A Technical Analysis of the **Economic Impact** of U.S. Department of Defense **Contracts in Indiana**

ANALYSIS BY

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Defense Contracts in the US

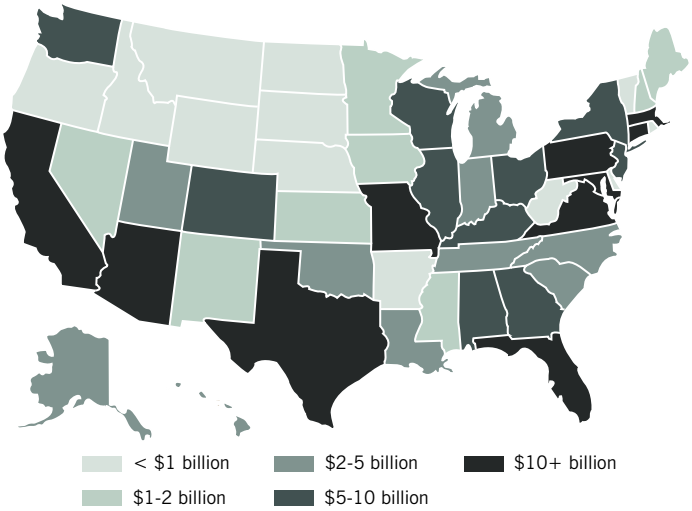
The largest portion of U.S. federal government budget spending, is allocated to the Department of Defense (DoD) in the form of contract awards. The majority of DoD contracts are awarded by DoD field organizations to vendors throughout the country. The top five state recipients of DoD contract awards to firms in 2010 were Virginia, California, Texas, Maryland, and Florida. A state ranking of DoD contract values places Indiana in the second-tier among DoD contractors. In 2009[1], Indiana ranked 17th among U.S. states by total contracts value. In 2010, Indiana's rank fell to the 23rd as a result of sharp decrease in contract values, totalling $2.7 million. See Table 1.

TABLE 1 - **RANK & SHARE OF DEFENSE CONTRACTS AMONG US STATES**

FISCAL YEAR 2009				FISCAL YEAR 2010			
	State	*Contract Value ($billion)*	*% of Total Contracts*		*State*	*Contract Value ($billion)*	*% of Total Contracts*
1	Virginia	53.3	14.15	1	Virginia	54.1	15.82
2	California	46.1	12.18	2	California	42.9	12.56
3	Texas	28.6	7.56	3	Texas	35.1	10.28
4	Maryland	17.3	4.58	4	Maryland	15.2	4.45
5	Massachusetts	15.1	4.00	5	Florida	14.4	4.21
6	Florida	14.4	3.80	6	Massachusetts	13.9	4.07
7	Arizona	12.5	3.31	7	Arizona	11.7	3.42
8	Connecticut	12.1	3.21	8	Connecticut	11.1	3.26
9	Missouri	11.8	3.12	9	Missouri	10.9	3.19
10	Pennsylvania	10.1	2.67	10	Pennsylvania	10.4	3.05
17	**Indiana**	**6.7**	**1.78**	**23**	**Indiana**	**4.0**	**1.17**

SOURCE: USA Spending data feed/archives, *www.usaspending.gov*

FIGURE 1 - **DISTRIBUTION OF DEFENSE CONTRACTS BY CONTRACT VALUE, 2010**



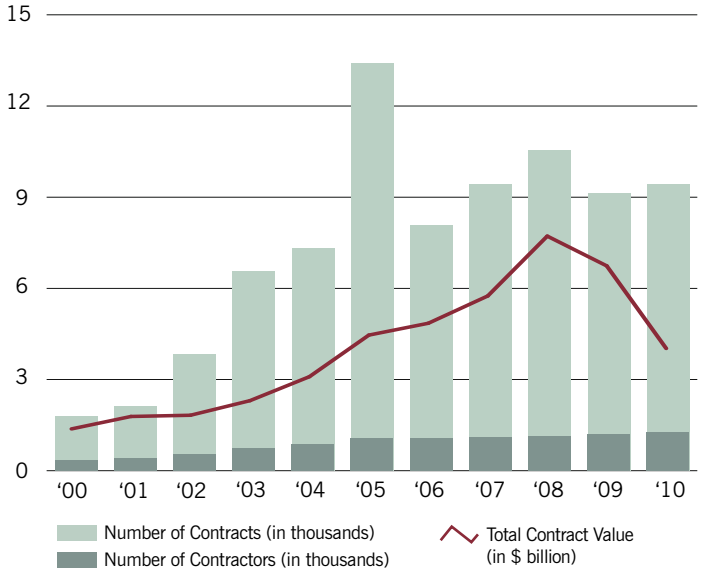
SOURCE: USA Spending data feed/archives, *www.usaspending.gov*

Figure 1 illustrates the spatial distribution of DoD contracts in 2010 nationwide. The highest ranked recipients are coastal states on the east, south and west, while the central and northern states (with the exception of Washington) have the lowest amounts of DoD contracts. This factor could be determined by the presence of specialized industries, the products and services states' vendors offer, and the presence of military bases.[2]

Each top ten state received contracts totalling more than $10 billion; three of these states—Virginia, California and Texas— had contracts valued at more than $30 billion. Indiana secured $4 billion in DoD contracts in 2010.

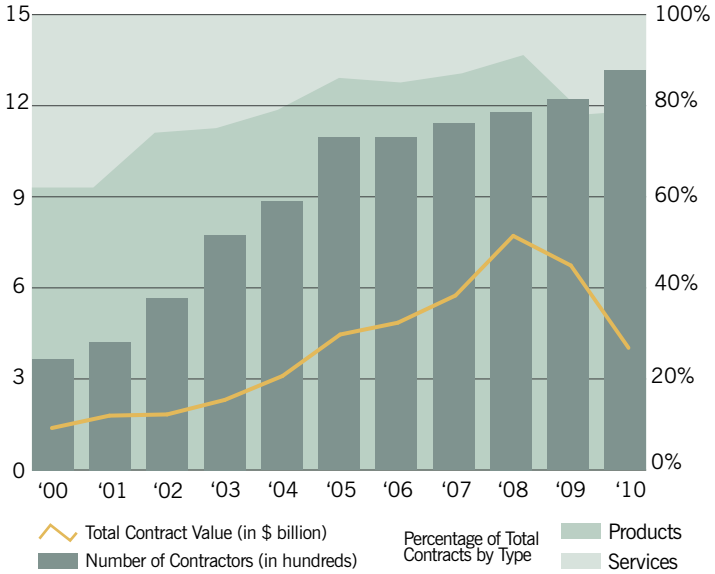
[1]*The year indicates the U.S. fiscal year, which has a cycle from October 1 of the previous year to September 30 of the analyzed year.*
[2]*All top ten states have at least one or more military installations.*

FIGURE 2 - **TREND OF CONTRACTS ALLOCATED IN INDIANA, 2000-2010**



SOURCE: USA Spending data feed/archives, *www.usaspending.gov*

FIGURE 3 - **PRODUCTS & SERVICES BY INDIANA VENDORS, 2000-2010**



SOURCE: USA Spending data feed/archives, *www.usaspending.gov*

Defense Contracts in Indiana

Overview

Prior to 2008, DoD contract values had gradually increased in Indiana; the numbers of contracts and contractors were also increasing. This increase can be seen in Figure 2. However, total contract values began to decrease in 2009, first by 13 perecent and in 2010, 40 percent. As a result, total contract values in Indiana by 2010 returned to 2004-2005 levels. The number of contracts also saw growth, with the exception of 2006 and 2009. At the same time, the number of contractors steadily increased. This may suggest many contractors still received contracts, but the average contract value per contractor steadily decreased.

Products and Services

The trend in contract values for products produced and services provided by Indiana vendors is shown in Figure 3. There was a steady increase in contract value for the products contracts prior to 2008, followed by its rapid decrease in contract values in 2009 and 2010. Contract values for services relatively stayed stable, with the exception of a decrease in 2009, due to a contract loss of $75 million.

Total DoD contract values in Indiana in 2010 were divided among products, 79 percent, and services, 21 percent. This compares to 62 percent in products and 38 percent in services in 2000. It could be noted from this trend that Indiana's defense contracts are primarily focused on product manufacturing in terms of contract value instead of service-based industries.

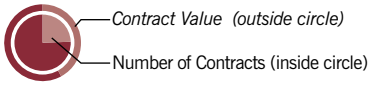
Although Indiana received a total of $4 billion in DoD contracts in 2010, this follows a two-year decline in contract values. Specifically, DoD contract values in Indiana for products decreased 40 percent ($1.73 billion) between 2008 and 2009 and 25 percent ($2.09 billion) between 2009 and 2010. On the contrary, contract values for services by Indiana vendors increased, with the exception of 2008. Additionally, the total number of contractors increased three percent and seven percent in 2009 and 2010 respectively.

Top 10 Products and Services for 2010

Figure 4.A shows the top ten products produced in Indiana via DoD contracts in 2010. The largest share belongs to truck manufacturing valued at $570 million, nearly 18 percent of the total contract value of products produced in Indiana. This is followed by radio and telecommunication equipment ($399 million, 12.5 percent share), combat assault and tactical vehicle ($329 million, 10.3 percent share), gas turbines and jet engines aircraft and components ($287 million, nine percent share). The bottom five product types make up less than five percent of the total and represent different components for aircraft and engines, fuel oils, radio navigation equipment.

Among the top ten services represented in Figure 4.B, the largest share of contract values were to engine and turbine maintenance/repair. These areas has a total contract value of $110 million and

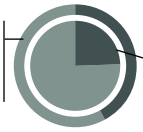
FIGURE 4 - **TOP 10 PRODUCTS & SERVICES PRODUCED IN INDIANA, 2010**



A. PRODUCTS

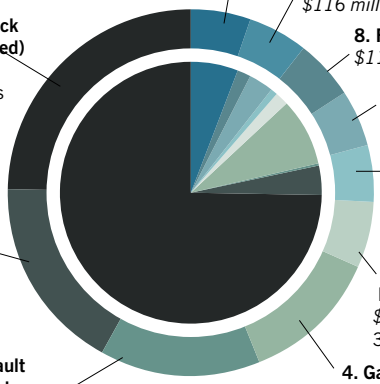
In 2010, there were a total of **8,165** defense product contracts with a total value of **$3.192 billion.**

6,153 of these contracts were other products, produced totaling **$872 million** .



2,012 of these contracts were of the Top 10 products, produced totaling **$2.32 billion.**

TOP 10 PRODUCTS



10. Radio Navigation-Airborne
$115 million | 14 contracts

9. Diesel Engines & Components
$116 million | 59 contracts

8. Fuel Oils
$119 million |44 contracts

7. Aircraft-Rotary Wings *$123 million*
2 contracts

6. Misc. Aircraft Accessories & Components *$128 million*
120 contracts

5. Liquid Propellants & Fuels (petroleum based)
$134 million
35 contracts

4. Gas Turbines & Aircraft Jet Engines
$287 million
170 contracts

3. Combat Assault & Tactical Vehicles (wheeled)
$329 million | 2 contracts

2. Radio & TV Communication Equipment (except airborne)
$399 million
74 contracts

1. Trucks & Truck Tractors (wheeled)
$570 million
1,492 contracts

SOURCE: USA Spending data feed/archives, *www.usaspending.gov*

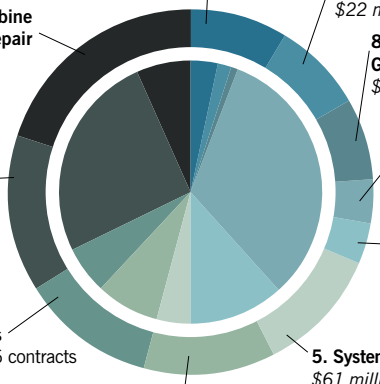
B. SERVICES

In 2010, there were a total of **280** defense service contracts with a total value of **$826 million.**

1,273 of these contracts were other products, produced totaling **$270 million**.

280 of these contracts were of the Top 10 products, produced totaling **$556 million.**

TOP 10 SERVICES



10. Construction of Facilities & Structures
$21 million | 32 contracts

9. Maintenance & Repair of Real Estate, Misc. Buildings
$22 million | 91 contracts

8. Modification of Guided Missiles
$40 million | 3 contracts

7. Defense Electronics & Communication Equipment- R&D
$44 million
4 contracts

6. Commercial Aircraft R&D
$49 million
10 contracts

5. Systems Engineering
$61 million | 12 contracts

4. Defense Aircraft R&D
$65 million | 22 contracts

3. Logistics Support Services
$66 million | 16 contracts

2. Engineering & Technical Services
$78 million
72 contracts

1. Engine & Turbine Maintenance/Repair
$110 million
18 contracts

SOURCE: USA Spending data feed/archives, *www.usaspending.gov*

13.4 percent share of all services provided by Indiana vendors. Additional services included engineering and technical services ($78 million and 9.4 percent share), logistics support services ($66 million and eight percent share), defense aircraft, applied research and exploratory development ($65 million and 7.8 percent) and systems engineering services ($61 million and 7.4 percent). See Figure 4.B.

Indiana's Role: Detailed Account of Defense Contracts

Contracts by Industry

An overview of contracts by industry sector provides a glimpse of Indiana's defense industry related products and services. A major industry sector in Indiana's defense contracts is transportation equipment manufacturing comprising 48.5 percent of total contract values for Indiana in 2010. The second largest sector is computer and electronic product manufacturing (19.9 percent), followed by professional, scientific and technical services (9.7 percent). The top ten industry sectors are listed in the Table 2.

TABLE 2 - **TOP 10 PRODUCTS & SERVICES BY INDUSTRY SECTOR, 2010**

	Industry Sector (NAICS Code)	*Number of Contracts**	*Contract Value ($ million)*	*Percentage of Total Contract Value*
1	Transportation Equipment Manufacturing (336)	3,084	1,948	48.5
2	Computer and Electronic Product Manufacturing (334)	711	800	19.9
3	Professional, Scientific, and Technical Services (541)	409	389	9.7
4	Merchant Wholesalers, Non-durable Goods (424)	224	208	5.2
5	Petroleum and Coal Products Manufacturing (324)	9	132	3.3
6	Building Construction (236)	124	61	1.5
7	Food Manufacturing (311)	101	59	1.5
8	Machinery Manufacturing (333)	405	45	1.1
9	Heavy and Civil Engineering Construction (237)	108	43	1.1
10	Fabricated Metal Product Manufacturing (332)	752	37	0.9
	All others, including N/A	3,491	294	7.3
	Total Contract Value	**9,418**	**4,020**	**100**

**A single contract may have been classified under one or more industry sectors. In our calculations and table, this was accounted for and adjusted.*

SOURCE: USA Spending data feed/archives, *www.usaspending.gov*

TABLE 3 - DETAILED ANALYSIS OF INDUSTRY SECTORS, 2009-2010

	Industry Sector (NAICS Code)	*Number of Contracts*	*Contract Value ($ million)*	*Percentage of Total Contract Value*	*Total Establishments, 2009*	*Number of Employees, 2009*	*Q1 Payroll, 2009 ($ thousand)*	*Annual Payroll, 2009 ($ thousand)*
1	Light Truck and Utility Vehicle Manufacturing (336112)	16	808	20.1	9	7,626	113,339	467,168
2	Aircraft Engine and Engine Parts Manufacturing (336412)	476	652	16.2	12	6,139	141,279	480,709
3	Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing (334220)	159	528	13.1	8	2,904	36,438	123,354
4	Search Detection Navigation Guidance Aeronautical and Nautical System and Instrument Manufacture (334511)	82	172	4.3	8	1,000-2,499	N/A	N/A
5	Engineering Services (541330)	133	164	4.1	1,007	14,675	245,953	1,006,804
6	Other Aircraft Parts and Auxiliary Equipment Manufacturing (336413)	583	138	3.4	9	500-999	N/A	N/A
7	Petroleum Refineries (324110)	7	132	3.3	7	1,000-2,499	N/A	N/A
8	Petroleum and Petroleum Products Merchant Wholesalers (except Bulk Stations and Terminals) (424720)	61	120	3.0	55	558	6,494	27,261
9	Military Armored Vehicle Tank and Tank Component Manufacturing (336992)	1,552	113	2.8	2	1,000-2,499	N/A	N/A
10	Research and Development in the Physical Engineering and Life Sciences (541710)	37	109	2.7	168	7,268	177,620	572,807
	All others (including N/A)	6,312	1,080	26.9				
	Total Contracts Value	**9,418**	**4,018**	**100**				

SOURCE: USA Spending data feed/archives, *www.usaspending.gov*. For total establishments, paid employee and payroll data: County Business Patterns, 2009.

TABLE 4 - IMPLAN RESULTS FOR LIGHT TRUCK MANUFACTURING (344) IN INDIANA, 2009-2010

	PLACE PERFORMANCE INDIANA			2009 *Total Contract Value: $2.4365 billion*			2010 *Total Contract Value: $791.6 million*			2009-2010 IMPORTS	
Commodity	*Gross Coefficients*	*Gross Inputs ($ million)*	*RPC**	*Gross Coefficients*	*Regional Inputs ($ million)*	*Imports ($ million)*	*Gross Coefficients*	*Regional Inputs $ million)*	*Imports ($ million)*	*% of imports*	*Imports Share (%)*
Motor vehicle parts manufacturing	0.57	9452.18	0.15	1387.04	208.53	1178.51	450.64	67.75	382.89	85.0	76.24
Wholesale trade	0.05	751.18	0.68	110.23	74.84	35.39	35.81	24.31	11.50	32.1	2.29
Automotive repair and maintenance- except car wash	0.03	433.55	0.90	63.62	57.26	6.36	20.67	18.60	2.07	10.0	0.41
Other engine equipment manufacturing	0.02	308.81	0.60	45.32	27.29	18.03	14.72	8.87	5.86	39.8	1.17
Audio and video equipment manufacturing	0.02	266.79	0.47	39.15	18.29	20.86	12.72	5.94	6.78	53.3	1.35
Truck transportation	0.01	204.56	0.97	30.02	29.09	0.92	9.75	9.45	0.30	3.1	0.06
All other miscellaneous professional and technical	0.01	188.82	0.39	27.71	10.77	16.94	9.00	3.50	5.50	61.1	1.10
Tire manufacturing	0.01	164.16	0.00	24.09	0.01	24.08	7.83	0.00	7.82	100.0	1.56
Semiconductors and related device manufacturing	0.01	161.56	0.01	23.71	0.30	23.40	7.70	0.10	7.60	98.7	1.51
Motor vehicle body manufacturing	0.01	141.70	0.46	20.79	9.65	11.14	6.76	3.14	3.62	53.6	0.72
Management of companies and enterprises	0.01	140.77	0.51	20.66	10.64	10.02	6.71	3.46	3.26	48.5	0.65
Lessors of nonfinancial intangible assets	0.01	136.53	0.56	20.04	11.32	8.72	6.51	3.68	2.83	43.5	0.56
Glass and glass products- except glass containers	0.01	127.06	0.72	18.64	13.49	5.16	6.06	4.38	1.68	27.7	0.33
Specialized design services	0.01	122.62	0.56	17.99	10.16	7.83	5.85	3.30	2.54	43.5	0.51
Other Commodities	0.12	2055.05	0.41	301.58	123.16	178.43	97.98	40.01	57.97	59.2	11.54
Total Commodity Demand	**0.88**	**14655.3**		**2150.6**	**604.8**	**1545.8**	**698.7**	**196.5**	**502.2**	**71.9**	**100**

**Regional purchasing coefficient (RPC) is one if all raw materials are locally available. RPC is 0 if 100 percent of the raw materials are imported.*

SOURCE: IMPLAN

Manufacturing Sector

A substantial share of defense contracts in Indiana is the light truck and utility vehicle manufacturing sector (20.1 percent in 2010 and 36.3 percent in 2009). The aircraft engine and parts manufacturing sector received the second highest number of contracts in terms of value (16.2 percent in 2010 and 9.6 percent in 2009), followed by radio and television broadcasting and wireless communications equipment manufacturing sector (13.1 percent in 2010 and 9.6 percent in 2009). The bottom sectors each represent less than five percent, as shown in Table 3. Total establishments, employment and payroll information for each sector for 2009 are also shown in Table 3.

Detailed Analysis of Light Truck Manufacturing

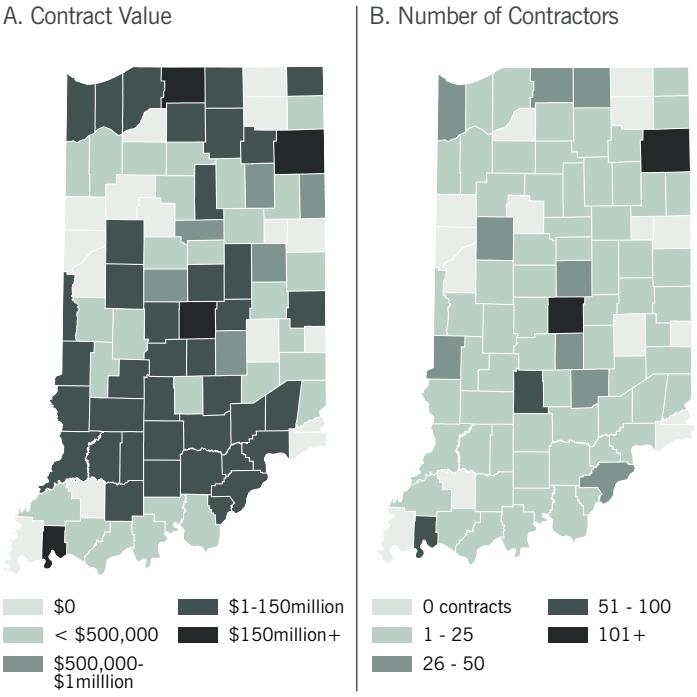
Due to the fact light truck manufacturing constitutes only 18 percent of total contract values in 2010 (36 percent in 2009), we analyzed further its regional purchasing coefficient of its backward linkages using the IMPLAN economic impact modeling system. Table 4 shows the results of this model. It can be seen that the light truck manufacturing sector imports finished products from the motor vehicle parts manufacturing sector (85 percent imports), audio and video equipment (53 percent imports), tire manufacturing (100 percent imports), semiconductor manufacturing (98 percent imports) and motor vehicle body manufacturing sector (54 percent imports). Overall, 72 percent of all the products are imported by the light truck manufacturing sector for use in Indiana. The total contract value of $2.5 billion was produced in Indiana in 2010 ($792 million in 2009). Approximately $500 million worth of products were imported in 2010 to the light truck manufacturing sector, a decrease from $1.55 billion in 2009. These numbers indicate the opportunity cost of new businesses focusing on the sectors with lower regional purchasing coefficients (RPC) with a potential to increase the economic development activity of this sector in Indiana.

Contracts and Contractors by Location

In 2010, a majority of DoD contracts were granted to contractors in counties that include Indiana's largest cities. Contractors in Allen, Marion, Vanderburgh and St. Joseph counties had the largest amounts of contracts with DoD. More firms and companies are concentrated in the biggest and economically strong Indiana cities such as Evansville, Indianapolis, Fort Wayne, and South Bend.

As shown in Figure 6, the distribution of contractors is relatively even around the state. With the exception of a few counties (Allen, Marion, Monroe and Vanderburgh) most of the counties have less than 50 contractors receiving contracts from the DoD. The largest contract—a South Bend contractor specializing in design, engineering, production, and technical and parts supporting military and special purpose vehicles—received contracts valued at more than $800 million in 2010. As a result, St. Joseph became the top county in terms of contract values in Indiana for 2010.

FIGURE 5 - **CONTRACTS & CONTRACTORS BY INDIANA COUNTIES**



SOURCE: USA Spending data feed/archives, *www.usaspending.gov*

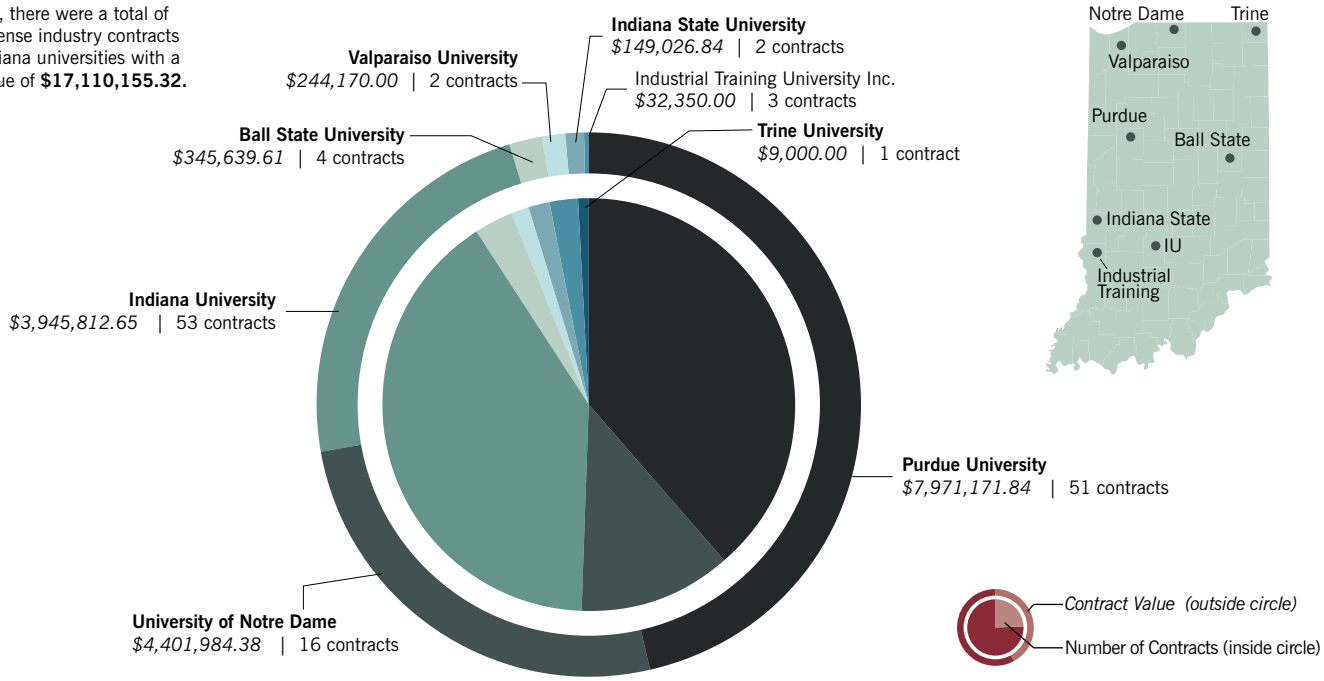
Contracts by Universities

Higher education institutions and many Indiana universities are connected to the Department of Defense by providing educational and research and development services. Figure 7 shows ranking by contract values for selected Indiana universities in 2010. The leading DoD contract research university recipient in the state was Purdue University ($8 million, 51 contracts in total). It conducted over $3 million in research and development and $2 million in education and training services. The University of Notre Dame had a total of $4.4 million over 16 contracts. Notre Dame provided $2.9 million in research and development services and $1.4 million in education and training services. This was followed by Indiana University ($3.9 million , 53 contracts in total), primairly providing research and development services ($3 million) and education services ($900,000). Other Indiana universities, as shown in Figure 6, provided a variety of other services, including education and training, administrative services, and equipment maintenance and repair services.

FIGURE 6 - DEFENSE CONTRACTS WITH INDIANA UNIVERSITIES, 2010

A. SHARE OF TOTAL CONTRACTS BY INSTITUTION

In 2010, there were a total of **130** defense industry contracts with Indiana universities with a total value of **$17,110,155.32.**

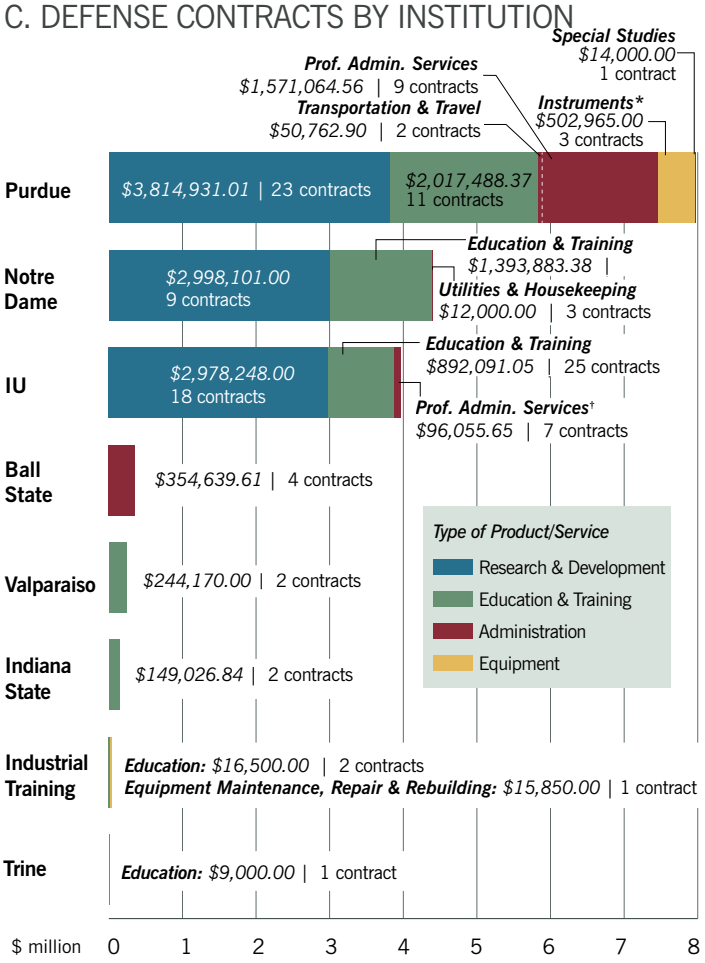


B. CONTRACTS BY PRODUCT/SERVICE TYPE

Product or Service	*Number of Contracts*	*Contract Value*
Research & Development	50	$9,791,280.01
Education & Training Services	47	$4,722,119.64
Administrative Services	25	$2,084,522.72
Professional Administrative & Management Support Services	*20*	*$2,021,759.82*
Transportation, Travel, & Relocation Services	*2*	*$50,762.90*
Utilities & Housekeeping Services	*3*	*$12,000.00*
Equipment Services	9	$498,232.95
Equipment Maintenance, Repair, & Rebuilding	*2*	*$17,839.95*
Quality Control, Testing, & Inspection Services	*2*	*-$22,572.00*
Equipment Modification	*2*	*$0.00*
Instruments & Laboratory Equipment	*3*	*$502,965.00*
Total	**130**	**$17,110,155.32**

**Purdue University also had two "equipment modification" contracts not displayed; the value of these contracts was $0.00.*
†Professional administrative services at IU also include direct contracts. IU also had several equipment services: equipment maintenance, repair, and rebuilding ($1,989.95; one contract) and quality control, testing, and inspection services (-$22,572.00; two contracts).

C. DEFENSE CONTRACTS BY INSTITUTION



SBIR & STTR Defense Contracts

Awards in Indiana

A number of small firms provided professional scientific and engineering services to fulfill DoD contracts, some of which received contracts of relatively large value. Some of these companies receive relatively large award amounts. These contracts primarily provided specialized products and services such as software development to DoD projects. Most of small business contracts were divided into one of two categories: Small Business Innovation Research (SBIR) or Small Business Technology Transfer (STTR). These contracts were also divided into two phases within each year. The SBIR and STTR contracts and total values for three consecutive years (2008, 2009 and 2010) are shown in Figure 8.

Phase 1 SBIR contracts increased in value by 36 percent in 2009; this phase also saw an increase in the total number of contracts. Phase 1 contract values in 2010, however, saw a slight decrease of eight percent. Phase 2 SBIR contract values decreased by 45 percent in 2009, followed by a 40 percent increase in 2010.

Overall, STTR contract values were lower than SBIR contracts. Phase 1 STTR contract values increased by 21 percent in 2009, then decreased by 50 percent in 2010. Phase 2 STTR contract values saw a 44 percent decrease in 2009, followed by a 22 percent increase in 2010.

Top SBIR/STTR Contracts for 2010

The number of small business contractors increased from 19 firms in 2009 to 23 firms in 2010. The top ten contractors in terms of contract values are shown in Table 5. This firms provided a variety services, including aerospace manufacturing, business support, engineering, software development, technical services and biotechnology research and development. Contract values also varied across firms. Some firms received a single, large contract, while others received several contracts of smaller values.

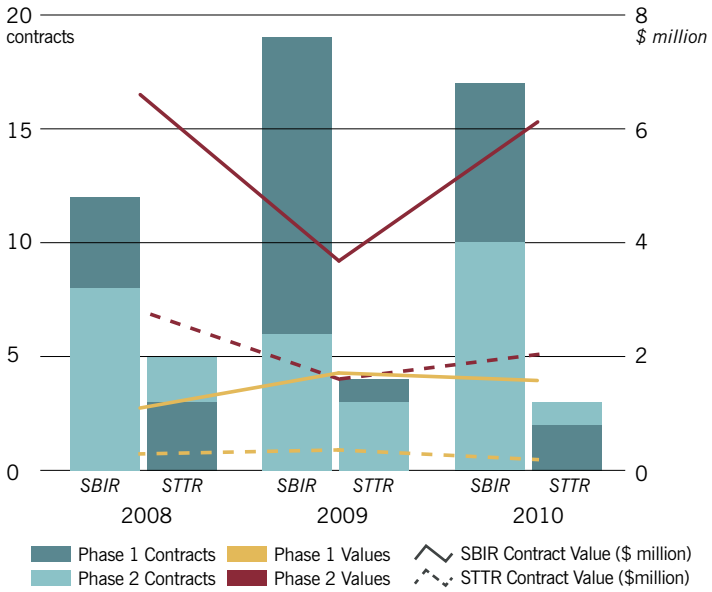
SBIR and STTR Contracts in the Technology Sector

Figure 9 shows the different areas of specialized services fulfilled by small businesses in Indiana. The largest number of SBIR/STTR contracts and contracts with the highest values were found in the sensors, electronics and electronic warfare technology sector, followed by the human systems sector.

Place of Performance Contracts

Several DoD contracts managed in other states were fulfilled in Indiana; similarly, a few contracts managed in Indiana were fulfilled in locations outside the state. Figure 10 shows the trend of DoD contracts fulfilled in Indiana from 2001 to 2010. It also shows the contract values for the top four sectors. The light truck and utility vehicle manufacturing sector consistently received

FIGURE 7 - SMALL BUSINESS INNOVATION RESEARCH (SBIR) & SMALL BUSINESS TECHNOLOGY TRANSFER (STTR) CONTRACTS



SOURCE: SBA (*http://web.sba.gov/tech-net)*

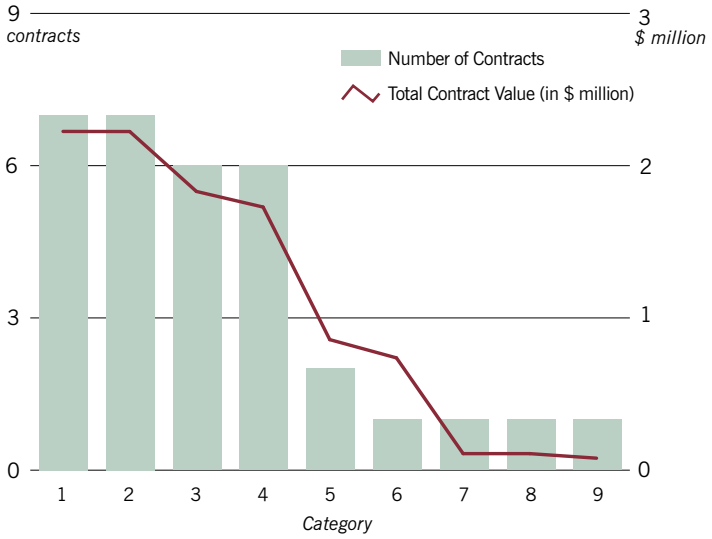
TABLE 5 - TOP 10 FIRMS AWARDED SBIR/STTR CONTRACTS, 2010

	Firm Name	*Firm Profile*	*Number of Contracts*	*Contract Value ($ million)*
1	Bashpole, Inc.*	Professional, scientific and technical services	1	990,000
2	PC Krause and Associates, Inc.	Engineering and Software	4	989,987
3	Techshot, Inc.	Product and technology development	5	979,795
4	Odyssian Technology, LLC	Professional, scientific and technical services	2	849,819
5	Conflict Kinetics	Business support services	1	749,910
6	Wolf Technical Services, Inc.	Forensic engineering, accident reconstruction, R&D, graphics and animation for litigation, expert witness services	1	729,951
7	Nesch, LLC	Computer systems design services	1	729,880
8	Imaginestics, LLC	Intelligent supply chain	1	669,337
9	Mudawar Thermal Systems, Inc.	Engineering	1	653,5611
10	Foresite, Inc.	R&D in biotechnology	1	498,966

**North Webster office, Indiana*

SOURCE: SBA (*http://web.sba.gov/tech-net)*; Firm profiles can be found at the company's respective web site, including: *www.bashpoleinc.com; www.manta.com; www.openfos.com; www.imaginestics.com; www.residues.com.*

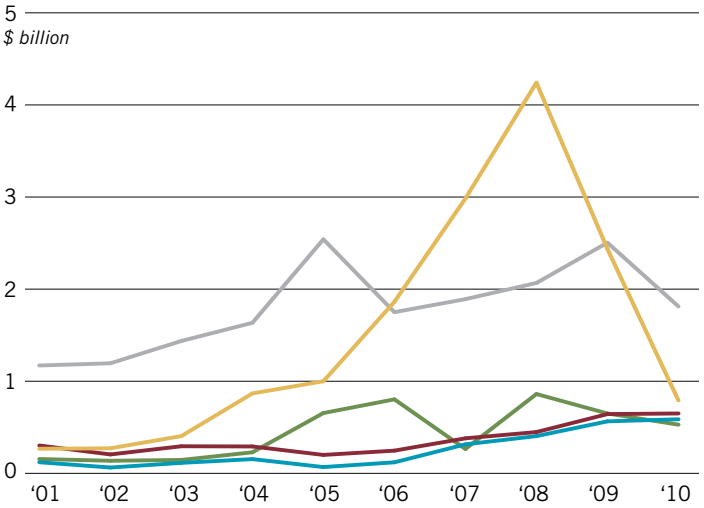
FIGURE 9 - **SBIR/STTR CONTRACTS AWARDED BY TECHNOLOGY SECTOR IN INDIANA, 2010**



	Category		Category
1	Sensors, electronics & electronic warfare	6	Weapons
2	Human systems	7	Battlespace environments
3	Materials/processes	8	Space platforms
4	Information systems technology	9	Ground and sea vehicles
5	Air platforms		

SOURCE: SBA (*http://web.sba.gov/tech-net)*

FIGURE 10 - **TOP PLACE OF PERFORMANCE INDUSTRIES IN INDIANA, 2001-2010**



	Sector	NAICS Code
1	Light truck and utility vehicle manufacturing	336112
2	Aircraft, engine, and engine parts manufacturing	336412
3	Engineering services	541330
4	Radio and television broadcasting and wireless communications equipment manufacturing	334220
	Other sectors	

SOURCE: USA Spending data feed/archives, *www.usaspending.gov*

contracts of the highest value. This was followed by the aircraft engine and parts manufacturing sector, engineering services sector, and radio/television broadcasting/wireless communications equipment manufacturing sector. Total contract values peaked in 2008, followed by a decline due primarily to decrease in light truck and utility vehicle manufacturing.

Economic Impact

In order to assess DoD contracts on Indiana's economy, we used the well-known regional impact model by REMI, Inc., operated by the Center for Business and Economic Research at Ball State University. The model permitted us to simulate a variety of economic changes in Indiana's economy. Our simulation consists of an evaluation of 2009 and 2010 data for the top four sectors: light truck and utility vehicle manufacturing; aircraft, engine, and parts manufacturing; engineering services; and radio and television broadcasting and wireless communications equipment manufacturing. We focused on key economic variables: total and private sector employment, state Gross Domestic Product, incomes and population changes. Table 6 shows the results from simulation.

Defense Industry Trends in the US

Federal spending on military equipment, training and supplies varies dramatically with a variety of factors. Not surprisingly, the length and depth of armed conflicts play a role in the cost of training and supplies. The use of Reserve and National Guard forces also plays a role in the cost of training as these forces are prepared for deployment and missions akin to those of active duty forces. The type of conflict affects the cost of equipping the force. A deployment for which the armed forces are appropriately equipped (e.g. the Persian Gulf War) will require smaller equipment purchases than those for which the armed forces identify differing equipment requirements. Also, U.S. military forces frequently find that equipping allied forces with common communications equipment, vehicles and ammunition reduces operational difficulties. This typically increases domestic defense spending.

Long term changes to the force also influence spending on defense related activities. As military forces modernize the costs of acquisition and R&D result in larger defense spending on contracts for the provision of goods and services. Figures 11 and 12 provide a recent overview of national defense spending trends.

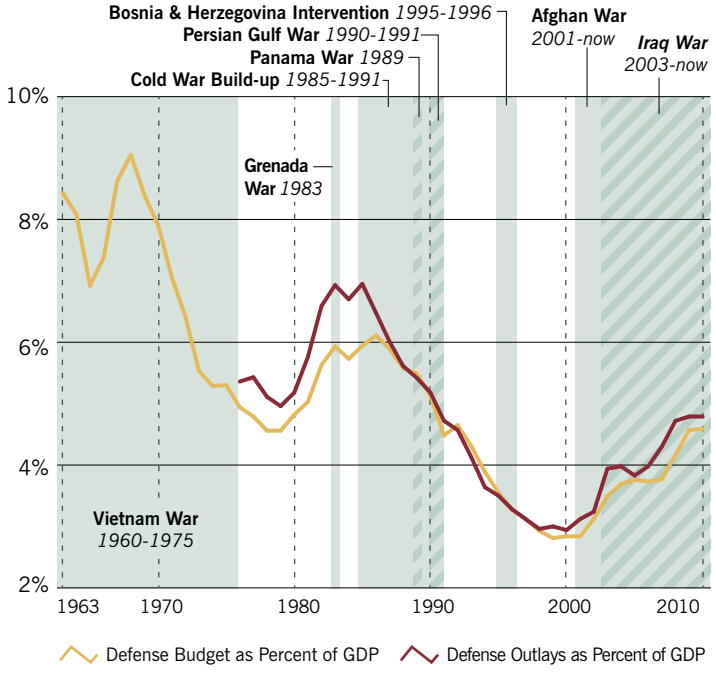
TABLE 6 - **ECONOMIC CHANGES IN SELECTED VARIABLES IN INDIANA, 2009-2010**

Category *Change in...*	*Units*	*LIGHT TRUCK MFG.*		*Aircraft Mfg.*		*Engineering Services*		*Radio, etc. Mfg.**	
		2009	2010	2009	2010	2009	2010	2009	2010
Total Employment	Thousands (Jobs)	6.74	2.334	5.016	4.936	10.947	10.745	4.178	3.306
Private Non-Farm Employment	Thousands (Jobs)	5.104	1.789	4.483	4.401	9.99	9.811	3.62	2.857
Gross Domestic Product	Billions of Fixed (2005) Dollars	0.863	0.297	0.382	0.395	0.582	0.585	0.318	0.264
Output	Billions of Fixed (2005) Dollars	3.015	1.012	0.871	0.896	0.99	0.994	0.9	0.743
Value Added	Billions of Fixed (2005) Dollars	0.863	0.297	0.382	0.395	0.582	0.585	0.318	0.264
Personal Income	Billions of Current Dollars	0.307	0.128	0.267	0.282	0.481	0.517	0.211	0.183
Disposable Personal Income	Billions of Current Dollars	0.273	0.115	0.238	0.253	0.427	0.461	0.188	0.163
Real Disposable Personal Income	Billions of Fixed (2005) Dollars	0.267	0.103	0.234	0.238	0.417	0.43	0.185	0.153
Population	Thousands	1.532	1.785	1.178	2.117	1.913	3.413	0.945	1.517

**Radio and television broadcasting and wireless communications equipment manufacturing*

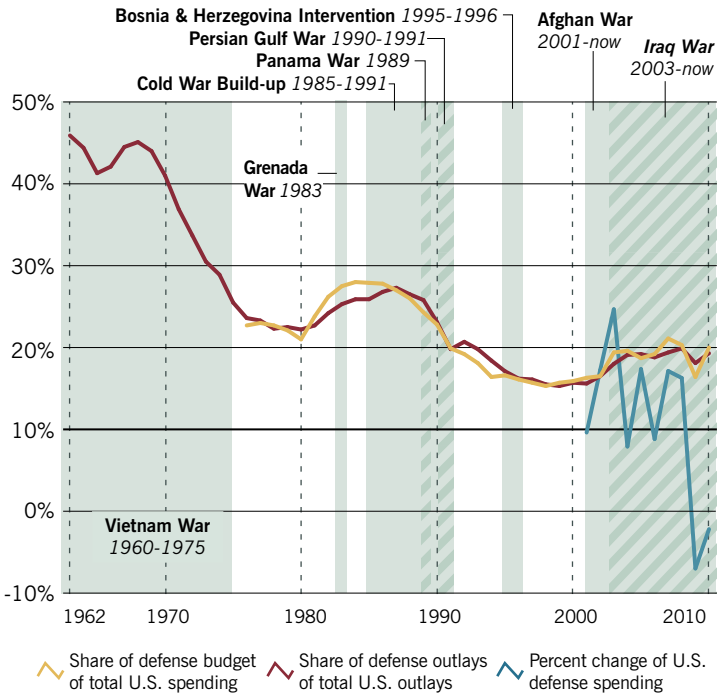
SOURCE: USA Spending data feed/archives, *www.usaspending.gov*

FIGURE 11 - **DEFENSE BUDGET & OUTLAYS AS A PERCENTAGE OF U.S. GDP, 1963-2010**



SOURCE: White House budget archives: http:*//www.whitehouse.gov/omb/budget/historical;* BEA National GDP Data: *http://bea.gov/newsreleases/national/gdp/gdpnewrelease.htm;* U.S. War Timeline at About.com: *http://american-history.about.com/library/timelines/bltimelineuswars.htm.*

FIGURE 12 - **DEFENSE BUDGET & OUTLAYS AS A PERCENTAGE OF TOTAL U.S. BUDGET & OUTLAYS, 1962-2010**



SOURCE: White House budget archives: http:*//www.whitehouse.gov/omb/budget/historical;* BEA National GDP Data: *http://bea.gov/newsreleases/national/gdp/gdpnewrelease.htm;* U.S. War Timeline at About.com: *http://american-history.about.com/library/timelines/bltimelineuswars.htm.*

Summary and Conclusions

Defense spending in Indiana comprises a large share of the State's Gross Domestic Product. While the total value of contracts peaked in 2008, in the most recent year available, 2010, over 9,400 contracts, valued at over $4 billion were spent in Indiana on defense related contracts.

Using a regional model of Indiana produced by REMI, Inc, we assessed the economic impact of just the four largest contract sectors: light trucks, aircraft and aerospace, engineering and communications manufacturing. Together defense spending in Indiana in these sectors accounted for more than 21,000 jobs, adding almost $1.6 billion to the states' economy and increasing personal income by over $1.1 billion.

The end of combat operations in Iraq, and the eventual decline of U.S. forces in Afghanistan will noticeably slow defense spending on some types of equipment, supplies and training. Nevertheless, overall spending by the DoD in Indiana will continue to be an important part of Indiana's high technology manufacturing and R&D focused economy.

Appendix

TABLE A.1 - **TREND OF CONTRACTS ALLOCATED IN INDIANA, 2000-2010**

Fiscal Year	*Number of Contracts*	*Number of Contractors*	*Total Contract Value ($billion)*
2000	1,796	366	1.37
2001	2,114	422	1.78
2002	3,838	567	1.82
2003	6,569	775	2.30
2004	7,331	886	3.09
2005	13,413	1,095	4.46
2006	8,093	1,096	4.85
2007	9,420	1,141	5.75
2008	10,532	1,180	7.72
2009	9,143	1,221	6.74
2010	9,418	1,317	4.02

SOURCE: USA Spending data feed/archives, *www.usaspending.gov*

TABLE A.2 - **PRODUCTS & SERVICES BY INDIANA VENDORS, 2000-2010**

Fiscal Year	PRODUCTS		SERVICES		*Total Contract Value ($billion)*	*Number of Contractors*
	Amount ($billion)	Percentage	Amount ($billion)	Percentage		
2000	.85	62	.52	38	1.37	366
2001	1.10	62	.68	38	1.78	422
2002	1.35	74	.47	26	1.82	567
2003	1.72	75	.58	25	2.30	775
2004	2.43	79	.66	21	3.09	886
2005	3.83	86	.63	14	4.46	1,095
2006	4.12	85	.73	15	4.85	1,096
2007	4.98	87	.77	13	5.75	1,141
2008	7.01	91	.71	9	7.72	1,180
2009	5.28	78	1.46	22	6.74	1,221
2010	3.19	79	.83	21	4.02	1,317

SOURCE: USA Spending data feed/archives, *www.usaspending.gov*

TABLE A.3 - **TOP 10 PRODUCTS PRODUCED IN INDIANA, 2010**

	Product	*Number of Contracts*	*Contract Value ($ million)*	*Percentage of Total Contract Value*
1	Trucks and Truck Tractors Wheeled	1,492	570	17.9
2	Radio and Television Communication Equipment Except Airborne	74	399	12.5
3	Combat Assault and Tactical Vehicles Wheeled	2	329	10.3
4	Gas Turbines and Jet Engines Aircraft; Prime Moving and Components	170	287	9.0
5	Liquid Propellants and Fuels Petroleum Base	35	134	4.2
6	Miscellaneous Aircraft Accessories and Components	120	128	4.0
7	Aircraft Rotary Wing	2	123	3.9
8	Fuel Oils	44	119	3.7
9	Diesel Engines and Components	59	116	3.6
10	Radio Navigation Equipment Airborne	14	115	3.6
	All others	6,153	872	27.3
	Total	**8,165**	**3,192**	**100.0**

SOURCE: USA Spending data feed/archives, *www.usaspending.gov*

TABLE A.4 - **TOP 10 SERVICES PROVIDED IN INDIANA, 2010**

	Product	*Number of Contracts*	*Contract Value ($ million)*	*Percentage of Total Contract Value*
1	Maintenance Repair and Rebuilding of Equipment - Engines Turbines and Components	18	110	13.4
2	Engineering and Technical Services	72	78	9.4
3	Logistics Support Services	16	66	8.0
4	Defense Aircraft - Applied Research and Exploratory Development (R&D)	22	65	7.8
5	Systems Engineering Services	12	61	7.4
6	R&D-Aircraft-Comercliz	10	49	6.0
7	Defense Electronics and Communication Equipment - Operational Systems Development (R&D)	4	44	5.4
8	Modification of Equipment - Guided Missiles	3	40	4.8
9	Maintenance Repair or Alteration of Real Property - Miscellaneous Buildings	91	22	2.7
10	Construction of Structures and Facilities - Other Administrative Facilities and Service Buildings	32	21	2.5
	All others	1,273	270	32.7
	Total	**1,553**	**826**	**100.0**

SOURCE: USA Spending data feed/archives, *www.usaspending.gov*

TABLE A.5 - **SMALL BUSINESS INNOVATION RESEARCH (SBIR) & SMALL BUSINESS TECHNOLOGY TRANSFER (STTR) CONTRACTS**

SMALL BUSINESS INNOVATION RESEARCH (SBIR)

	2008		2009		2010	
	Contracts	*Value ($)*	*Contracts*	*Value ($)*	*Contracts*	*Value ($)*
Phase 1	12	1,078,810	19	1,697,266	17	1,564,624
Phase 2	8	6,598,474	6	3,654,188	10	6,114,917
Total	**20**	**7,677,284**	**25**	**5,351,454**	**27**	**7,679,541**

SMALL BUSINESS TECHNOLOGY TRANSFER (STTR)

	2008		2009		2010	
	Contracts	*Value ($)*	*Contracts*	*Value ($)*	*Contracts*	*Value ($)*
Phase 1	3	268,889	4	338,907	2	338,907
Phase 2	5	2,774,354	3	1,563,632	3	1,563,632
Total	**8**	**3,043,243**	**7**	**1,902,539**	**5**	**1,902,539**

SOURCE: SBA (*http://web.sba.gov/tech-net)*

TABLE A.6 - **SBIR/STTR CONTRACTS AWARDED BY TECHNOLOGY SECTOR IN INDIANA, 2010**

	Product	*Number of Contracts*	*Contract Value ($)*
1	Sensors, Electronics and Electronic Warfare	7	2,219,732
2	Human Systems	7	2,219,154
3	Materials/Processes	6	1,825,047
4	Information Systems Technology	6	1,733,242
5	Air Platforms	2	849,994
6	Weapons	1	729,880
7	Battlespace Environments	1	99,999
8	Space Platforms	1	99,953
9	Ground and Sea Vehicles	1	69,994

SOURCE: SBA (*http://web.sba.gov/tech-net)*

TABLE A.7 - **TOP PLACE OF PERFORMANCE INDUSTRIES IN INDIANA, 2001-2010**

CONTRACT VALUE ($ MILLION)

	Sector (NAICS code)	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*
1	Light Truck and Utility Vehicle Manufacturing (336112)	267.1	271.8	404.5	867.4	999.7	1,862.7	2,983.7	4,241.3	2,436.5	791.6
2	Aircraft Engine and Engine Parts Manufacturing (336412)	302.2	205.2	294.1	291.8	199.8	246.4	380.1	448.0	643.3	649.9
3	Engineering Services (541330)	120.4	63.1	113.6	154.5	68.0	119.6	314.7	404.2	564.4	587.0
4	Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing (334220)	155.3	136.3	145.6	228.3	654.4	803.3	264.6	861.1	649.8	528.2
	Others	1,171.0	1,194.6	1,437.1	1,634.4	2,540.4	1,749.9	1,891.2	2,066.9	2,504.3	1,812.1
	Total	**2,016.0**	**1,871.0**	**2,394.9**	**3,176.4**	**4,462.2**	**4,781.9**	**5,834.3**	**8,021.4**	**6,798.3**	**4,368.9**

SOURCE: USA Spending data feed/archives, *www.usaspending.gov*

TABLE A.8 - **DEFENSE BUDGET & OUTLAYS AS A PERCENTAGE OF U.S. GDP, 1963-2010**

Year	*Defense Budget**	*Defense Outlays**	*GDP**	*Defense Budget as % of GDP*	*Defense Outlays as % of GDP*
1963		51.147	607.008		8.43
1964		52.585	650.513		8.08
1965		48.78	704.697		6.92
1966		56.629	767.075		7.38
1967		70.069	811.782		8.63
1968		80.355	887.569		9.05
1969		80.771	962.902		8.39
1970		80.123	1012.299		7.91
1971		77.497	1097.173		7.06
1972		77.645	1210.292		6.42
1973		75.033	1356.5		5.53
1974		77.864	1472.024		5.29
1975		84.852	1602.228		5.30
1976	95.503	87.917	1780.497	5.36	4.94
1977	107.906	95.147	1986.408	5.43	4.79
1978	114.531	102.259	2243.23	5.11	4.56
1979	123.595	113.605	2489.416	4.96	4.56
1980	140.651	130.912	2713.933	5.18	4.82
1981	176.1	153.861	3057.318	5.76	5.03
1982	211.486	180.693	3211.37	6.59	5.63
1983	238.834	204.356	3445.372	6.93	5.93
1984	258.108	220.863	3853.668	6.70	5.73
1985	286.789	245.109	4126.664	6.95	5.94
1986	281.398	265.44	4340.813	6.48	6.11
1987	279.417	273.919	4649.02	6.01	5.89
1988	283.71	281.889	5053.003	5.61	5.58
1989	290.785	294.829	5366.08	5.42	5.49
1990	292.936	289.694	5651.747	5.18	5.13
1991	275.676	261.86	5842.665	4.72	4.48
1992	281.827	286.574	6167.644	4.57	4.65
1993	267.334	278.51	6467.698	4.13	4.31
1994	251.294	268.577	6912.844	3.64	3.89
1995	255.658	259.487	7299.372	3.50	3.55
1996	254.525	253.196	7749.965	3.28	3.27
1997	257.943	258.262	8270.462	3.12	3.12
1998	258.25	255.793	8727.023	2.96	2.93
1999	278.402	261.196	9286.858	3.00	2.81
2000	290.307	281.028	9884.171	2.94	2.84
2001	318.651	290.185	10218.019	3.12	2.84
2002	344.878	331.845	10642.3	3.24	3.12
2003	439.339	388.686	11142.2	3.94	3.49
2004	471.796	437.034	11853.3	3.98	3.69
2005	483.846	474.354	12623	3.83	3.76
2006	532.926	499.344	13377.2	3.98	3.73
2007	602.984	528.578	14028.7	4.30	3.77
2008	674.694	594.662	14291.5	4.72	4.16
2009	667.557	636.775	13939	4.79	4.57
2010	695.646	666.715	14526.5	4.79	4.59

**In current billions of dollars.*

SOURCE: USA Spending data feed/archives, *www.usaspending.gov*

TABLE A.9 - **MAJOR U.S. DEFENSE ENGAGEMENTS, 1960-TODAY**

Military Engagement	*Years Involved*
Vietnam War	1960 - 1975
Grenada War	1983
Cold War	1985 - 1991
Panama War	1989
Persian Gulf War	1990-1991
Intervention in Bosnia and Herzegovina	1995 - 1996
Afghanistan War	2001 - today
Iraq War	2003 - today

TABLE A.10 - **DEFENSE BUDGET & OUTLAYS AS A PERCENTAGE OF TOTAL U.S. BUDGET & OUTLAYS, 1962-2010**

Year	*US Defense Spending* ($ billion)*	*Defense budget's share of total US budget*	*Defense outlays' share of total US outlays*
1962			46.90
1963			45.90
1964			44.40
1965			41.30
1966			42.10
1967			44.50
1968			45.10
1969			44.00
1970			41.00
1971			36.90
1972			33.70
1973			30.50
1974			28.90
1975			25.50
1976		22.70	23.60
1977		23.00	23.30
1978		22.70	22.30
1979		22.10	22.50
1980		21.00	22.20
1981		23.80	22.70
1982		26.20	24.20
1983		27.50	25.30
1984		28.00	25.90
1985		27.90	25.90
1986		27.80	26.80
1987		27.00	27.30
1988		26.00	26.50
1989		24.30	25.80
1990		22.80	23.10
1991		19.90	19.80
1992		19.20	20.70
1993		18.10	19.80
1994		16.40	18.40
1995		16.60	17.10
1996		16.10	16.20
1997		15.70	16.10
1998		15.30	15.50
1999		15.70	15.30
2000	127.7257685	15.90	15.70
2001	140.0110235	16.30	15.60
2002	164.1728833	16.50	16.50
2003	204.6694772	19.40	18.00
2004	220.8601151	19.60	19.10
2005	259.2231893	18.70	19.20
2006	282.0778042	19.20	18.80
2007	330.4020288	21.10	19.40
2008	384.1874857	20.30	19.90
2009	357.3410645	16.40	18.10
2010	349.5308509	20.00	19.30

**In includes contracts, grants, other, direct payments.*

SOURCE: USA Spending data feed/archives, *www.usaspending.gov*

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Hicks received research and teaching awards from Tennessee, Marshall, AFIT and Ball State, and his research has been highlighted in such outlets as the Wall Street Journal, New York Times and Washington Post. He has appeared nationally on CSPAN, MSNBC, NPR's "All Things Considered" and Fox Business News. His weekly column on economics and current events is distributed through newspapers including the Indianapolis Business Journal, the South Bend Tribune and The Star Press.

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About the Center

The Center for Business and Economic Research (CBER) is an award-winning economic policy and forecasting research center housed within Ball State University's Miller College of Business. CBER research encompasses health care, public finance, regional economics, transportation, and energy sector studies.

The center produces the CBER Data Center—a one-stop shop for economic data, policy analysis, and regional demographics—and the Indiana Business Bulletin—a weekly newsletter with commentary on current issues and regularly updated data on housing, wages, employment, and dozens of other economic indicators.

In addition to research and data delivery, the center serves as the business forecasting authority in the Muncie area—holding the annual Indiana Economic Outlook luncheon and quarterly meetings of the Ball State University Business Roundtable.