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TECHNICAL REPORT

# How Much Does Military Spending Add to Hawaii's Economy?

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Prepared for the Office of the Secretary of Defense

Approved for public release; distribution unlimited

A RAND study in cooperation with Hawaii Institute of  
Public Affairs and The Chamber of Commerce of Hawaii



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## Summary

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Defense activity in Hawaii may account for a significant portion of Hawaii's economic activity, but the extent of this association has not been assessed since the publication in 1963 of a study of the relationship between defense jobs and employment in Hawaii. Therefore, the Hawaii Institute of Public Affairs and the Military Affairs Council of the Chamber of Commerce of Hawaii asked RAND to assess the relationship between DoD spending in Hawaii and the levels of output, employment, and earnings in Hawaii's economy.

RAND researchers first collected data on defense spending in Hawaii in FY 2007–2009 and then analyzed the data using the regional input-output model for Hawaii, which is maintained by the Bureau of Economic Analysis (BEA) of the U.S. Department of Commerce and was most recently updated with 2006 data. Data on defense personnel and procurement were obtained from the Defense Manpower Data Center and the Federal Procurement Data System. Personnel data comprise expenditures for active-duty personnel serving in Hawaii, members of the Hawaii Selected Reserve, and DoD civilian employees, as well as retirement benefits paid to military retirees residing in Hawaii. Defense procurement expenditure data include all contracts greater than \$3,000 in which Hawaii is designated as the principal place of performance.

An input-output model describes relationships among the industries in an economy and an end-use (final) demand. The model assumes that production functions are linear, have constant returns to scale (doubling inputs doubles output), and use inputs in fixed proportions. It does not treat price adjustments in input and output markets or changes in technology. Our analysis assumes that when defense procurement and personnel dollars enter Hawaii's economy, they follow the same relationships among industries as reflected in the model. Because the model's coefficients and multipliers describe associations between final demand and output rather than causal effects, the model is useful for assessing the relationship between defense spending and Hawaii's output, earnings, and employment, but it does not consider the effect of changes in defense spending on the economy.

In this study, we treated defense spending as an end-use demand. Defense spending on procurement has a direct impact on industries in which the procurement occurs and an indirect impact on other industries. Each procurement record contains an industry code and descriptors that allowed us to map procurements to the 60 industry classes in the model. Spending on personnel acts in a similar way. DoD personnel and retirees use their wages and benefits to purchase goods and services that generate further economic activity. Data on the consumption patterns of defense personnel are not available, so we used the consumption profile in the Hawaii input-output model, adjusting it with regard to healthcare expenditures, the outflow from Hawaii of housing allowance dollars paid for privatized military housing, and per diem payments to military personnel en route to or departing from Hawaii. We used the adjusted

profile to allocate defense spending on personnel to industry classes, and we adjusted the procurement profile to include DoD expenditures on the healthcare of defense personnel.

We estimated that DoD expenditures in Hawaii during FY 2007–2009 averaged \$6.527 billion per year in 2009 dollars—\$4.074 billion for personnel and \$2.452 billion for procurement.

The expenditures were associated with \$12.220 billion of output in Hawaii's economy, \$3.506 billion in earnings, and full-time equivalent (FTE) employment of 101,533 people (Table S.1). The output constituted 18.4 percent of Hawaii's 2009 gross domestic product (GDP). These figures may be somewhat high, however, because of data limitations noted below.

Table S.1 also shows the average multipliers for defense spending. These are summary measures of the relationship between defense spending and output, earnings, and employment. The output multiplier for total spending (1.87) was obtained by dividing the \$12.220 billion in output by the \$6.527 billion total of defense spending. That is, each dollar of defense expenditure was associated with an additional 87 cents worth of output. The earnings multiplier (0.54) reflects the earnings associated with each dollar of defense expenditure. It does not include the earnings of defense personnel. The employment multiplier (16.52) indicates that 16.5 jobs were associated with each million dollars of defense expenditure. Multipliers for personnel and procurement expenditures are also given in Table S.1.

We considered the sensitivity of the estimates to a number of factors, including undercounting or overcounting defense procurement, Hawaii state taxes paid by defense personnel, the savings rate of defense personnel, Impact Aid to Hawaii schools, spending by afloat and deployed personnel, and procurement by commissaries and exchanges. The sensitivity analysis suggested that two factors, the savings rate of personnel and where the earnings of afloat and deployed personnel are spent, could decrease the results by approximately 10 percent. In addition, the consumption profile for defense personnel may not be fully accurate, as it was not specifically derived for them. Collection of original data and further analysis would be required to resolve these data limitations.

Finally, although the input-output model can provide a good assessment of the relationship between defense spending and Hawaii's output, earnings, and employment, we caution against using it as a basis for estimating the effect of a given increase or decrease in defense spending on the economy. An analysis of such a change should be based on a detailed struc-

**Table S.1**  
**Impact of Defense Expenditures on Hawaii's Economy**

	Personnel	Procurement	Total
DoD expenditure (2009 \$billions)	4.074	2.452	6.527
Final-demand output (2009 \$billions)	7.439	4.781	12.220
Final-demand earning (2009 \$billions)	1.957	1.549	3.506
Final-demand employment	61,902	39,631	101,533
Average multiplier			
Final-demand output	1.83	1.95	1.87
Final-demand earnings	0.48	0.63	0.54
Final-demand employment	16.13	17.16	16.52

NOTE: The employment multiplier is FTE employment per million dollars of expenditure in 2006 dollars (see Chapter Four).

tural model of the industries affected by the change, although this is not always practicable. Nevertheless, we caution that a \$1.00 increase in defense spending will not necessarily increase Hawaii's output by \$1.87.