

Economic Commentary

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Military Spending and the Economic Outlook

by Michael F. Bryan and Owen F. Humpage

The United States is embarking on an unprecedented increase in peacetime military spending. The program has prompted heated discussions about the implications of defense spending for real output, employment, and prices. Many economists expect the defense buildup to have a relatively small, yet significant, impact on real *aggregate* economic activity and price levels over the next few years. Nevertheless, the direct impact of increased military spending on some sectors, such as durable goods, and specific prices should be of much greater significance.

Following the Vietnam War, U.S. defense spending declined in real terms, as a percentage of the total federal budget and relative to GNP. In FY 1978 real defense expenditures constituted 24 percent of total federal expenditures, having fallen from their last peak level of 44 percent in FY 1968. Real defense spending equaled 5 percent of GNP in 1978, down from 10 percent a decade earlier.

Military spending started to rise sharply again beginning in FY 1979. In response to its NATO commitments and developments in the Middle East, the Carter administration increased real military expenditures 3.9 percent in FY 1979 and 3.4 percent in FY 1980 and proposed to raise real military spending at a 5.0 percent average annual rate through FY 1985. The Reagan administration greatly augmented the Carter administration's defense-spending proposals. Real military spending now officially is expected to increase at an average annual rate of 8.6 percent through FY 1986, equaling approximately 7 percent of total GNP by then. Al-

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The views stated herein are those of the authors and not necessarily those of the Federal Reserve Bank of Cleveland or of the Board of Governors of the Federal Reserve System.

though the military-spending increases will cover a broad range of budget categories, over one-half will be used for procurement. Most of the procurement funds will be spent on aircraft, ships, missiles, and other combat vehicles.

The Military Spending Process

Long and variable lags often exist between a presidential request to increase military spending and an observed change in defense purchases as recorded by the GNP accounts. They depend on many factors, including the nature of the goods being bought, the capacity of the defense industry, and the urgency of the need. One can identify three lags in the military-spending chain. Production and employment can occur at any point along this chain.

The first two lags involve the budget process. There is a time lapse between the date when the president proposes an increase in military outlays and the date when Congress actually appropriates funds for the coming fiscal year. Measured from the January budget, this lag could be as short as four months or as long as nine months. Between 1975 and 1980, however, the average lag was seven and one-half months. There also may be a time lag between the date when the Department of Defense receives its appropriation and the time when it awards contracts. The lags associated with the budget process and with the issuance of prime-contract awards currently do not appear to represent major delays because of the widespread support throughout Congress for increased military spending.

The final lag in the military-spending process occurs between the awarding of prime contracts and the delivering of military goods. On average between 1960 and 1979, changes in military prime-contract awards resulted in significant changes in deliveries in

on financing the military buildup. This argument involves two links. The first link maintains that the administration will not be able to achieve simultaneously large increases in military spending and reductions in taxes and the deficit. Although the administration anticipates a \$45-billion deficit in FY 1982 and a balanced budget by FY 1984, most private forecasters anticipate a larger deficit in FY 1982—possibly as high as \$70 billion. A large deficit in FY 1982 would reduce the chances for a balanced budget in FY 1984.

The second link in the inflation argument is that deficits are routinely accompanied by increases in the money stock. When the government borrows from private credit markets to finance its deficits, it places upward pressure on interest rates. It often is alleged that the Federal Reserve, because of its concern over high interest rates, accommodates some or all of the federal government's credit demands by purchasing government debt through open-market operations and increasing the money stock. Causality tests suggest that a positive, weakly significant, correlation exists between Treasury borrowing from the public and the Federal Reserve System's holdings of government debt; however, no causal relationship was found between Treasury borrowing from the public and the money supply (M-1B).³ These results suggest that although the Federal Reserve makes some open-market purchases in response to Treasury borrowing, this amount is not large enough to dominate movements in the money supply, which is influenced by other factors.

These causality tests can measure only persistent correlations between deficits and money that cause inflation. They may not detect periodic short-run relationships, pro-

3. The causality tests were conducted by first converting quarterly time-series data to "white noise" following Box-Jenkins techniques and then investigating the correlations between the appropriate "whitened" series. The time period was usually 1959 to 1980. These are preliminary results of a forthcoming study on deficits and inflation by Michael L. Bagshaw and Owen F. Humpage; details are available on request. See L.D. Haugh, "Checking the Independence of Two Covariance Stationary Time Series: A Univariate Residual Cross-Correlation Approach," *Journal of the American Statistical Association*, vol. 71 (June 1976), pp. 378-85.

ducing temporary or one-shot increases in overall price levels.

Deficits also may cause increases in the absolute level of prices if they are accompanied by increases in the velocity of money (evidence of a decline in money demand relative to output). Such velocity changes may occur if the public perceives government debt as net wealth, or if the debt is issued in short maturities and increases the liquidity of the average wealth holder. The perceived increase in wealth or greater liquidity of wealth could enable individuals to economize on their money balances, i.e., to support a greater volume of expenditures with a smaller stock of money balances. Causality tests show a positive correlation between Treasury borrowing and the velocity of money (M-1B); however, the relationship is not strong.

Another argument relating recent defense-spending proposals and inflation concerns the real-resource requirements of the program. A military buildup, this argument contends, transfers resources to the less productive defense sector while simultaneously maintaining aggregate employment and income. The supply of aggregate real output slows, while demand remains unchanged; prices ratchet upward as long as the resource transfer continues.

There are, however, many extenuating circumstances. The argument, for example, assumes that all resources are fully employed so that increased production of private and defense goods cannot be achieved simultaneously. The economy often operates at less than its potential, as is currently the case. In addition, the full-employment level of output is not unchanging in a dynamic economy. It depends on the structure of prices and wages, taxes, government regulations, and many other institutional arrangements. An increase in aggregate supply is conceivable, particularly if the government increases incentives for investment and productivity growth.

The extenuating circumstances, however, need not rely on supply-side economic arguments. Most importantly, if the military buildup is accompanied by a reduction in nondefense federal spending or a lower rate of monetary growth, aggregate price pressures associated with the resource transfer

would be mitigated. Despite the defense-spending increases, the Reagan administration intends to reduce the relative size of total federal spending to 21.2 percent in FY 1986 from 22.6 percent in FY 1980, and the Federal Reserve System expects to lower gradually the rate of money growth over the same period. Such policies, to the extent that they lower the growth in real private-sector demand, will reduce the aggregate price pressures associated with the transfer of resources to the defense sector.

In summary, the relationship between military spending and inflation is not direct. The results depend on the conduct of monetary policy and the ability of the fiscal authorities to lower nondefense federal spending and encourage private-sector productivity.

Will Bottlenecks Result in Price Pressures?

In a free-market economy, relative prices rise and fall to adjust quantities of goods and services demanded to the amounts being supplied. When demand for a specific product increases, the relative price of that good also will increase, forcing conservation in its use and encouraging expansion of its production. The choice to increase military ex-

penditures enjoys no reprieve from the laws of the marketplace.

At the present time, there appears to be enough excess capacity among the major defense industries to support an expansion of production. Bottlenecks, however, are developing among some defense subcontractors, particularly in low-technology industries such as large-scale castings and forgings. As military spending slowed during the 1970s, defense-related production became less profitable, causing an exodus of defense subcontractors into civilian manufacturing. For many of these defense subcontractors, the federal government was their only buyer. Given time and a constant government demand, the subcontracting network will be reactivated, but in the meantime bottlenecks in the subcontracting network will raise prices of defense resources and lengthen lead times for delivery of defense goods. There may also be shortages of individuals with specific defense-related skills, forcing specific wage rates up. Shortages and bottlenecks that cause relative price shifts, however, will not cause inflation if the Federal Reserve does not accommodate them. They will, however, reduce the real value of defense spending and private spending on defense-related resources.

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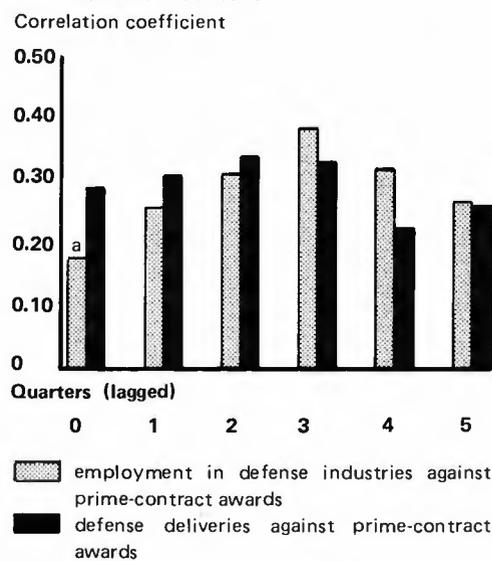
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the current quarter and subsequent five quarters (see chart 1). The strongest correlation occurred in the second and third quarters following a change in prime-contract awards. Small weapons, clothing, cars, and trucks can be delivered almost immediately. More sophisticated equipment requires longer lead times; some equipment surely takes much longer than five quarters.

Deliveries, however, are a poor indicator of the economic activity caused by military spending. Investment in plant and equipment and inventory accumulation of supplies may precede contract awards if firms are certain of future government orders. Production may immediately follow contract awards, and may quicken to a full pace if not hampered by production bottlenecks or resource shortages. As production proceeds, items

Chart 1 Correlations of Select Defense Indicators against Current and Lagged Prime-Contract Awards



a. Insignificant at the 95 percent confidence level; lags beyond five quarters also are insignificant at the 95 percent confidence level.

Contracts: Quarterly average of monthly prime-contract awards deflated by the GNP deflator for government purchases.

Deliveries: Government purchases less compensation (NIPA basis) deflated by the GNP deflator for government purchases.

Employment: Quarterly average of monthly employment in defense industries.

Method: Described in footnote 3 of the text.

Interval: 1960:1Q to 1979:1VQ.

appear in the GNP accounts as inventories. Employment typically follows contract awards with a one-quarter lag, as shown in chart 1. Employers prefer to utilize their existing work force more intensively before incurring the additional expense of new employees. When deliveries finally are made, they appear in the GNP accounts as increases in defense purchases but are matched by offsetting declines in inventories.

Given the concentration of large procurement items in the recent military-spending proposals and given the likelihood of production bottlenecks and shortages, the production processes may extend longer than past experience suggests. The same factors responsible for longer lead times may induce additional plant and equipment spending, since the U.S. commitment to increase defense spending appears firm.

Recent Developments

The increase in military spending thus far has been small relative to what is anticipated. Between 1978:1VQ and 1981:11Q, for example, real defense spending only increased from 4.5 percent to 4.8 percent of total GNP. In addition, the increases seem to reflect Department of Defense employment and purchases of standardized goods and services rather than major procurement items.

A review of various "defense indicators" shows that economic activity has picked up somewhat in response to higher military spending, but the increases in orders, production, and private-sector employment have been small and inconsistent (see table 1). Military prime-contract awards and manufacturers' new orders for defense products have demonstrated large percentage increases (greater than one standard deviation above the mean) somewhat more often since January 1979 than over the previous three years. These large increases, however, have not occurred with any regularity, and they often have been followed by declines in prime-contract awards and new orders. Likewise, manufacturers' unfilled orders for defense products have not risen in a manner suggesting a strong, persistent increase in military spending. The frequency of large increases in industrial production of defense goods has not increased since early 1979, but there was a fairly consistent string of

Table 1 Frequency of Large Increases in Defense Indicators

	Prime-contract awards	New orders	Industrial production	Inventories	Unfilled orders	Shipments	DOD employment	Employment
1975:12 to 1978:12	0.10	0.14	0.20	0.08	0.17	0.10	0.14	0.16
1979:1 to latest available data point ^a	0.24	0.24	0.07	1.00	0.14	0.28	0.33	0.18
	(1981:1)	(1981:5)	(1981:5)	(1981:4)	(1981:4)	(1981:5)	(1980:12)	(1981:3)

a. Dates in parentheses designate the latest month for which data are available.

Methodology: Because the defense-indicator series are erratic from month to month or quarter to quarter, trends in the series are difficult to discern. Consequently, a six-month moving average of monthly percentage changes was calculated for various defense indicators. The mean and standard deviation of the moving-average time series for each defense indicator were calculated over the 1975:12 to 1978:12 period. Next, a count was made of the number of times the percentage increase in a given defense indicator exceeded one standard deviation above the mean (as calculated over 1975:12 to 1978:12). The table shows this count for two subperiods; in each case the count was divided by the number of months in the subperiod. The data pertain only to defense industries unless otherwise indicated.

modest increases (greater than average, but less than one standard deviation above average) in late 1980 and early 1981.

In contrast to production and orders, inventories suggest that firms are preparing for anticipated future military-production increases. Inventories of defense products have shown larger percentage increases in every month since January 1979. Inventories include materials, goods in process, and final products, but the lack of significant increases in defense-goods production suggests that much of the increase in defense-related inventories reflects the accumulation of basic materials or components rather than final defense products. The increased frequency of large gains in shipments of defense products also may mirror the rise in inventories, since shipments include inter-plant transfers within multi-plant firms.

Employment by the Department of Defense (military and civilian) has shown persistently large increases since early 1980, but employment in private-sector defense industries gives only a slight indication of a significant rise. Typically, however, employment gains lag a rise in production.

Regional Impacts

The defense-production sector of the economy is highly concentrated among relatively few firms within specific geographic areas. The initial production and employment triggered from increased defense spending are, however, only the first

links in a long chain of economic activity. Investment induced by defense spending creates demand in states that produce durable goods, and the income earned by defense workers eventually will be spent on nondefense products. These effects distribute the economic stimulus associated with additional defense spending more evenly throughout the nation.

Between 1978 and 1980, over one-half of the total value of all military prime-contract awards involved aircraft, missiles, and ships (see table 2). These industries are characterized by highly technical, large-scale production facilities and a high degree of industrial and regional concentration. Nine aircraft firms, eleven missile producers, and eight shipbuilders received virtually all of their respective industries' military prime-contract awards between 1978 and 1980. More than 20 percent of the total value of Department of Defense contracts during the last three years was awarded to five corporations; 47 percent was received by 25 firms.

Between 1978 and 1980, firms in six states received over one-half of the military prime-contract awards. Firms in California were the overwhelming leaders, receiving approximately 20 percent. Two-thirds of all aircraft-contract awards went to firms in California, Texas, and Missouri; one-half of the shipbuilding contracts were awarded to firms in Virginia, Connecticut, and California, and three-fifths of the missile and

Table 2 Concentration of Military Prime-Contract Awards^a

Industry	Percent	State	Percent	Corporation	Percent
Aircraft	23.3	California	20.2	General Dynamics	5.7
Missiles and other space systems	13.7	New York	8.5	McDonnell Douglas	4.7
Ships	10.7	Texas	8.2	United Technologies	4.0
Vehicles	4.0	Connecticut	6.3	Lockheed	3.1
Others	20.6	Missouri	5.4	General Electric	3.0
Total hard goods	72.3	Massachusetts	5.3	Subtotal	20.5
Other supplies	27.7	Subtotal	53.9		
Total	100.0	Pennsylvania	3.2	6-10	11.2
		Ohio	2.4	11-25	14.8
		Kentucky	0.3	26-50	11.2
		West Virginia	0.1	51-100	9.0
		District total	6.0	Total	66.7

a. Data averaged annually, 1978 through 1980; 100 corporations receiving largest dollar volume of prime-contract awards.

SOURCE: U.S. Department of Defense.

space-systems contracts went to firms in California and Massachusetts. In contrast, firms located in states of the Fourth Federal Reserve District (Kentucky, Ohio, Pennsylvania, and West Virginia) received only 6 percent of the total prime-contract awards.¹ Recipients of military prime-contract awards typically do not perform all of the work entailed in the contract; they subcontract much of the work to other firms. Although subcontracting slightly diffuses the initial impact of defense spending, the subcontracting network seems nearly as regionally concentrated as the primary-contract network. In 1966, for example, 75 percent of all military subcontracting occurred in ten states, with California and New York accounting for 40 percent.² The subcontracting network, however, is not immutable. Given the size and the technical nature of projected defense spending and the likelihood of pro-

1. Apparently Ohio's industries are an increasingly smaller source of Department of Defense procurement. Between 1958 and 1962, Ohio's industries received 4.5 percent of the total military prime contracts and 7.7 percent of total aircraft awards. In 1980 defense contracts in Ohio equaled 2.4 percent of the total, a historical low, and its aircraft awards fell to 3.4 percent. Ohio's industries, however, are more important in defense subcontracting than in primary contracting.

2. See Murray Weidenbaum, *The Economics of Peacetime Defense* (Praeger Publishing, 1974), p. 116.

duction bottlenecks, additional firms may seek defense-related orders and reduce the regional concentration in the subcontracting network.

The stimulative effects of the military prime-contract awards and subcontracting eventually will affect incomes throughout the country. The military spending increases, however, will be financed in part by cuts in federal nondefense spending categories. Both the defense and the offsetting nondefense budget developments must be weighed in assessing regional impacts of the budget. On balance, the military buildup may result in large relocations of employment, investment, and income, and not all regions may benefit.

Military Spending and Inflation

Many economists caution that the administration's defense-spending program will result in higher rates of inflation. *Inflation*, or a *persistent* rise in the *overall* price levels, cannot exist without an equally persistent rise in the supply of money or a decline in the demand for money that outpaces the growth of goods and services. Factors that reduce the demand for money, such as readily available credit, and factors that reduce the aggregate growth of real output, such as slowdowns in long-term productivity growth, result in inflation only if they are not offset by monetary policy.

One argument relating recent defense-spending proposals to inflation concentrates