Employment effects of the rise and fall in defense spending

Proposed defense spending cutbacks lead to a reduced supply of jobs in both the government and private sectors of the economy

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Purchases of goods and services for defense activities (in 1987 dollars) fell to $180 billion in 1976, the trough of the defense spending drawdown following the Vietnam conflict.[1] After that, defense spending began to increase during the 1970's and accelerated during the 1980's, peaking at $292.1 billion in 1987, up from 5.3 percent of gross domestic product in 1976 to almost 6.5 percent by 1987.

Accompanying the spending surge was an increase in jobs generated by that spending. Over the 1977–87 period, the lion's share of the new jobs were in the private sector of the economy, as employment related to defense expenditures rose by nearly 2.1 million jobs in response to the increased spending on more advanced hardware and on the research and development which went into the creation of that new hardware. In addition, civilian employment in the Defense Department rose by 160,000 jobs, and the level of the Armed Forces increased by 93,000.

In the late 1980's, however, the changed world political situation, which signaled a decrease in the potential threat to peace from Soviet Bloc countries, combined with increasing concern over the burgeoning Federal budget deficit, led to plans to begin cutting back on defense spending and on military force levels. Budget plans were developed which would lead to annual reductions in defense spending in real terms through 1997, accompanied by cutbacks in military force levels over that same span.

Under the plans developed at that time, it was proposed that defense spending should decline, in real terms, to $206 billion, or $86 billion lower than the 1987 peak.[2] Military force levels should drop under the proposal by 500,000, and civilian defense-related Federal Government employment should also decline, by 200,000 jobs, between 1987 and 1997. Further cuts proposed in the 1993 State of the Union address would result in projected real defense spending of $192 billion in 1997, a further $14 billion cut below the proposed level of just 1 year earlier, and military force levels at 1.4 million, an additional 200,000 below the level proposed by the previous administration.[3] It was estimated that 1.8 million defense-related jobs in the private sector would be lost as a result of the proposed cuts in spending between 1987 and 1997.[4]

The purpose of this article is to examine in more detail the decline in employment requirements in three areas (Armed Forces, Department of Defense civilian jobs, and defense-related private sector jobs), determine how much in the way of job cuts has already been seen in the economy and how much still lies ahead of us, and to look carefully at industries and occupations that would most likely be affected by the proposed cutbacks.

Where the losses are

As noted earlier, purchases of goods and services for national defense rose sharply between 1977 and 1987,[5] jumping from 5.1 percent of gross domestic product (GDP) in 1977 to almost 6.5 percent a decade later. (See table 1.) Direct employment

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by the Defense Department—civilian staff and uniformed Armed Forces—increased during this decade at a much slower rate than overall defense spending. The implication of this is that the major growth in spending was for the development of new weapons and defensive systems, rather than for increases in the size of the Armed Forces. In fact, until the current proposals to reduce the size of the Armed Forces, the level of uniformed personnel has remained remarkably fixed since the end of World War II. There were runups during the Korean War and during the Vietnam conflict, but levels of the Armed Forces returned to the more or less fixed number of individuals after each of these military actions was completed.

As noted, the high point of real defense spending was in 1987, when real purchases of defense goods and services reached $292 billion, 6.4 percent of GDP. By 1997, the proposed budget estimates imply a spending level of $192 billion, a cut of $100 billion over the decade. If this level of defense spending is attained, it is likely to account for about 3.5 percent of GDP in that year, well below the share claimed at the low point in the late 1970's.

For the purposes of analysis, it is useful to break the 1987–97 decade into two sub-periods, 1987 to 1992, and 1992 to 1997. Doing this allows us to examine how much of the proposed cutback has already taken place and how much is still to come. Of the total proposed cut of $100 billion over the decade, *less* than one-third, or $27 billion, has taken place in the first half of the 10-year period, leaving about $73 billion in spending cuts still to come.

By contrast, in terms of employment, about *half* of the proposed 200,000 job cut in Defense Department civilian employment has already taken place. But military force levels have fallen only 188,000 since 1987, leaving a further prospective cut of 537,000 if the called-for 1997 levels are to be reached. Private employment generated by defense spending already has fallen by about 600,000 jobs between 1987 and 1992, with a further projected drop of just over 1.2 million jobs in the coming 5 years, given the level of spending now anticipated. Considering all of the types of employment that would be affected in this analysis of defense spending cutbacks, the total potential job loss between 1987 and 1997 is expected to be 2.8 million. Of this total, about 897,000, or 32 percent, is estimated to have already taken place, leaving further cuts of 1.9 million jobs over the next 5 years, an average of about 380,000 per year.[6]

It is illuminating to note that the runup in defense spending between 1977 and 1987 was $111 billion in real terms, and was accompanied by an increase of 2.1 million defense-related jobs in the private sector. The 1987–97 defense cutbacks discussed here amount to a decline of $97 billion, accompanied by declines of 1.8 million jobs in the private sector of the economy. In short, the impact of the cutbacks on the private economy is less than the impact of the decade-earlier surge in defense spending.

Excluding impacts to the Federal Government itself, major areas of the economy that would likely absorb the greatest declines in defense-related jobs are manufacturing (594,000 fewer jobs over the next 5 years), services (286,000 fewer jobs), retail and wholesale trade (139,000 fewer), and transportation (62,000 fewer). (See table 2.)

Estimates of changes in defense-related employment in detailed industries are presented in table 3. Many of these industries are not surprising, as we reflect on those industries which are the most dependent on defense spending. For example, cutbacks in defense spending will surely affect guided missiles and space vehicles, ammunition and ordnance, shipbuilding, and aircraft.

Underlying uncertainties

The estimates for defense spending in this article are based on the initial 1992–97 Defense Department program of cutbacks, modified to reflect the cuts proposed by President Clinton in his State of the Union message.

The exact timing of the cuts and the distribution of the cuts among the various types of defense spending are based on assumptions which are subject to revision as later budget documents or changes to proposed spending patterns are made by the Congress.

Modest changes in the overall level of cutbacks would not appreciably alter these results. In fact, if no new information were forthcoming regarding the distribution of the cuts, then employment levels would change proportionately with the assumed changes in spending. That is, if the Congress were to pass a defense budget that was 10 percent lower than the one assumed for this article but did not specify where, in particular, the additional cuts were to be realized, employment levels associated with the new level of defense spending would also be 10 percent lower in all industries and occupations.

Shifts in the composition of defense cutbacks would likely not affect the level, but could impact the distribution among industries and occupations. If congressional action on the Defense Department budget were to spell out detailed areas for the spending cuts that were significantly different from those assumed in this article, then a careful reevaluation of the employment impacts would be necessary.

Table 1. **Defense purchases and employment in relation to the economy, selected years and projected to 1977**

Item	1977		1987		1992		1997	
	Billions of 1987 dollars	Percent of GDP	Billions of 1987 dollars	Percent of GDP	Billions of 1987 dollars	Percent of GDP	Billions of 1987 dollars	Percent of GDP
Gross domestic product (GDP)	$3,533.3	100.0	$4,539.9	100.0	$4,906.8	100.0	$5,408.0	100.0
Defense purchases	181.6	5.1	292.1	6.4	265.1	5.4	191.8	3.5
Compensation	96.3	2.7	108.7	2.4	102.6	2.1	84.4	1.6
Other defense	85.3	2.4	183.4	4.0	162.5	3.3	107.4	2.0
	Number (millions)	Percent of total employment	Number (millions)	Percent of total employment	Number (millions)	Percent of total employment	Number (millions)	Percent of total employment
Total employment [1]	94,090	100.0	114,606	100.0	119,633	100.0	128,441	100.0
Defense related	4,861	5.2	7,205	6.3	6,308	5.3	4,452	3.5
Civilian, Department of Defense	937	1.0	1,100	1.0	1,000	.8	900	.7
Armed Forces	2,073	2.2	2,166	1.9	1,978	1.7	1,441	1.1
Private	1,851	2.0	3,939	3.4	3,330	2.8	2,111	1.6

[1] Total employed, including resident Armed Forces plus Department of Defense estimates of Armed Forces stationed overseas.

Table 2. **Defense-related employment by major sector and occupational group, selected years and projected to 1997**

[In thousands]

Sector or occupational group	1977	1987	1992	1997	Level change			
					1977–87	1987–92	1992–97	1987–97
Sector								
Total defense-related employment	4,861.0	7,204.8	6,308.1	4,451.3	2,343.8	–896.7	–1,856.8	–2,753.5
Agriculture, forestry, fisheries	16.1	27.5	20.2	11.8	11.4	–7.3	–8.4	–15.7
Mining	26.1	31.2	27.4	18.2	5.1	–3.8	–9.2	–13.0
Construction	104.8	185.1	152.7	99.8	80.3	–32.4	–52.9	–85.3
Manufacturing	1,087.8	1,857.0	1,406.8	812.4	769.2	–450.2	–594.4	–1,044.6
Transportation	116.6	200.9	168.9	107.2	84.3	–32.0	–61.7	–93.7
Communications	24.3	38.0	28.5	15.5	13.7	–9.5	–13.0	–22.5
Public utilities	18.9	34.6	28.4	17.2	15.7	–6.2	–11.2	–17.4
Trade	203.8	496.8	428.2	289.6	293.0	–68.6	–138.6	–207.2
Finance, insurance, and real estate	41.5	87.1	72.9	47.2	45.6	–14.2	–25.7	–39.9
Services	178.5	920.6	947.0	660.8	742.1	26.4	–286.2	–259.8
Government (including military)	3,042.6	3,326.0	3,027.1	2,371.6	283.4	–298.9	–655.5	–954.4
Occupational group								
Total, all civilian occupations	.....	5,038.8	4,330.1	3,010.6	.....	–708.7	–1,319.5	–2,028.2
Executive, administrative, and managerial	.....	631.9	549.0	406.0	.....	–82.9	–143.0	–225.9
Professional specialty occupations	.....	724.6	629.8	495.5	.....	–94.8	–134.3	–229.1
Technicians and related support occupations	.....	288.6	253.5	194.5	.....	–35.1	–59.0	–94.1
Marketing and sales occupations	.....	275.5	248.5	174.4	.....	–27.0	–74.1	–101.1
Administrative support occupations	.....	927.7	828.2	564.4	.....	–99.5	–263.8	–363.3
Service occupations	.....	408.6	362.8	253.2	.....	–45.8	–109.6	–155.4
Agriculture, forestry, and fishing occupations	.....	71.9	63.2	42.5	.....	–8.7	–20.7	–29.4
Precision production, craft, and repair	.....	819.7	672.3	442.7	.....	–147.4	–229.6	–377.0
Operators, fabricators, and laborers	.....	890.3	722.8	437.4	.....	–167.5	–285.4	–452.9

Table 3. **Defense-related employment for selected industries, 1977, 1987, 1992, and projected to 1997**

[In thousands]

Industry	1977	1987	1992	1997
Civilian employment (excluding military)	2,788.0	5,038.8	4,330.0	3,011.0
Livestock and livestock products	5.4	6.4	4.7	2.6
Other agricultural products	6.2	8.0	4.4	2.2
Agricultural services	3.6	9.9	8.7	5.7
Metal mining	5.5	4.4	4.3	2.8
Coal mining	6.3	6.6	4.4	2.5
Crude petroleum, natural gas, and gas liquids	8.6	13.5	12.6	9.0
New nonfarm housing, n.e.c.	6.0	12.2	10.0	7.2
Nonfarm residential alterations and additions	5.6	13.3	7.7	4.9
New industrial buildings	3.6	10.5	7.5	5.3
New nonbuilding facilities, n.e.c.	15.3	16.3	13.2	7.8
Maintenance and repair construction	62.6	114.3	100.2	65.6
Sawmills and planing mills	4.5	6.3	4.8	2.8
Millwork and structural wood members, n.e.c.	2.1	5.2	4.1	2.7
Wood containers and miscellaneous wood products	3.8	5.7	4.3	2.5
Glass and glass products	3.9	5.9	4.5	2.6
Cement, concrete, gypsum, and plaster products	4.5	6.3	4.8	3.0
Stone, clay, and miscellaneous mineral products	6.7	9.7	8.2	5.0
Blast furnaces and basic steel products	28.8	24.9	19.0	11.0
Iron and steel foundries	9.8	10.5	7.8	4.2
Primary nonferrous metals	5.2	5.1	4.5	2.6
Miscellaneous primary and secondary metals	3.3	5.6	4.7	2.7
Nonferrous rolling and drawing	12.0	18.8	13.3	7.1
Nonferrous foundries	6.6	16.3	12.1	7.0
Cutlery, hand tools, and hardware	5.6	9.0	6.9	3.9
Fabricated structural metal products	25.6	33.1	27.7	16.0
Screw machine products, bolts, rivets, etc	6.9	13.4	10.5	6.3
Forgings	5.8	8.6	6.8	3.5
Stampings, except automotive	6.6	8.7	5.6	3.0
Metal services, n.e.c.	8.4	15.9	13.6	8.8
Small arms and small arms ammunition	7.6	8.3	6.1	3.2
Ammunition and ordnance, except small arms	18.6	37.8	32.7	17.5
Miscellaneous fabricated metal products	10.8	19.7	16.8	10.0
Engines and turbines	12.1	12.6	9.3	5.0
Metalworking machinery	14.1	26.9	19.9	11.6
General industrial machinery	10.8	21.0	14.2	8.2
Computer equipment	24.2	59.0	38.8	16.7
Refrigeration and service industry machinery	3.2	5.0	3.8	2.4
Industrial machinery, n.e.c.	17.8	44.2	37.0	21.5
Electric distribution equipment	4.1	7.9	6.1	3.7
Electrical industrial apparatus	15.7	21.8	16.4	9.1
Electric lighting and wiring equipment	6.7	10.2	7.5	4.5
Broadcasting and communications equipment	37.8	67.3	49.6	26.8
Semiconductors and related devices	24.6	80.5	63.6	39.4
Miscellaneous electronic components	38.7	83.2	62.4	36.8
Storage batteries and engine electrical parts	2.8	6.2	5.0	2.7
Electrical equipment and supplies, n.e.c.	12.5	15.1	11.1	6.3
Motor vehicles and car bodies	7.0	13.9	6.0	2.7
Motor vehicle parts and accessories	7.4	17.6	10.8	5.9
Aircraft	123.9	192.5	133.1	76.3
Aircraft and missile engines	64.4	108.7	74.7	43.4
Aircraft and missile parts and equipment	34.7	98.2	86.7	51.0
Guided missiles and space vehicles	44.2	116.6	87.4	50.7
Ship building and repairing	82.9	101.7	92.5	57.3
Boat building and repairing	1.5	4.5	5.0	3.1
Miscellaneous transportation equipment	10.6	15.8	8.3	4.4
Search and navigation equipment	71.0	119.2	76.5	44.0
Measuring and controlling devices; watches	40.7	49.0	37.2	20.5
Photographic equipment and supplies	3.6	8.7	6.3	3.4
Manufactured products, n.e.c.	4.5	6.3	5.2	3.3
Weaving, finishing, yarn and thread mills	9.6	13.0	9.0	4.7
Apparel	15.3	18.8	13.6	7.2
Miscellaneous fabricated textile products	3.1	5.6	4.3	2.3
Pulp, paper, and paperboard mills	5.0	7.6	5.9	3.4

Table 3. **Continued—Defense-related employment for selected industries, 1977, 1987, 1992, and projected to 1997**

[In thousands]

Industry	1977	1987	1992	1997
Paperboard containers and boxes	4.3	6.4	5.2	3.3
Converted paper products except containers	3.0	5.5	4.4	2.8
Newspapers	4.7	11.1	9.6	6.2
Accounting, auditing, and services, n.e.c.	13.8	42.7	44.1	33.9
Commercial printing and business forms	8.9	20.2	17.5	10.9
Industrial chemicals	15.3	16.7	13.9	8.0
Plastics materials and synthetics	6.0	7.3	6.0	3.4
Miscellaneous chemical products	5.5	6.1	4.9	2.9
Petroleum refining	5.9	6.5	5.1	3.3
Rubber products, plastic hose and footwear	9.0	14.9	11.7	6.8
Miscellaneous plastics products, n.e.c.	13.3	29.7	25.0	15.8
Railroad transportation	18.3	13.3	8.3	4.9
Local and interurban passenger transit	4.3	6.6	6.3	4.1
Trucking and warehousing	65.3	112.0	92.6	58.9
Water transportation	10.7	14.0	10.5	7.4
Air transportation	17.4	38.6	36.3	22.4
Passenger transportation arrangement	.0	7.5	6.9	4.3
Miscellaneous transportation services	.0	8.0	7.3	4.8
Communications, except broadcasting	21.9	30.9	22.6	12.0
Radio and television broadcasting, cable TV	2.4	7.0	5.9	3.5
Electric utilities including combined services	12.5	23.4	18.3	11.0
Gas utilities including combined services	4.5	6.7	5.0	2.8
Water and sanitation including combined services	1.9	4.5	5.1	3.4
Wholesale trade	115.2	223.2	174.8	105.5
Retail trade, excluding eating and drinking places	41.3	148.9	150.9	118.0
Eating and drinking places	47.4	124.7	102.5	66.1
Depository institutions	16.8	26.2	21.7	13.3
Nondepository; holding and investment offices	2.5	8.9	8.0	5.7
Security and commodity brokers	1.9	7.5	5.8	3.6
Insurance carriers	6.0	10.3	7.8	5.0
Insurance agents, brokers, and services	2.6	5.6	4.7	3.3
Real estate	11.7	28.7	25.0	16.2
Hotels and other lodging places	42.4	71.2	59.2	36.2
Laundry, cleaning, and shoe repair	3.4	7.5	5.8	3.7
Advertising	2.2	7.5	7.0	4.6
Services to buildings	21.4	92.4	93.5	62.9
Miscellaneous equipment rental and leasing	.0	11.0	11.7	8.1
Personnel supply services	9.3	157.6	173.7	115.6
Computer and data processing services	9.1	59.4	70.3	61.6
Detective, guard, and security services	.0	28.6	24.4	15.1
Photocopying, commercial art, and photofinishing	.0	6.9	6.8	4.6
Business services, n.e.c.	.0	28.0	27.6	20.1
Automotive rentals, without drivers	3.1	8.3	7.6	5.1
Automobile parking, repair, and services	5.0	10.5	10.4	7.2
Electrical repair shops	4.8	8.5	7.9	5.2
Miscellaneous repair shops and related services	14.4	32.5	29.0	19.2
Motion pictures	6.8	13.0	13.5	9.7
Legal services	6.6	21.4	19.5	13.3
Colleges and universities	9.8	17.8	16.4	10.9
Job training and related services	6.8	5.2	4.4	2.2
Engineering and architectural services	11.4	35.3	33.0	21.9
Research and testing services	.0	159.5	178.7	131.5
Management and public relations	.0	78.3	87.4	60.6
Accounting, auditing, and services, n.e.c.	13.8	42.7	43.1	31.1

(See table 4 for the primary defense-related industries.) But some of the affected industries will surely come as a surprise: wholesale trade, personnel supply services, and research and testing services. These industries represent secondary, tertiary, and later rounds of employment impacts, cutbacks in industries which supply the primary defense industries.

Those industries with the largest increases in defense-related employment over the 1977–87 period and the largest declines in defense-generated employment between 1987 and 1997 are shown in table 5.

However, the largest impacts on employment are in Federal civilian government, as cutbacks affect many of the civilian employees managing the

complex defense procurement programs. The remaining industries in table 5 are divided evenly between goods-producing industries and the service-producing area. Generally speaking, within manufacturing, the industries which are expected to be hit the hardest by defense cutbacks are those dealing with clearly military items, such as missiles, and those which deal in high technology equipment used in, or used to develop, advanced weaponry.

Within the service-producing industries, cutbacks in defense spending are expected to have a direct effect on research and testing services, services to buildings, and communications except broadcasting. The services of these three industries were purchased heavily by the Defense Department over the decade of the 1980's as the department has followed the example of many private sector firms by "out-sourcing" for many basic services. The other service-producing sectors heavily affected by defense cutbacks are generally those industries which are indirectly affected, that is, industries which sell substantial amounts of goods and services to those industries supplying the Armed Forces' primary demand for materials.

In short, while declines in job requirements will be great in the manufacturing sector, they will be even greater in the service-producing sector of the economy. Although a few industries will absorb large job losses, the impact on jobs will be broad-based as many industries absorb some job losses as a result of defense cutbacks.

Turning to the effect of defense cutbacks on occupations, virtually every major occupational group will be affected by defense cutbacks. (See table 2.) The largest effects will be on operators, fabricators, and laborers; on precision production, craft, and repair; and on administrative support occupations. This is not surprising, given that these are the largest occupational groups in the economy.

Table 5 presents occupations expected to suffer the most significant reductions as a result of cutbacks in defense spending. The occupations with the largest declines are, for the most part, those requiring lower levels of educational attainment. As a result, workers actually displaced from these occupations may find the re-employment process difficult, at best. On the other hand, many of the occupations are those with potential employment opportunities for replacement.

IN SUMMARY, it should be noted that defense cutbacks have been going on since 1987 and will continue, given current budget plans, at least through 1997. Only about one-third of the expected cutbacks have taken place so far, with two-thirds still to come. Recovery from the 1990–91 recession no doubt has been slowed, at least in part, by the cutbacks in spending and it is likely that future drops in defense spending could well continue to act as a restraint on the rate of economic growth at least through 1997. Managing the defense cutbacks, providing job retraining where needed, and offsetting the dampening effects of the cutbacks on the economy will require some difficult decisions in the coming decade. □

Table 4. **Industries most heavily dependent on defense spending, 1990**

Industry	Defense-related employment as a percent of total employment
Ship building and repairing	78.7
Guided missiles and space vehicles	74.8
Ammunition and ordnance, except small arms	72.8
Aircraft and missile parts and equipment	47.6
Aircraft and missile engines	47.0
Research and testing services	44.5
Broadcasting and communications equipment	41.5
Aircraft	40.0
Small arms and small arms ammunition	32.2
Search and navigation equipment	30.7
Semiconductors and related devices	29.0
Miscellaneous electronic components	20.5
Forgings	20.4
Electrical equipment and supplies, n.e.c.	19.1
Nonferrous foundries	16.6
Miscellaneous transportation equipment	16.2
New nonbuilding facilities, n.e.c.	14.2
Measuring and controlling devices; watches	12.9
Computer equipment	12.9
Industrial machinery, n.e.c.	12.7
Metal services, n.e.c.	12.2
Screw machine products, bolts, rivets, etc.	12.2
Engines and turbines	12.2
Management and public relations	12.1
Personnel supply services	11.8

Footnotes

[1] In this article, all references to data for specific years are on a calendar-year basis.

[2] See *National Defense Budget Estimates for FY 1993*, (Office of the Comptroller of the Department of Defense, March 1992).

[3] All employment and spending levels for 1997 reflect both the proposed spending cuts of the Bush Administration and additional cuts suggested by President Clinton in his State of the Union address of Feb. 17, 1993. In that address, President Clinton called for a further cutback of $76 billion in defense spending. This study has assessed an even distribution of these nominal dollar cuts over the 1994–97 period.

[4] It is important to note that a decline in job requirements need not necessarily translate into fewer jobs in the economy or into unemployment; other factors of demand, such as exports or personal consumption, could offset this decline.

[5] Although defense expenditures were lowest in 1976, these estimates are for 1977 because that year coincided with the year for which complete data were available. However, the difference between defense spending in 1976 and 1977 is negligible.

[6] The procedure used in this estimation process cannot account for the fact that some military contractors who expect cuts in future contracts or nonrenewal of existing contracts may allow their employment to fall sooner than do actual contract expenditures. To the extent the BLS methods fail to account for these types of job losses, the timing will be affected, but not the overall impact. Thus more than one-third of the anticipated private job loss may already have taken place.

Table 5. **Industries and occupational groups with the largest change in levels of defense-related employment, 1977–87 and 1987–97**

[In thousands]

Industry or occupation	1977–87	1987–97
Industry		
Federal general government	163.0	–200.0
Wholesale trade	108.1	–117.8
Aircraft	68.6	–116.2
Search and navigation equipment	48.2	–75.2
Guided missiles and space vehicles	72.4	–66.0
Aircraft and missile engines	44.3	–65.3
Eating and drinking places	77.3	–58.6
Trucking and warehousing	46.7	–53.1
Maintenance and repair construction	51.7	–48.7
Aircraft and missile parts and equipment	63.6	–47.2
Miscellaneous electronic components	44.5	–46.4
Ship building and repairing	18.6	–44.3
Computer equipment	34.7	–42.3
Personnel supply services	148.3	–42.0
Semiconductors and related devices	56.0	–41.1
Occupational group	**1987–97**	**1992–97**
All other sales and related workers [1]	–64.7	–43.9
Secretaries, except legal and medical	–58.6	–43.8
All other assemblers and fabricators [2]	–56.5	–33.8
Blue-collar worker supervisors	–52.3	–31.5
Janitors and cleaners, including maids/housekeeping, cleaners	–44.0	–33.1
All other, helpers, laborers, and material movers, hand [3]	–43.1	–30.3
Inspectors, testers, and graders, precision	–42.2	–24.5
General managers and top executives	–41.7	–30.2
Truck drivers, light and heavy	–40.0	–27.0
Bookkeeping, accounting, and auditing clerks	–35.7	–26.9
Electrical and electronics engineers	–35.0	–19.0
General office clerks	–33.6	–25.1
All other engineers [4]	–28.5	–14.9
Electrical and electronic assemblers	–27.9	–16.9
Electrical and electronic equipment assemblers, precision	–24.3	–14.3

[1] Excluding cashiers, counter and rental clerks; insurance salesworkers; real estate agents, brokers, and appraisers; retail salespersons, securities and financial services salesworkers; stock clerks, sales floor; and travel agents.

[2] Excluding cannery workers, coil winders, tapers, and finishers; electrical and electronic assemblers; machine assemblers, metal pourers, and casters, basic shapes; portable machine cutters; solderers and brazers; and welders and cutters.

[3] Excluding freight, stock, and material movers, hand; hand packers and packagers; helpers, construction trades; machine feeders and offbearers; parking lot attendants; refuse collectors, service station attendants; and vehicle washers and equipment cleaners.

[4] Excluding the following engineers: aeronautical and astronautical; chemical; civil (including traffic engineers); electrical and electronics; industrial (except safety engineers); mechanical; metallurgists and metallurgical, ceramic, and materials; mining (including mine safety engineers); nuclear; and petroleum.

APPENDIX:

Historical data exist for real defense purchases of goods and services in the National Income and Product Accounts data published by the U.S. Department of Commerce. Proposed Defense Department outlays, based on budget documents and public policy statements, are available from a variety of Defense Department sources. The outlay data are converted to national accounts current-dollar concepts by applying the average of the ratio between the national accounts and defense series computed over the past 10 years. The resulting current-dollar national accounts expenditure data was then deflated with projected defense spending deflators derived from the implicit price deflator projections section of the Data Resources Inc. Comprehensive Quarterly Model of the U.S. Economy. [1]

The Defense Department outlay estimates are currently based on former President Bush's proposed spending cutbacks. The estimates have been modified to reflect additional spending cuts proposed by the Clinton Administration—an additional $60 billion in cuts spaced over the 1994–97 period.

In employment terms, former President Bush proposed a drop in the military force level from 2.2 million in 1987 to 1.6 million by 1997. President Clinton has proposed a further 200,000 cut in force levels, allowing the military to drop to 1.4 million by 1997. Defense Department analyses estimate that under either set of proposed cutbacks, civilian defense employment will drop by a total of about 200,000 employees between 1987 and 1997.

To evaluate the impacts on private sector employment, the Bureau of Labor Statistics used detailed employment requirements tables from its historical and projected industry input–output data base. The employment requirements table allowed us to estimate all of the direct and indirect impacts on industry employment associated with any postulated level and distribution of final demand. For example, for the Defense Department to buy a guided missile, some direct employment in the guided missile and space vehicle industry is required. In addition, some secondary employment is generated in all the industries which supply the

primary industry, including other manufacturing and service industries. Input–output tables and associated employment requirements for 1977, 1987, and 1990, are part of the data system used by BLS. In addition, BLS has projected the input-output structure of the U.S. economy in 2005.[2] Estimates of the employment requirements structure of the economy for 1997 were interpolated from the 1990–2005 change in technical production requirements and changes in labor productivity embodied in those projections.

To translate industry employment into occupational employment, the Bureau of Labor Statistics has developed a detailed matrix of the occupational content of industries and has projected that matrix to 2005 as a part of its ongoing projections program. The 1990 staffing patterns were used to estimate the occupational impacts of defense expenditures for 1987 and 1992, while the 1997 industry employments were distributed to occupational detail with a staffing pattern matrix which was derived as a linear interpolation between actual 1990 estimates and the projected 2005 relationships.

This article does not attempt to estimate the job losses which could occur as incomes are lowered as a result of those who actually lost jobs due to lower defense spending, the so-called multiplier effect. The effects of lost reinvestment of profits and the reduced investment requirements resulting from reduced production needs also were not taken into account in this analysis.[3]

Footnotes to the appendix

[1] The DRI Comprehensive Model of the U.S. Economy is fully described in *Model Documentation: Theory, Properties, and Coverage*, March 1990. The model was fully re-estimated in early 1992 to take account of later data and the benchmark of the National Income and Product Accounts released in January of that year. The modifications to the model are described in Mark Lasky, Chris Probyn, and Joyce Yanchar, "Introducing the 92A Version of the DRI/McGraw-Hill Model of the U.S. Economy," *DRI/McGraw-Hill U.S. Review*, August 1992, pp. 34–40.

[2] The BLS regularly prepares projections of interindustry flows of goods and services and related employment projections by industry and occupation. The latest projections were published as a series of articles in the November 1991 issue of the *Monthly Labor Review* and were reprinted, along with detailed statements of methods and assumptions, in *Outlook 1990–2005*, Bulletin 2402 (Bureau of Labor Statistics, May 1992). Underlying the projections is a program of detailed historical data estimation and maintenance. Input–output tables and associated employment requirements tables have been prepared in a consistent definitional framework and dollar base for the years 1977, 1982, 1987, and 1990. These tables are available at nominal cost from the BLS.

[3] The most recent prior examination of the relationship between defense spending and employment in the private sector of the economy was Norman C. Saunders, "Defense spending in the 1990's—the effect of deeper cuts," *Monthly Labor Review*, October 1990, pp. 3–15. This article examined spending to the year 2000, but did not explicitly tie defense spending assumptions to specific budget goals of a current administration.