616	223	393	0	113	18.34%
2002	734	200	533	1	83	11.31%
2003	689	179	506	4	64	9.29%
2004	710	375	334	1	74	10.42%
2005	624	210	414	0	52	8.33%
2006	661	288	371	2	33	4.99%
2007	633	294	337	2	88	13.90%
2008	671	226	443	2	73	10.88%
2009	702	261	440	1	112	15.95%
2010	707	210	496	1	114	16.12%
2011	740	256	467	17	77	10.41%
2012	690	213	402	75	73	10.58%
2013	546	191	354	1	45	8.24%
2014	672	180	488	4	75	11.16%
2015	651	205	444	2	44	6.76%
2016	508	154	353	1	59	11.61%
Total or Average	**15,208**	**5,305**	**9,764**	**139**	**1,819**	**11.96%**

Source: BIS Offset Database
Note: Because of rounding, totals may not add up exactly. Figures for certain previous years have been revised.

Table C-3: Number of Offset Transactions by Category and Type and with Multipliers, 1993 – 2016					
Transaction Category	**Total**	**Direct**	**Indirect**	**Unspecified**	**Multipliers Greater than 1**
Purchasing	7,086	161	6,917	8	518
Subcontracting	3,536	3,065	468	3	316
Technology Transfer	1,703	801	880	22	386
Co-production	580	567	9	4	29
Training	447	199	239	9	152
Investment	351	46	299	6	109
Licensed Production	297	192	103	2	26
Credit Assistance	170	15	155	0	28
Other	1,038	259	694	85	255
Total	**15,208**	**5,305**	**9,764**	**139**	**1,819**
Source: BIS Offset Database					

Table C-4: Offset Transactions by Category, Type, and Value, 1993-2016								
Transaction Category	**Actual Values ($ millions)**				**Percent by Column Total**			
	Total	**Dir.**	**Ind.**	**Unsp.**	**Total**	**Dir.**	**Ind.**	**Unsp.**
Purchasing	$30,474	$1,531	$28,907	$36	38.96%	4.98%	62.79%	2.57%
Subcontracting	$15,588	$14,446	$1,128	$13	19.93%	46.96%	2.45%	0.94%
Technology Transfer	$13,693	$6,872	$6,515	$306	17.51%	22.34%	14.15%	21.59%
Co-production	$3,837	$3,784	$11	$42	4.91%	12.30%	0.02%	2.95%
Licensed Production	$2,365	$1,314	$1,027	$24	3.02%	4.27%	2.23%	1.70%
Investment	$2,306	$478	$1,737	$91	2.95%	1.55%	3.77%	6.41%
Credit Assistance	2,083	$221	$1,861	-	2.66%	0.72%	4.04%	-
Training	$1,950	$714	$1,231	$5	2.49%	2.32%	2.67%	0.34%
Other	$5,924	$1,404	$3,621	$899	7.58%	4.56%	7.87%	63.50%
Total	**$78,222**	**$30,765**	**$46,042**	**$1,415**	**100.00%**	**100.00%**	**100.00%**	**100.00%**
Transaction Category	**Credit Values ($ millions)**				**Percent by Column Total**			
	Total	**Dir.**	**Ind.**	**Unsp.**	**Total**	**Dir.**	**Ind.**	**Unsp.**
Purchasing	$32,291	$1,560	$30,688	$43	35.15%	4.18%	58.14%	2.47%
Subcontracting	$17,597	$16,323	$1,260	$13	19.15%	43.70%	2.39%	0.77%
Technology Transfer	$16,512	$8,048	$8,228	$236	17.97%	21.55%	15.59%	13.55%
Co-production	$4,462	$4,409	$11	$42	4.86%	11.80%	0.02%	2.40%
Licensed Production	$2,897	$1,646	$1,220	$31	3.15%	4.41%	2.31%	1.79%
Investment	$3,924	$855	$2,927	$141	4.27%	2.29%	5.55%	8.12%
Credit Assistance	$2,364	$301	$2,063	-	2.57%	0.81%	3.91%	-
Training	$3,206	$1,519	$1,668	$18	3.49%	4.07%	3.16%	1.04%
Other	$8,639	$2,689	$4,733	$1,217	9.40%	7.20%	8.97%	69.87%
Total	**$91,890**	**$37,350**	**$52,798**	**$1,742**	**100.00%**	**100.00%**	**100.00%**	**100.00%**

Source: BIS Offset Database
Note: Due to rounding, totals may not add up precisely. The values shown have not been adjusted for inflation.

Table C-5: Offset Transactions by Category ($ thousands)

Year	Co-Production			Credit Assistance			Investment			Licensed Production			Purchase		
	Actual Value	Credit Value	Total Number	Actual Value	Credit Value	Total Number	Actual Value	Credit Value	Total Number	Actual Value	Credit Value	Total Number	Actual Value	Credit Value	Total Number
1993	$35,550	$35,550	6	$340,492	$366,794	12	$41,499	$41,500	13	$37,851	$41,451	8	$703,850	$865,524	226
1994	$111,895	$112,185	10	$3,494	$21,639	3	$93,265	$98,474	17	$45,424	$67,629	15	$694,506	$735,909	288
1995	$86,898	$86,898	11	$374,248	$468,930	20	$117,152	$363,556	9	$5,110	$4,965	2	$863,425 $197,760	$932,133 $295,647	367
1996	$16,952	$22,052	3	$244,270	$258,970	15	$10,656	$10,656	2	$26,425	$26,425	1	$1,090,104	$1,116,434	298
1997	$28,339	$28,339	22	$168,410	$168,410	20	$85,126	$271,538	6	$0	$0	0	$837,071	$894,517	245
1998	$94,332	$98,283	30	$43,920	$43,920	4	$0	$0	0	$0	$0	0	$582,198	$595,910	253
1999	$47,803	$47,803	19	$16,888	$16,888	3	$28,475	$219,079	9	$460	$23,000	2	$869,591	$883,930	203
2000	$27,691	$27,691	15	$9,952	$9,952	2	$52,343	$69,621	7	$9,816	$9,816	1	$840,845	$915,622	299
2001	$16,575	$80,300	2	$4,726	$8,027	3	$59,933	$72,945	7	$25,000	$25,000	1	$1,132,958	$1,250,367	331
2002	$0	$0	0	$29,453	$29,453	1	$24,484	$85,234	12	$0	$0	0	$1,289,790	$1,537,001	452
2003	$260,250	$266,465	18	$51,610	$51,610	6	$172,683	$226,215	13	$1,500	$0	1	$1,790,932	$1,835,692	422
2004	$1,395,766	$1,268,666	105	$141,234	$170,453	20	$162,077	$393,819	15	$13,679	$13,679	3	$1,351,878	$1,463,620	213
2005	$309,409	$322,204	74	$61,028	$76,828	10	$185,819	$192,387	19	$123,836	$268,326	5	$1,975,390	$2,393,048	286
2006	$383,587	$432,089	93	$442,028	$453,521	28	$118,733	$124,593	17	$62,000	$64,000	3	$2,029,212	$2,280,352	252
2007	$398,250	$496,255	83	$76,997	$84,164	8	$106,953	$158,986	21	$2,972	$2,972	1	$916,823	$963,306	219
2008	$243,888	$519,084	51	$41,641	$54,171	5	$116,063	$168,033	22	$10,393	$10,393	2	$940,543	$956,295	327
2009	$107,080	$107,080	13	$6,377	$6,377	3	$111,923	$160,883	17	$207,742	$214,696	43	$1,469,915	$1,501,925	333
2010	$148,300	$237,583	2	$8,745	$19,700	2	$185,338	$306,236	25	$380,277	$398,213	45	$1,236,751	$1,307,767	380
2011	$13,943	$13,943	3	$0	$0	0	$112,643	$272,628	35	$307,095	$535,101	56	$1,539,704	$1,512,310	382
2012	$58,304	$58,304	12	$15,872	$30,872	3	$43,226	$43,226	7	$308,339	$308,339	34	$978,762	$956,765	228
2013	$1,999	$1,999	5	$0	$0	0	$77,457	$83,457	13	$261,835	$347,618	31	$945,762	$937,560	215
2014	$432	$432	1	$0	$0	0	$201,418	$307,478	30	$259,362	$259,362	26	$2,362,465	$2,426,634	327
2015	$0	$0	0	$0	$0	0	$134,147	$139,614	21	$159,817	$159,817	9	$2,873,731	$2,887,585	312
2016	$50,016	$198,366	2	$18,084	$140,806	6	$64,110	$113,918	14	$115,734	$115,734	8	$1,157,658	$1,140,499	228

Source: BIS Offset Database
Note: Figures for certain previous years have been revised. The values shown have not been adjusted for inflation.

Table C-5: Offset Transactions by Category ($ thousands) (continued)

Year	Subcontracting			Technology Transfer			Training			All Others		
	Actual Value	Credit Value	Total Number	Actual Value	Credit Value	Total Number	Actual Value	Credit Value	Total Number	Actual Value	Credit Value	Total Number
1993	$336,368	$405,101	109	$300,307	$320,504	32	$50,994	$69,027	21	$50,967	$68,168	17
1994	$267,518	$319,081	95	$462,569	$495,849	68	$107,448	$191,956	34	$148,742	$163,370	36
1995	$830,419	$887,985	147	$334,328	$395,024	71	$81,146	$157,453	33	$197,760	$295,647	51
1996	$721,298	$733,511	175	$476,657	$426,849	60	$176,196	$245,478	38	$113,266	$257,647	42
1997	$848,489	$868,412	141	$289,527	$492,451	67	$9,460	$61,636	13	$454,159	$487,010	64
1998	$1,215,476	$1,244,506	164	$196,765	$413,335	63	$34,929	$70,007	14	$144,550	$157,246	54
1999	$452,464	$476,331	140	$336,018	$396,856	69	$4,330	$31,370	3	$303,704	$713,077	65
2000	$583,874	$774,278	149	$293,377	$430,962	76	$68,887	$123,299	27	$302,950	$388,093	50
2001	$707,069	$863,615	154	$529,343	$788,885	89	$18,427	$28,710	15	$48,656	$82,960	14
2002	$826,348	$929,994	163	$287,465	$383,076	66	$26,344	$33,004	12	$135,848	$149,847	28
2003	$506,058	$602,288	101	$547,446	$563,306	75	$87,170	$165,247	19	$145,262	$297,232	34
2004	$848,650	$849,886	207	$669,458	$782,957	85	$140,524	$148,739	29	$211,266	$273,924	33
2005	$485,233	$508,445	91	$1,479,648	$1,504,264	100	$6,473	$21,167	5	$95,146	$152,360	34
2006	$690,033	$690,033	150	$717,680	$637,598	75	$88,558	$87,265	14	$174,010	$136,966	29
2007	$879,561	$921,161	169	$709,925	$905,483	56	$50,120	$162,998	12	$662,926	$1,046,377	64
2008	$680,119	$863,793	121	$958,314	$1,462,126	86	$73,283	$108,226	13	$226,486	$626,110	44
2009	$472,836	$698,370	140	$986,716	$1,120,309	109	$14,571	$76,325	13	$118,210	$242,668	31
2010	$605,563	$825,264	124	$874,837	$1,076,516	76	$52,207	$83,329	15	$116,107	$222,297	38
2011	$979,598	$1,198,649	136	$672,619	$866,470	80	$88,878	$483,351	21	$165,737	$179,051	27
2012	$466,270	$563,589	231	$612,402	$665,508	68	$200,111	$201,488	27	$754,223	$1,015,158	80
2013	$754,136	$797,242	154	$873,226	$1,050,304	88	$159,208	$218,132	23	$115,434	$126,582	17
2014	$374,218	$455,199	184	$374,541	$476,202	50	$110,628	$127,708	12	$180,795	$236,431	42
2015	$439,261	$489,719	162	$553,653	$650,066	45	$262,695	$267,317	19	$626,059	$729,059	83
2016	$617,096	$630,255	129	$156,077	$206,882	49	$37,660	$42,729	15	$375,131	$432,081	49

Source: BIS Offset Database
Note: Figures for certain previous years have been revised. The values shown have not been adjusted for inflation.

Annex D - (Not For Public Release)

Annex E - (Not For Public Release)

Annex F – Department of Defense's Foreign Purchases by Category and Total Obligation, Fiscal Year 2016

DOD Claimant Program	Foreign Purchases (Dollars)
Services	$2,990,690,387
Petroleum	$2,240,023,257
Construction	$2,219,504,515
All Others Not Identifiable to Any Other	$786,709,069
Subsistence	$742,602,729
Other Aircraft Equipment	$316,979,521
Ships	$295,460,961
Electronics and Communication Equipment	$244,822,624
Airframes and Spares	$243,306,165
Combat Vehicles	$132,782,083
Ammunition	$103,122,220
Weapons	$100,044,895
Aircraft Engines and Spares	$63,024,594
Missile and Space Systems	$59,647,816
Non-Combat Vehicles	$43,761,629
Medical and Dental Supplies and Equipment	$21,969,863
Other Fuels and Lubricants	$14,623,073
Material Handling Equipment	$11,658,657
Building Supplies	$7,154,549
Construction Equipment	$5,516,852
Textiles, Clothing and Equipage	$5,013,795
Production Equipment	$3,209,810
Separately Procured Containers and Handling Equipment	$306,422
Transportation Equipment (Railway)	$137,967
Photographic Equipment and Supplies	$37,836
Miscellaneous	($205,311)
Total	**$10,651,905,997**
Source: Office of the Under Secretary of Defense (Acquisition, Technology, and Logistics), *Report to Congress – Department of Defense Fiscal Year 2016 Purchases from Foreign Entities*, June 2017.	

Annex G – Glossary and Offset Example

Actual Value of Offset Transactions: The U.S. dollar value of the offset transaction without taking into account multipliers or intangible factors.

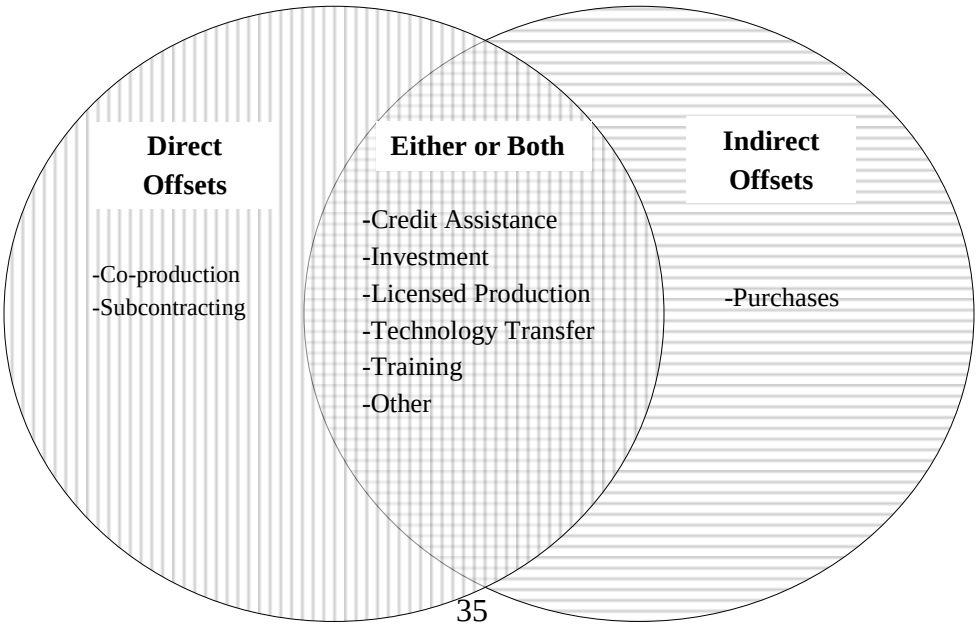
Co-production: Transactions that are based upon government-to-government agreements authorizing the transfer of technology to permit foreign companies to manufacture all or part of U.S.-origin defense articles. Such transactions are based upon an agreement specifically referenced in Foreign Military Sales (FMS) Letters of Offer and Acceptance (LOA) and a government-to-government Memorandum of Understanding (MOU). Co-production is always classified as a direct offset.

Credit Assistance: Credit assistance includes direct loans, brokered loans, loan guarantees, assistance in achieving favorable payment terms, credit extensions, and lower interest rates. Credit assistance specifically excludes the use of "banked" offset credits (credits that exceed the requirement of the offset agreement and are permitted, by the terms of the agreement, to be applied to future offset obligations). Credit assistance is nearly always classified as an indirect offset transaction but can also be direct.

Credit Value of Offset Transactions: The U.S. dollar value credited for the offset transaction by application of a multiplier, any intangible factors, or other methods. The credit value may be greater than, equal to, or less than the actual value of the offset.

Direct Offsets: An offset transaction directly related to the article(s) or service(s) exported or to be exported pursuant to the military export sales agreement. The diagram below illustrates how each category may be classified as direct and/or indirect offsets.

Indirect Offsets: An offset transaction unrelated to the article(s) or service(s) exported or to be exported pursuant to the military export sales agreement. The diagram below illustrates how each category may be classified as direct and/or indirect offsets.



Investment: Investment arising from an offset agreement, often taking the form of capital dedicated to the establishment of a foreign entity unrelated to the defense sale or to expanding the U.S. firm's subsidiary or joint venture in the foreign country. Investment can be either a direct or indirect offset.

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. Licensed production is not pursuant to a co-production government-to-government MOU. In addition, licensed production almost always involves a part or component for a defense system, rather than a complete defense system. Licensed production transactions can be either direct or indirect offsets.

Multiplier: A factor applied to the actual value of certain offset transactions to calculate the credit value earned. Foreign purchasers use multipliers to provide firms with incentives to offer offsets that benefit targeted areas of economic growth. When a "positive" multiplier is applied to the price of a service or product offered as an offset, the defense firm receives a higher credit value toward fulfillment of an offset obligation than would be the case without application of a multiplier. Conversely, foreign purchasers apply "negative" multipliers to discourage certain types of transactions not thought to be in the best economic interest of the receiving entity.

> Example: A foreign government interested in a specific technology may offer a multiplier of "six" for offset transactions providing access to that technology. A U.S. defense company with a 120 percent offset obligation from a $1 million sale of defense systems ordinarily would be required to provide technology transfer through an offset equaling $1.2 million. With a multiplier of six, however, the U.S. company could offer only $200,000 (actual value) in technology transfer and earn $1.2 million in credit value, fulfilling its entire offset obligation under the agreement.

Offset Agreement: Any offset as defined under "offsets" that the U.S. firm agrees to in order to conclude a military export sales contract. This includes all offsets, whether they are "best effort" agreements or are subject to penalty clauses.

Offset Transaction: Any activity for which the U.S. firm claims credit for full or partial fulfillment of the offset agreement. Activities to implement offset agreements are categorized as co-production, technology transfer, subcontracting, credit assistance, training, licensed production, investment, purchases, and other.

Offsets: Compensation practices required as a condition of purchase in either government-to-government or commercial sales of: (1) 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); or (2) Items controlled under an Export Control Classification Number (ECCN) that has the numeral ''6'' as its third character in the Commerce Control List found in Supplement No. 1 to part 774 of this chapter other than semisubmersible and submersible vessels specially designed for cargo transport and parts, components, accessories and attachments specially designed therefor controlled under ECCN 8A620.b; test,

inspection and production equipment controlled in ECCN 8B620.b, software controlled in ECCN 8D620.b and technology controlled in ECCN 8E620.b.

Other: An offset transaction other than co-production, credit assistance, licensed production, investment, purchases, subcontracting, technology transfer, or training.

Purchases: Purchases involve the procurement of off-the-shelf items from the offset recipient. Purchases are indirect offset transactions.

Subcontracting: In the offset context, subcontracting is the overseas production of a part or component of a U.S.-origin defense article. The subcontract does not necessarily involve license of technical information. Instead, it is usually a direct commercial arrangement between the defense prime contractor and a foreign producer.

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.

Training: Generally includes training related to the production or maintenance of the exported defense item. Training, which can be either direct or indirect offset, may be required in unrelated areas, such as computer training, foreign language skills, or engineering capabilities.

OFFSET EXAMPLE

This example is for illustrative purposes only and in no way represents an actual offset agreement. Nation A purchased ten KS-340 jet fighters from a U.S. defense firm, Company B, for a total of $500 million with a related 100 percent offset agreement. In other words, the offset agreement obligated Company B to fulfill offsets equal to the value of the contract, or $500 million. The government of Nation A decided what would be required of Company B in order to fulfill its offset obligation, which would include both direct and indirect offsets. The government also assigned the credit value for each category.

<u>Direct Offsets (i.e., related to the production of the export item, the KS-340 jet fighter)</u>

Technology Transfer: The technology transfer requirement was assigned 36 percent of the total offset obligation. Company B agreed to transfer all the necessary technology and know-how to firms in Nation A in order to repair and maintain the jet fighters. The government of Nation A deemed this capability to be vital to national security and, therefore, gave a multiplier of six. As a result, the transfer of technology actually worth $30 million was given a credit value of $180 million.

Licensed Production: Firms from Nation A manufactured some components of the KS-340 jet fighters, totaling $240 million, which accounted for 48 percent of the offset obligation. There was no multiplier associated with this activity.

Indirect Offsets (i.e., not related to the production of the export item, the KS-340 jet fighter)

Purchase: Company B purchased marble statues from manufacturers from Nation A for eventual resale. These purchases accounted for nine percent of the offset obligation, or $45 million. There was no multiplier associated with this activity.

Technology Transfer: Company B provided submarine technology to firms from Nation A, which accounted for seven percent of the offset obligation, or $35 million. There was no multiplier associated with this activity.