December 2011

Economic Impacts Attributable to FY 2011 Federal Grants and Payments to Seven Insular Areas

Final Report

Prepared for

Office of Insular Affairs
U.S. Department of the Interior
1849 C Street, NW
Washington, DC 20240

Prepared by

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Research Triangle Park, NC 27709

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CONTENTS

Appendix

LIST OF TABLES

EXECUTIVE SUMMARY

The Office of Insular Affairs (OIA) carries out the Department of the Interior's responsibilities for U.S.-affiliated insular areas. These areas are the territories of American Samoa, Guam, the U.S. Virgin Islands, and the Commonwealth of the Northern Mariana Islands as well as the Freely Associated States (FAS)[1] of the Federated States of Micronesia, the Republic of the Marshall Islands, and the Republic of Palau.

OIA provided $451 million in grants and payments to the insular areas during FY 2011. This assistance played an important role in the economies of each of these areas by providing financial and technical assistance to promote economic growth, education, public health, and the development of more efficient and effective government. Because of a lack of sophisticated economic data series, such as input-output tables, for these insular areas, territorial and federal leaders are largely deprived of the type of thorough economic analysis that would assist them in making more informed policy decisions.

OIA contracted with RTI International to develop a methodology that, despite data limitations, estimates the economic impact of OIA grants and payments to the insular areas. To meet OIA's needs, RTI canvassed existing secondary data and provided OIA with a methodology for rapidly approximating the economic impact of OIA payments. This methodology was used to estimate the impact of payments on each of the following economic aggregates for each insular area:

- Employment: the number of individuals gainfully employed, which typically consists of full-time and part-time employees but excludes subsistence agriculture and fishing
- Employee compensation: payments made to all employees during the year, including salaries, wages, and other forms of compensation
- Gross domestic product (GDP): a measure of each area's economic output—typically defined as the value of all final goods and services made within the borders of the insular area in a particular year

Table ES-1 summarizes the results of this analysis.

[1] FAS are independent nations that were at one time governed by the United States and continue to maintain a close relationship with the United States through the Compact of Free Association, which makes them eligible to receive funds and assistance from U.S. federal agencies.

Table ES-1. Economic Impact Summary of OIA Grants and Payments (FY 2011)

	Total OIA Payments ($'000, 2010$)	Total OIA Employment Impact (#)	National Employment Supported by OIA Payments (%)	Total OIA Employee Compensation Impact ($'000, 2010$)	National Employee Compensation Supported by OIA Payments (%)	Total OIA GDP Impact ($'000, 2010$)	National GDP Supported by OIA Payments (%)
American Samoa	35,176	1,752	11%	23,067	13%	81,103	11%
Guam	73,518	4,918	7%	128,237	8%	328,392	7%
Northern Mariana Islands	16,292	1,369	5%	17,036	5%	35,702	5%
U.S. Virgin Islands	105,691	9,043	20%	262,710	18%	857,203	20%
Micronesia	110,644	8,483	55%	47,234	72%	145,884	55%
Marshall Islands	71,558	4,215	41%	43,740	44%	63,637	41%
Palau	15,677	1,584	14%	19,500	20%	22,858	14%
Total	**428,555**	**31,364**	**16%**	**541,523**	**14%**	**1,534,778**	**14%**

Note: Approximately $22.3 million of the total $451 million was spent outside the seven insular areas that were the primary focus of this study.

Source: RTI estimates.

ES.1 FY 2011 OIA Payments to the Insular Areas

OIA's responsibilities are framed by the long-term security interests of the United States in the western Pacific and serious economic and fiscal problems affecting the U.S. territories. Although each territory's situation is unique, they share common challenges, including limited land and resources, small populations, limited local technical expertise, narrow economic bases, and exposure to natural disasters, such as hurricanes and typhoons. OIA strives to empower the local communities, foster economic development, promote sound management, and improve quality of life while respecting and preserving local cultures.

U.S. per capita GDP was estimated to be approximately $46,504 in 2009 when adjusting for inflation to 2010 dollars (World Bank, 2011a). By contrast, per capita GDP for the insular areas averages to less than $20,000, although there is great variability in income across areas (Table ES-2). GDP per capita is lowest in the three FAS areas, ranging from $2,400 in Micronesia, to $2,900 in the Marshall Islands, to $8,300 in Palau. In addition, 2009 GDP per capita is relatively greater in the four U.S. territories, ranging from $8,100 in American Samoa, to $17,000 in the Northern Mariana Islands, to $26,000 in Guam, to $41,000 in the U.S. Virgin Islands.

Table ES-2. Economic Characteristics by Insular Area (2010)

	Estimated Population (#)	Estimated Employment (#)	Estimated Employee Compensation ($'000, 2010$)	GDP ($'000, 2010$)	GDP per Capita (2010$)
American Samoa	55,519	15,434	181,812	714,531	10,193
Guam	159,358	68,363	1,596,381	4,564,665	25,659
Northern Mariana Islands	53,883	27,897	355,350	727,744	14,131
U.S. Virgin Islands	106,405	45,495	1,447,841	4,312,597	36,860
Micronesia	111,064	15,418	65,670	265,148	2,402
Marshall Islands	54,038	10,320	98,887	155,800	2,883
Palau	20,472	11,678	99,615	168,522	8,331
United States	308,745,538				46,504

Note: 2010 population estimates were obtained from the 2010 U.S. Census (2011a) and the World Bank (2011b). Data on estimated 2009 GDP and GDP per capita for the four U.S. territories were collected from BEA (2011) and are presented in real 2010 terms. Data on estimated 2008 population, GDP and GDP per capita were obtained for the three FAS from World Bank (2011a, 2011b). Finally, 2009 GDP per capita for the United States was from the World Bank (2011a, 2011b). RTI constructed estimated employment and employee compensation statistics from the most recent secondary sources available and represent various years. The construction of this data for each insular area is explained in more detail in the full report.

For FY 2011, OIA provided $451 million in technical assistance, grants, and payments to the insular areas, of which a large majority is considered mandatory, essential assistance to provide basic services or defined by law, while only a small percentage is considered discretionary (OIA, 2011b). OIA payments fund health care, education, government operations, roads, and other types of social and physical infrastructure. From a budgetary standpoint, payments can be separated into three primary categories (Table ES-3):

- *fiscal payments*, which are the return of taxes collected by the U.S. federal government to Guam and the U.S. Virgin Islands, as required by law
- *Assistance to Territories*, which provides general technical assistance, finances education and health care operations, funds and maintains essential infrastructure, and supports environmental initiatives, including brown tree snake control and the Coral Reef Initiative
- *Compact of Free Association*, which distributes annual payments to FAS, per their treaties with the United States, and provides support to the U.S. western Pacific territories and Hawaii to offset the impact the Compact has on regional social infrastructure

Table ES-3. FY 2011 OIA Payments by Insular Area

	Assistance to Territories ($'000, 2010$)	Compact of Free Association—Current ($'000, 2010$)	Compact of Free Association—Permanent ($'000, 2010$)	Fiscal Payments ($'000, 2010$)	Total OIA Payments ($'000, 2010$)
American Samoa	35,162	—	14	—	35,176
Guam	11,691	—	16,827	45,000	73,518
Northern Mariana Islands	14,362	—	1,930	—	16,292
U.S. Virgin Islands	5,691	—	—	100,000	105,691
Micronesia	2,011	1,577	107,056	—	110,644
Marshall Islands	3,512	2,077	65,969	—	71,558
Palau	1,677	14,000	—	—	15,677
Other[a]	11,090	—	11,229	—	22,319
Total	**85,195**	**17,654**	**203,025**	**145,000**	**450,874**

[a] This other category represents payments being spent outside the seven insular areas, such as Washington, DC; Hawaii; and others.

Source: RTI estimates based on detailed budget information provided by OIA (2011a; 2011b).

ES.2 Study Methodology

Total economic impacts are the sum of direct economic impact and indirect/induced economic impact resulting from recipient organizations' consumption of goods and services and household spending by organizations' employees. RTI reviewed employment, employee compensation, and activity trends for each insular area to estimate the direct impact of OIA payments.

Indirect/induced impacts were estimated using economic base analysis (EBA). The reasoning underlying EBA is that an individual region's economic activity is derived from its "base" or "primary" sectors, which are defined as those sectors whose revenue is received primarily from outside the region. Base sectors often include manufacturing, mines, agriculture, and fisheries that produce goods for export and activities that are funded by the U.S. federal government and aid organizations.

RTI's selection of EBA as an analytical strategy was motivated by the importance of offering OIA a methodology for estimating economic impacts that could be applied using data currently available and that could be updated as needed, either for future fiscal years' payments or as new economic data are made available for the insular areas.

In addition to its primary analysis of the seven insular areas, RTI also conducted a supplemental analysis of the economic impact of OIA spending on Washington, DC, and Hawaii. Because input-output statistical data were available for these two areas, RTI used IMPLAN, a static input-output model of economic activity, to quantify the impact OIA spending has on each economic region.

ES.3 Economic Impact Results

Using the analytical methodology described above, RTI estimated the direct, indirect/induced, and total economic impacts of OIA payments on each insular area in terms of employment, employee compensation, and GDP.

Estimates of local employment supported by OIA payments are presented in Table ES-4. Based on RTI's analysis of the economic structure of each insular area, it was determined that for every 1 job directly supported by OIA payments, approximately 1.92 jobs were supported elsewhere in each insular economy, on average. Base employment multiplier estimates ranged from 1.98 in American Samoa to 3.68 in the Northern Mariana Islands.

Table ES-4. Estimated Employment Impact of OIA Payments (FY 2011)

	Direct Employment Impact (#)	Indirect/Induced Employment Impact (#)	Total Employment Impact (#)	National Employment Supported by OIA Payments (%)
American Samoa	885	867	1,752	11%
Guam	1,550	3,368	4,918	7%
Northern Mariana Islands	372	997	1,369	5%
U.S. Virgin Islands	2,551	6,492	9,043	20%
Micronesia	3,050	5,433	8,483	55%
Marshall Islands	1,872	2,343	4,215	41%
Palau	523	1,061	1,584	14%
Total	**10,803**	**20,561**	**31,364**	**16%**

Source: RTI estimates.

In the cases of the Marshall Islands and Micronesia, a significant portion of national employment is directly and indirectly supported by OIA payments. Approximately 55% of total recorded employment in Micronesia was either directly or indirectly supported by OIA payments. These data do not include subsistence agriculture or fishing.

Estimates of the amount of employee compensation supported by OIA payments are presented in Table ES-5. Based on RTI's analysis of the economic structure of each insular area, we determined that for every $1.00 of employee compensation directly supported by OIA payments, approximately $2.00 of employee compensation was supported elsewhere in the insular economy, on average. Base employee compensation multiplier estimates ranged from 2.07 in the Marshall Islands to 4.13 in the Northern Mariana Islands.

Table ES-5. Estimated Employee Compensation Impact of OIA Payments (FY 2011)

	Direct Employee Compensation Impact ('000, 2010$)	Indirect/Induced Employee Compensation Impact ('000, 2010$)	Total Employee Compensation Impact ('000, 2010$)	National Employee Compensation Supported by OIA Payments (%)
American Samoa	10,667	12,400	23,067	13%
Guam	36,388	91,848	128,237	8%
Northern Mariana Islands	4,127	12,909	17,036	5%
U.S. Virgin Islands	81,152	181,558	262,710	18%
Micronesia	15,855	31,378	47,234	72%
Marshall Islands	21,146	22,594	43,740	44%
Palau	6,803	12,697	19,500	20%
Total	**176,139**	**365,384**	**541,523**	**14%**

Source: RTI estimates.

In the cases of the Marshall Islands and Micronesia, a significant portion of national employee compensation is directly and indirectly supported by OIA payments. For example approximately 72% of total estimated recorded employee compensation in the Federated States of Micronesia is either directly or indirectly supported by OIA payments.

Estimates of the amount of GDP supported by OIA payments are presented in Table ES-6. Based on RTI's analysis of the economics of each insular area, we determined that for every $1.00 of GDP directly supported by OIA payments, approximately $2.92 of GDP was supported elsewhere in the insular economy on average. As a result, a significant portion of national employee compensation is directly and indirectly supported by OIA payments. For example, approximately 55% of total GDP in Micronesia is either directly or indirectly supported by OIA payments.

Table ES-6. Estimated GDP Impact of OIA Payments (FY 2011)

	Direct GDP Impact ('000, 2010$)	Indirect/Induced GDP Impact ('000, 2010$)	Total GDP Impact ('000, 2010$)	National GDP Supported by OIA Payments (%)
American Samoa	40,970	40,132	81,103	11%
Guam	103,494	224,897	328,392	7%
Northern Mariana Islands	9,695	26,007	35,702	5%
U.S. Virgin Islands	241,829	615,374	857,203	20%
Micronesia	52,453	93,430	145,884	55%
Marshall Islands	28,261	35,377	63,637	41%
Palau	7,544	15,314	22,858	14%
Total	**484,248**	**1,050,530**	**1,534,778**	**14%**

Source: RTI estimates.

In addition to the analysis of the seven insular areas, RTI also conducted a supplemental analysis of the economic impact of OIA operations in Washington, DC, and Hawaii. RTI estimated that approximately $7.5 million of OIA's operating budget was spent in Washington, DC and approximately $13.3 million in Hawaii for OIA operations and to offset the impact Compact provisions have on Hawaii's social infrastructure. To estimate the economic impacts, RTI used IMPLAN modeling software to construct input-output models of each region. Using these models, RTI estimated that OIA's operations and payments would create approximately 40 employees in Washington, DC, receiving $4.5 million of employee compensation and 184 employees in Hawaii receiving $9.8 million of employee compensation.

SECTION 1
INTRODUCTION

The Office of Insular Affairs (OIA) contracted with RTI International in November 2011 to estimate the economic impacts of federal payments and grants from Fiscal Year (FY) 2011 to U.S.-affiliated insular areas. These areas are the U.S. territories of American Samoa, Guam, the Commonwealth of the Northern Mariana Islands (CNMI), and the U.S. Virgin Islands (USVI) and the freely associated states (FAS) of the Republic of the Marshall Islands (RMI), the Federated States of Micronesia (FSM), and the Republic of Palau.

OIA distributed approximately $451 million in technical assistance, grants, and payments to the insular areas during FY 2011. These payments play an important role in each area's economy, supporting local jobs and providing employee compensation in regions where per capita income is one-half to less than one-quarter of that of the United States ($46,504 in 2009 [2010$]). The economic characteristics of these areas are displayed in Table 1-1.

Because the insular areas are not included in most U.S. statistical surveys of economic activity, critical data on local economic activity are not captured. As a result, federal and insular officials do not have detailed economic data with which to inform their policy decisions, including input-output (I/O) and other data necessary for measuring the economic impact of federal grants and payments with the same level of precision and accuracy available for U.S. states.[1]

In this study, RTI estimated direct economic impacts and multipliers for estimating total economic impact, which includes indirect and induced impacts, for each of the seven insular area's economies. Analysis results were designed to be integrated into a larger report that estimates the economic benefits of lands and other resources managed by the Department of the Interior, thus enabling OIA to report on its economic impacts in the same manner as other Department offices and bureaus (DOI, 2011).

[1]In contrast, the U.S. Bureau of Economic Analysis (BEA) provides benchmark input-output data for the United States. The benchmark accounts show how industries interact at the detailed level; specifically, they show how more than 500 industrial sectors provide input to, and use output from, each other to produce gross domestic product (GDP). These accounts provide detailed information on the flows of the goods and services that make up the production processes of industries. See http://www.bea.gov.

Table 1-1. Economic Characteristics by Insular Area

	Estimated Population (# in 2010)	Estimated Employment (#)	Estimated Employee Compensation ($'000, 2010$)	GDP ($'000, 2010$)	GDP per Capita (2010$)
American Samoa	55,519	15,434	181,812	714,531	10,193
Guam	159,358	68,363	1,596,381	4,564,665	25,659
Northern Mariana Islands	53,883	27,897	355,350	727,744	14,131
U.S. Virgin Islands	106,405	45,495	1,447,841	4,312,597	36,860
Micronesia	111,064	15,418	65,670	265,148	2,402
Marshall Islands	54,038	10,320	98,887	155,800	2,883
Palau	20,472	11,678	99,615	168,522	8,331
United States	308,745,538				46,504

Note: 2010 population estimates were obtained from the 2010 U.S. Census (2011a) and the World Bank (2011b). Data on estimated 2009 GDP and GDP per capita for the four U.S. territories were collected from BEA (2011) and are presented in real 2010 terms. Data on estimated 2008 population, GDP and GDP per capita were obtained for the three FAS from World Bank (2011a, 2011b). Finally, 2009 GDP per capita for the United States was from the World Bank (2011a, 2011b). RTI constructed estimated employment and employee compensation statistics from the most recent secondary sources available and represent various years. The construction of this data for each insular area is explained in more detail in the full report.

1.1 FY 2011 OIA Payments to Insular Areas

In FY 2011, OIA provided $451 million in assistance, grants, and compacts to the insular areas during the fiscal year. In this report, all assistance, grants, and compacts will be referred to collectively as "payments." The majority of OIA's payments are considered mandatory; 77% of spending is classified as "permanent" (OIA, 2011a). OIA payments fund health care, education, government operations, roads, and other types of social and physical infrastructure. From a budgetary standpoint, payments can be separated into three primary categories:

- *fiscal payments*, which are the return of taxes collected by the U.S. federal government to Guam and the USVI, as required by law
- *Assistance to Territories*, which provides general technical assistance, finances education and health care operations, funds and maintains essential infrastructure, and supports environmental initiatives, including Brown Treesnake Control and the Coral Reef Initiative
- *Compact of Free Association*, which distributes annual payments to FAS, per their treaties with the United States, and provides support to the U.S. western Pacific territories and Hawaii to offset the impact the Compact has on regional social infrastructure

For the purposes of this analysis, RTI received detailed budget information from OIA, which was then used to estimate expenditures in each insular area related to OIA payments (Table 1-2). Although this determination was typically straightforward, in some cases determining where spending would be directed was not possible using readily available information. In these cases, RTI made assumptions based on information from previous fiscal years, which are detailed in Appendix A.

Table 1-2. FY 2011 OIA Payments by Insular Area

	Assistance to Territories ($'000, 2010$)	Compact of Free Association—Current ($'000, 2010$)	Compact of Free Association—Permanent ($'000, 2010$)	Fiscal Payments ($'000, 2010$)	Total OIA Payments ($'000, 2010$)
American Samoa	35,162	—	14	—	35,176
Guam	11,691	—	16,827	45,000	73,518
Northern Mariana Islands	14,362	—	1,930	—	16,292
U.S. Virgin Islands	5,691	—	—	100,000	105,691
Micronesia	2,011	1,577	107,056	—	110,644
Marshall Islands	3,512	2,077	65,969	—	71,558
Palau	1,677	14,000	—	—	15,677
Other[a]	11,090	—	11,229	—	22,319
Total	**85,195**	**17,654**	**203,025**	**145,000**	**450,874**

[a] This other category represents payments being spent outside the seven insular areas, such as Washington, DC; Hawaii; and others.

Sources: RTI estimates based on detailed budget information provided by the Office of Insular Affairs (2011a, 2011b).

1.2 Study Objectives

The objectives of this study were to

- estimate the direct economic impacts of OIA payments and indirect/induced multipliers and impacts relevant for OIA grant and payment categories for each insular area;
- review FY 2011 grants and payments and determine affected economic sectors for the American Samoa Operations Grant, Brown Treesnake Control, Compact of Free Association (permanent and current), Coral Reef Initiative, covenant grants, maintenance assistance fund, return of federal taxes to U.S. Virgin Islands and Guam, technical assistance, and water and wastewater projects;
- model the direct and indirect/induced economic impacts of FY 2011 grants and payments for each insular area and for each payment category; and

- prepare a final report that summarizes assumptions and provides tabular data on economic impacts.

1.3 Overview of Study Methodology

Typically, the economic impacts of government spending on specific regions are estimated using I/O models. These models use multipliers to simulate how employment or income generated in one industry can generate additional jobs, income, and output in other industries and for the region's economy as a whole. These methods also allow a breakout between indirect and induced effects that can be useful for policy analysis.

Because no publicly available I/O models existed for the economies of the seven insular areas, RTI developed multipliers for each of the seven insular areas using economic base analysis (EBA).[2] RTI's selection of EBA was motivated by the importance of offering OIA a methodology for estimating economic impacts that can be updated as needed, either for future fiscal years' payments or as new economic data are made available for the insular areas.

EBA is one of the simplest and most widely used techniques for regional economic analysis because it is supported by both the intuitive insights of urban planners and geographers and the formal theory of modern economics (Klosterman, 1990). The reasoning underlying EBA is that an individual region's economic activity is derived from its "base" or "primary" sectors, which are defined as those sectors whose revenue is received primarily from outside the region—base sectors typically include manufacturing firms, mines, and farms that produce goods for export and activities that are funded by the federal government (Klosterman, 1990). As a result, EBA is best applied to small, relatively specialized regions whose economies rely to a larger extent on exports (Wang and vom Hofe, 2007). Consequently, this methodological approach is well suited to studying the economies of the seven insular areas.

Estimating the economic impact of federal funds on economic aggregates like regional employment is typically accomplished using a simple mathematical representation of a region's economy, such as

$$\Delta Y = s^{*}\Delta X \qquad (1.1)$$

[2]Other researchers have used I/O models for Hawaii to model economic impacts for U.S. insular territories; however, RTI does not recommend this approach because it assumes that the economic structure of the insular area is the same as that for Hawaii (see Pike [2007]). The model is also static and does not adjust for sectoral responses to materially significant shocks. Another alternative, but one that requires extensive data collection, would be the same as that employed in a 2008 analysis performed for the Department of Commerce and American Samoa (see ASDC [2008]). This latter method is resource intensive but may narrow the confidence interval surrounding economic multipliers.

where

ΔY is the change in total employment,

ΔX is the change in base-sector employment (direct impact), and

s is total employment/base-sector employment (the base employment multiplier).

This model represents how an increase in base-sector employment will generate a larger increase in the region's total employment because of the ripple effect as new base-sector employees spend money on locally produced goods and services. This ripple effect is quantified by the "s" term, called the "base employment multiplier," which is typically estimated by taking the ratio of total employment to base-sector employment.

Using this core approach as a starting point for modeling the economy of each insular area, RTI estimated economic impacts for each of the seven insular areas in a short time period using available economic data. First, RTI computed an estimate of direct impacts for each of the 10 grant and payment categories for each of the seven insular areas. This entailed combining these data with existing information on employment and income associated with government spending and other economic activities. Direct impacts are usually computed using ratios of employment or income created per dollar of government funding that have been derived from historical data. Second, to estimate the combined indirect and induced impact, RTI calculated multipliers for employment, income, and other economic aggregates by examining the economic structure and activities of each insular area.

To better illustrate this approach, consider the following *hypothetical* example. Suppose that Guam received $50 million of grants and other payments from OIA in 2010. That same year, the government of Guam received total funding of $491 million and employed approximately 11,727 workers (Guam Bureau of Statistics and Plans [GBSP], 2011). Assuming the ratio of government revenue per employee remains constant ($491 million/11,727 = $41,870 per employee), we estimate that the $50 million of funding would have supported approximately 1,194 jobs on the island ($50 million/$41,870 = 1,194). These jobs would be considered the direct employment impact of OIA grants and payments.

To estimate how this direct employment impact would influence Guam's total employment, RTI calculated base multipliers using available data on employment by industry, such as those reported in Table 1-3. Base employment multipliers are calculated by taking the ratio of total employment to employment in base sectors. Base-sector employment is ideally measured through surveys or the use of location quotients. However, in instances where data are

Table 1-3. Guam Employment by Industry (2010)

Industry	2010 Average Employment
Agriculture	323
Construction	6,877
Manufacturing	1,723
Transportation	4,557
Trade	13,623
Finance, insurance, and real estate	2,603
Accommodations	7,617
Other services	9,073
Government of Guam	11,727
Federal government—Military	6,400
Federal government—Nonmilitary	3,840
Total Employment, All industries	**68,363**

Note: Average nonmilitary employment was calculated by taking the average of Guam 2010 employment estimates for March, June, September, and December as reported in Table 15-10 of the 2010 Guam *Statistical Yearbook*. These data include full-time and part-time employees who worked during or received pay for any part of the pay period that included the 12th day of the survey months. Proprietors, self-employed unpaid family workers, and domestic servants are excluded from these estimates. An estimate of active military personnel is included as reported in Table 8-03 of the 2010 Guam *Statistical Yearbook*. However, one should note that military employment is likely to increase drastically in coming years because of the anticipated military scale-up on the island.

Source: GBSP, 2011.

limited, it is acceptable to assume that the entire workforce in those sectors that tend to derive much of their revenue from outside the region can be considered base-sector employment.

In this example, we used the standard assumption that base employment can be estimated as the sum of employment in the agriculture, manufacturing, and federal government sectors (12,287 employees). As a result, the base employment multiplier is estimated to be 5.6 (68,363/12,287 = 5.6). This means that for every one new job supported in the base sector, 4.6 jobs are created elsewhere in the economy. Therefore, the payments support 1,194 jobs directly and support 5,492 additional jobs indirectly elsewhere in the economy as a result of the multiplier process (1,194 *4.6 = 5,492) for a total of 6,686 jobs in the region.

Although this hypothetical example is appropriate for illustrative purposes, this study improved on this simple analytical construction in several ways. First, in the example, economic impacts are estimated using only a single output-to-employee ratio. However, to obtain more accurate measures of the direct employment impact of OIA payments, one must obtain an

understanding of who receives these payments and what they are being spent on. For example, OIA payments used to fund a construction project will have different employment impacts than OIA payments used to fund education. Therefore, the first question asked when creating a more refined analysis is how OIA payments should be classified or treated as direct impacts. For the purposes of this study, OIA payments can be classified in six different ways:

- Education: payments associated with training or education inside the relevant insular area.
- Construction: payments associated with building new or maintaining existing structures.
- Government: payments associated with general government operations or general technical assistance.
- Health care: payments associated with providing medical and other health care services.
- Private: this classification is used only for payments to the Prior Service Benefits program. Beneficiaries receive this money in appreciation for their service during World War II, and it generates an economic impact when recipients spend it on goods and services. Because data are not available on the spending behavior of these beneficiaries, precise output and employee compensation per worker ratios were difficult to obtain. Therefore, RTI typically used ratios that represented averages for the private nonagricultural sector and assumed 100% of beneficiary funds were spent locally.
- Wholesale: payments associated with purchasing goods or equipment from local wholesalers (companies involved in the resale, sale without transformation, of new and used goods to retailers; to industrial, commercial, institutional or professional users; or to other wholesalers). This treatment assumes that the goods or equipment themselves were not manufactured in the insular area.

In addition to improving our classification of OIA payments, this study sought to refine economic impact estimates in a second way. In the example above, only the standard industries (agriculture, mining, manufacturing, and federal government) were assumed to be part of the economic base. However, many insular areas attract a number of tourists, which also contributes to the economic base. Similarly, government operations that are funded from external sources should also be included in measures of economic base employment and employee compensation.

In the analysis described in this report, RTI incorporated both refinements into its economic impact assessment approach to provide OIA with the most accurate estimates possible, given existing data restrictions. RTI also used IMPLAN to model the economic impact of OIA activities in Hawaii and the District of Columbia, areas in which OIA has operations.

1.4 Methodological Limitations

Although EBA has several significant advantages that make it the most reasonable methodological approach for this study, several limitations are associated with it that one must keep in mind when interpreting analysis results.

First, the quality of economic base multipliers relies heavily on the quality of data being used. Most developing areas have a substantial informal sector composed of subsistence agriculture and fishing, domestic aids, street vendors, producers of clothing and handicrafts, and other workers whose occupation and income often go unreported.

Although accurate data on the size and makeup of the informal sector are difficult to gather, the informal sector in developing island areas was assumed to make up a significant percentage of official employment and income statistics. In a study of 110 countries, Schneider (2002) found that the informal sector made up 41% of official gross national income in developing countries and 38% in transition countries. Lal and Raj (2006) compiled data on the informal sector in developing island nations (data on the insular areas were not included) and found that self-employment as a percentage of total nonagricultural employment averaged 35% for the six islands for which these data were available. Data on the informal sector in the Pacific Island areas may be particularly difficult to obtain because, as a result of the rural nature of these areas, most informal workers operate from homes rather than working as street vendors, transportation providers, or other typically urban occupations (Duncan and Voigt-Graf, 2008).

Because of the size of the informal sector in the insular areas, much of the data used in this analysis likely underestimate employment, labor income, and GDP. Subsistence agriculture often makes up a substantial portion of unreported employment. A 1996 survey in Palau estimated the value of the primarily agricultural informal sector at $5 million, or twice the size of the recorded agricultural sector in that year. Most of these goods, however, are consumed by the household and traded informally and do not reach the market (FAO, 2006).

Second, the division between base and nonbase sectors is often unclear. In this analysis, RTI used standard assumptions for identifying which sectors are considered base and nonbase. However, companies within these sectors are often engaged in satisfying both local and external demand. For example, local manufacturers may produce products that are exported and also consumed by local residents. This concern can often be minimized by using techniques for better estimating the portions of each sector that are truly base and nonbase (for example, surveys can be used to collect this information directly from local businesses); however, given the time and data constraints, these techniques were not feasible for this analysis.

Lastly, EBA focuses exclusively on external demand. Therefore, supply constraints are assumed to not be binding, and nondemand factors that may contribute to regional growth are ignored (such as capital accumulation or productivity improvements). Because supply-side considerations are typically most important for long-term growth, EBA is best suited for short-term analyses.

1.5 Data Limitations

When possible, RTI tried to incorporate newer economic data into the FY 2011 EBA model in order to update the output per worker and employee compensation per worker ratios, as well as the base multipliers. These data are essential to determining the direct and indirect impacts of OIA payments, and we believed these inclusions would better describe the significance of funding given the changing economies of the insular areas. Incorporating these new data sets did, however, cause some of the data to come from differing years. For example, to achieve updated employee compensation per employee ratios for the U.S. territories, we used newly released data from the 2009 County Business Patterns (released by the U.S. Census in June 2011). However, these data sets lacked information about sales in each sector, and output per employee ratios could not be determined. RTI had to rely on the 2007 Economic Census for these ratios. This approach assumes that employment and compensation has changed over time in the territories, but output per worker has remained constant since 2007. Because most of the insular areas have experienced some economic decline since 2007, using output-per-employee ratios from 2007 may underestimate the impacts of OIA payments, because during periods of decline and recovery output per worker tends to increase (BEA, 2011; BLS, 1986). The data from the Census also often exclude information about agricultural and public-sector employment, which leads to even more agglomeration of sources and assumptions to complete the employment statistics.

For the FAS, economic data rely on studies that are funded by the OIA through the PITI-VITI educational program. Although RTI was able to update employment data and employment compensation per employee ratios for each of these areas, data on output were unavailable. Therefore, we had to assume that the output per worker for these three areas was comparable to that of American Samoa. American Samoa was chosen as the best U.S. territory comparison because it was most similar to the FAS in terms of GDP per capita and other economic measures. This assumption is also likely an overestimate of the FAS's true output per employee ratio because American Samoa has a higher GDP per capita. The use of American Samoa data as a proxy will likely underestimate the impacts of OIA spending because more jobs will be supported by each dollar of OIA spending.

1.6 Report Organization

A separate report section detailing the payments, economic multipliers, and economic impacts was prepared for each insular area (Sections 2 through 8). In addition, a section for Hawaii and the District of Columbia was prepared (Section 9), because OIA locates significant operations in these regions. Section 10 presents summary economic impact data for all FY 2011 payments.

SECTION 2
AMERICAN SAMOA

2.1 FY 2011 OIA Payments Summary

American Samoa faces a number of obstacles to economic development, including limited land and resources, a small population, limited local technical expertise, a narrow economic base, and vulnerability to natural disasters. The American Samoa economy is highly dependent on the tuna cannery industry, which accounts for the majority of its exports. In 2009 one of two major tuna canneries closed because of foreign competition, and this closure has caused economic decline and unemployment. The real GDP of American Samoa decreased by 4.7% in 2009 (BEA, 2011). The average GDP per capita for American Samoa in 2009 was $10,193 compared with approximately $46,504 in the United States (BEA, 2011; World Bank, 2011a).

OIA strives to foster economic development, promote sound management, and improve quality of life in American Samoa. OIA payments to American Samoa in FY 2011 totaled $35.2 million and were primarily directed toward the government and health care sectors with additional support for education and construction (Table 2-1). According to the OIA's 2010 Congressional District Report, $33.5 million in payments were specifically directed to American Samoa in FY 2011 (OIA, 2011a). The remaining $1.7 million came from other OIA payments that are spent across the insular areas (see Appendix A).

The largest block of OIA payments came in the form of Assistance to Territories funding, the largest proportion of which is operations grants that total nearly $23 million. These operation grants are used to fund basic Samoan government operations and to support the American Samoa High Court (the highest court in American Samoa excluding the U.S. Supreme Court) and the operation of the LBJ Hospital. The American Samoa Operations Grants made up approximately 16% of American Samoa's general fund and 25% of LBJ Hospital's revenue for FY2011 (OIA, 2011b).

Other Assistance to Territories funding, totaling $12.4 million, was used to fund economic development programs, judicial training, and other initiatives such as the Coral Reef Initiative, which pursues the sustainable maintenance and protection of coral reefs through initiatives such as education and outreach programs and the establishment of protection areas, and the Pacific & Virgin Islands Training Initiatives (PITI-VITI). PITI-VITI was established to assist island governments in developing superior leadership, financial stability, accountability, program effectiveness, and economic growth.

Table 2-1. American Samoa: OIA Payments (FY 2011)

Appropriation	Spending ($'000, 2010$)	Impact Treatment
Compact of Free Association		
Compact impact	14	Health care
Total, Compact of Free Association	*14*	
Assistance to Territories		
American Samoa operations grant—Basic operations	14,240	Government
American Samoa operations grant—LBJ hospital operations	7,657	Health care
American Samoa operations grant—High court	855	Government
Subtotal, American Samoa Operations Grants	*22,752*	
General technical assistance—Direct grants	1,080	Government
General technical assistance—Judicial training	46	Government
General technical assistance—USDA Graduate School PITI-VITI	213	Education
General technical assistance—Close Up Foundation	150	Education
Subtotal, General Technical Assistance	*1,489*	
Coral Reef Initiative	75	Government
Maintenance assistance	200	Government
Northern Mariana Covenant Grants—American Samoa construction	10,500	Construction
Office of Insular Affairs	146	Government
Subtotal, Other Assistance to Territories	*10,921*	
Total, Assistance to Territories	*35,162*	
Total Spending Inside American Samoa	**35,176**	

Source: RTI estimates based on OIA (2011b).

In addition to funding received from OIA's Assistance to Territories, American Samoa also received $14 million through the Compact of Free Association Compact Impact Grant, which offsets costs incurred by American Samoan health, educational, and social systems from in-migration of FAS residents.

2.2 Direct Economic Impacts of OIA Payments

Direct economic impacts of OIA payments were assigned to four economic sectors—education, construction, government, and health care. To calculate the employment and

employee compensation impacts associated with this spending, as described in the methodology, we used the following "output" and employee compensation-to-employee ratios:[1]

- **Education:** Based on sales and employment data from the 2007 Economic Census for American Samoa, the average output per worker ratio in the education sector (NAICS 61) was $44,907 per employee (Census, 2009). Adjusting this ratio to 2010 dollars gives an output-to-employee ratio of **$47,227**. Based on payroll and employment data from the Census 2009 County Business Patterns for American Samoa, the average employee compensation-to-employee ratio in the education sector was $13,822 per employee. Adjusting this ratio to 2010 dollars gives an employee compensation-to-employee ratio of **$14,049** (Census, 2011b).
- **Construction:** Based on sales and employment data from the 2007 Economic Census for American Samoa, the average output per worker ratio in the construction sector (NAICS 23) was $52,431 per employee (Census, 2009). Adjusting this ratio to 2010 dollars gives an output-to-employee ratio of **$55,140**. Based on payroll and employment data from the Census 2009 County Business Patterns for American Samoa, the average employee compensation-to-employee ratio in the construction sector was $12,238 per employee (Census, 2011b). Adjusting this ratio to 2010 dollars gives an employee compensation-to-employee ratio of **$12,438**.
- **Government:** According to American Samoa's Basic Financial Statements (American Samoa Treasury Department [ASTD], 2008), the government of American Samoa received approximately $202 million in revenue and employed 6,035 individuals in 2008. Adjusting for inflation, this implies an output-to-employee ratio of **$33,821**. Because data on government employee compensation were unavailable, the average payroll per worker ratio for nonagricultural private-sector workers ($12,031) from the 2009 County Business Patterns was used as a proxy (Census, 2011b). Adjusting for inflation, this implies an employee compensation-to-employee ratio of **$12,228**.
- **Health care:** Based on sales and employment data from the 2007 Economic Census for American Samoa, the average output per worker ratio in the health care sector (NAICS 62) was $37,445 per employee (Census, 2009). Adjusting this ratio to 2010 dollars gives an output-to-employee ratio of **$39,380**. Based on payroll and employment data from the Census 2009 County Business Patterns for American Samoa, the average employee compensation-to-employee ratio in the health care sector was $10,976 per employee (Census, 2011b). Adjusting this ratio to 2010 dollars gives an employee compensation-to-employee ratio of **$11,156**.

Dividing the payments directed toward each sector by the employment and employee compensation ratios yields the direct employment and employee compensation impacts reported in Table 2-2.

[1]All adjustments for inflation were made using the U.S. Consumer Price Index for All Urban Consumers (Bureau of Labor Statistics, 2011).

Table 2-2. American Samoa: Estimated Direct Economic Impacts (FY 2011)

Industry	FY 2010 Payments ($'000, 2010$)	Output-to-Employee Ratio ($/employee)	Employee Compensation-to-Employee Ratio ($/employee)	Direct Employment Impact (#)	Direct Employee Compensation Impact ($'000, 2010$)
Education	363	47,227	14,049	8	108
Construction	10,500	55,140	12,438	190	2,369
Government	16,642	33,821	12,228	492	6,017
Health care	7,671	39,380	11,156	195	2,173
Total	**35,176**			**885**	**10,667**

Sources: RTI estimates based on Census (2009, 2011b), ASTD (2008), and OIA (2011b). All data were adjusted to 2010 dollars using the consumer price index (BLS, 2011).

2.3 Indirect and Induced Economic Impacts (Base Multipliers)

The employment and employee compensation multipliers were developed using the best available employment and employee compensation data for American Samoa (Table 2-3). Table 2-3 was developed from a combination of data sources. First, total employment for American Samoa as a whole was listed in the 2011 Government Accountability Office (GAO) report as 15,434 total employees for the year 2009. Employment in the tuna cannery industry for 2009 was estimated by applying the average change in employment in the sector from 2001 to 2008, which was obtained from American Samoa's Financial Statement (ASTD, 2008). Next, employment for the remaining industries was distributed assuming that the proportion of total employment associated with each remaining industry was the same as it was in 2002 (2002 employment data by industry were obtained from American Samoa Department of Commerce [ASDC] [2008]). After employment by industry was estimated, total employee compensation in each industry was estimated by applying employee compensation-per-worker ratios for each industry that were obtained from the 2009 County Business Patterns and 2007 Agricultural Census to the employment totals (Census, 2011b; USDA, 2011). Because employee compensation data for government employees were not available from either of these sources, government employees were assumed to earn the same employee compensation per worker as the average for the nonagricultural private sector.

The economic base of American Samoa is agriculture, fishing, mining, manufacturing, and federal government activities. Industries supported by tourism can also be considered part of the economic base. Ideally, data would be available on measures of the number of employees who are supported by tourism. However, because these data were unavailable, we assumed that

Table 2-3. American Samoa: Employment and Employee Compensation by Industry (2009)

Industry	Employment (#)	Employee Compensation ($'000, 2010$)
Economic Base Industries		
Agriculture, fishing, and mining	450	289
Government—American Samoa government[a]	3,627	44,347
Government—Federal government	137	1,673
Manufacturing—Fish processing	4,815	53,717
Manufacturing—Other	49	541
Tourism—Accommodation	38	406
Tourism—Food services and drinking places	495	5,274
Noneconomic Base Industries		
Construction	518	6,443
Educational and health care services	663	8,113
Financial activities	283	3,160
Information	255	5,280
Other services	304	3,718
Professional and business services	780	8,697
Retail trade	1,606	20,706
Transportation and warehousing	681	9,041
Utilities	430	5,253
Wholesale trade	305	5,154
Total	**15,434**	**181,812**

[a] Because only 50% of American Samoa's budget comes from external sources, we assumed that only 50% of the employment and employee compensation associated with the territorial government was part of the base sector. The remaining employees and employee compensation were assumed to be part of the nonbase sector.

Sources: RTI estimates based on Census (2011b), USDA (2011), GAO (2011), and ASDC (2008). All data were adjusted to 2010 dollars using the consumer price index (BLS, 2011).

the entire accommodation and food services industries are supported by tourism and, therefore, are part of the economic base.[2] This is likely a conservative approach because, to the extent that this approximation overrepresents the portion of the economy supported by tourism, employment and employee compensation multipliers will be reduced.

[2] A similar approach for creating a proxy for measuring the role of tourism in insular area economies was used in GAO (2006).

In addition to these industries, a portion of American Samoa's territorial government is considered part of the economic base. Because an average of approximately 50% of American Samoa's budget comes from external sources, this analysis assumes 50% of territorial government employment is considered base employment (GAO, 2006).[3] Based on these assumptions and the data in Table 2-3, we calculated the following multipliers:

- **Base employment multiplier:** Base employment was calculated to include 7,797 employees out of a total of 15,434. Dividing total employment by base employment yields a multiplier of **1.98**, meaning that for every base employment position supported by OIA funding, an estimated 0.98 additional jobs are formed elsewhere in the economy. This estimate matches the 2005 economic base multiplier that was estimated for American Samoa in the 2008 OIA study on the prospective economic impact of the decline of the Samoa cannery industry (ASDC, 2008).
- **Employee compensation multiplier:** Employee compensation associated with base employment was estimated to be $84 million. Dividing total employee compensation by base employee compensation yields a base multiplier of **2.16**, meaning that every dollar of employee compensation supported by the 2011 spending will create an additional $1.16 in employee compensation.

Multiplying the direct employment impact and employee compensation impacts in Table 2-2 by these multipliers yields a total employment impact of 1,752 employees and a total employee compensation impact of $23.1 million.

2.4 Summary Economic Impact Estimate for FY 2011

In summary, the $35.2 million of OIA payments directly support 885 jobs and $10.7 million in employee compensation. Accounting for the multiplier process, we estimate that OIA spending supports a total 1,752 jobs and $23.1 million in employee compensation.

Because precise GDP multipliers could not be computed because of data unavailability, the impact of OIA payments on GDP was estimated by multiplying the number of jobs supported through OIA by the ratio of GDP to total employees. It is estimated that American Samoa's GDP was $703 million in 2009, or $714.5 million in 2010 dollars (BEA, 2011). Dividing this by the total number of employees estimated to be working in American Samoa in 2009 (15,434) implies a GDP-to-employee ratio of $46,296. Multiplying this ratio by the direct and total employment impacts calculated above, *we estimate that OIA spending supports direct GDP impacts of $41 million and total impacts of $81 million.* A summary of economic impact measures is presented in Table 2-4.

[3]In addition to payments from the OIA and the Department of the Interior, the government of American Samoa also receives support from various other federal government agencies, including the Department of Education, the Department of Agriculture, and the Department of Health and Human Services.

Table 2-4. American Samoa: Total Estimated Economic Impact (FY 2011)

	Direct Economic Impact	Indirect/Induced Economic Impact	Total Economic Impact
Employment (#)	885	867	1,752
Employee compensation ($'000, 2010$)	10,667	12,400	23,067
GDP ($'000, 2010$)	40,970	40,132	81,103

Sources: RTI estimates based on Census (2009, 2011b), OIA (2011b), GAO (2011), USDA (2011), and BEA (2011). All data were adjusted to 2010 dollars using the consumer price index (BLS, 2011).

The significance of OIA's economic contributions can be better understood when viewed in relation to the American Samoa economy as a whole, which is summarized in Table 2-5. As this table illustrates, the 1,752 jobs directly and indirectly supported by OIA payments represent 11% of American Samoa's estimated total employment. Similarly, $23.1 million of employee compensation associated with these employees accounts for approximately 13% of total employee compensation inside the region, and the $81.1 million of GDP associated with these employees represents 11% of total GDP produced by the region.

Table 2-5. American Samoa: Estimated Impact Relative to National Economy (FY 2011)

	Total Economic Impact for FY 2011 OIA Payments	National Data	Impact as Percentage of Total Economy
Employment (#)	1,752	15,434	11%
Employee compensation ($'000, 2010$)	23,067	181,812	13%
GDP ($'000, 2010$)	81,103	714,531	11%

Sources: RTI estimates based on Census (2009, 2011b), OIA (2011b), GAO (2011), USDA (2011), and BEA (2011). All data were adjusted to 2010 dollars using the consumer price index (BLS, 2011).

SECTION 3
GUAM

3.1 FY 2011 OIA Payments Summary

Although Guam is among the wealthiest of the insular areas, it continues to face challenges in implementing effective government, health care, and education systems. Guam's economy is largely based on tourism from Asia and is, therefore, sensitive to regional consumer spending trends. The U.S. military buildup, which may increase Guam's population by an estimated 45%, creates uncertainty for Guam, which could see an increase in employment but also strains on its infrastructure (*Washington Post*, 2010). In 2008 and 2009, Guam was the only U.S. territory to experience real GDP growth (BEA 2011). The average GDP per capita for Guam in 2009 was $25,659 (2010$), slightly over half the U.S. GDP per capita in the same year ($46,504) (BEA, 2011; World Bank, 2011a).

OIA payments to Guam in FY 2011 totaled $73.5 million and were primarily directed to the government sector with additional support for health care, education, and construction. A detailed breakdown of OIA payments is presented in Table 3-1. According to the OIA's 2010 Congressional District Report, $68.9 million in payments was specifically directed to Guam in FY 2011 (OIA, 2011a). The remaining $4.6 million came from other OIA payments that are spent across the insular areas (see Appendix A).The largest block of OIA payments, totaling $45 million, came in the form of fiscal payments associated with Section 30 Income Taxes. These are funds transferred by OIA from the U.S. Treasury to Guam and largely consist of federal income taxes paid by military personnel stationed on Guam, immigration fees, and miscellaneous duties (Limtiaco, 2008). OIA also provided nearly $17 million through the Compact of Free Association, which Guam intends to use for a variety of equipment purchases and infrastructure.

Assistance to Territories payments, which totaled about $11.7 million, provide for direct grants, economic development, and judicial training and the PITI-VITI. Other technical assistance programs, which made up about $10 million of the Assistance to Territories payments, include infrastructure maintenance assistance, funding for Guam Construction, Brown Treesnake Control, and the Close Up Foundation. The Brown Treesnake Control program is intended to fund research and implementation techniques to eradicate this invasive species. The Close Up Foundation is a civic education program designed to teach democracy and citizenship and improve civic education in the insular areas. OIA also distributed funds for the Coral Reef Initiative, which supports the sustainable maintenance and protection of coral reefs through initiatives such as education and outreach programs and the establishment of protection areas.

Table 3-1. Guam: OIA Payments by Appropriation (FY 2011)

Appropriation	Spending ($'000, 2010$)	Impact Treatment
Fiscal Payments		
Guam Section 30 income taxes	45,000	Government
Total, Fiscal Payments	*45,000*	
Compact of Free Association		
DPW schools leaseback	7,100	Education
GMHA medical equipment and supplies	2,500	Wholesale
Judiciary of Guam case management system	3,777	Government
University of Guam infrastructure improvements	1,400	Construction
DOC electronic cell locking system upgrade	300	Wholesale
DPH&SS pharmaceutical and medical supplies	750	Wholesale
DOC equipment (standby generators)	500	Wholesale
DISID permanent injunction projects	250	Government
DYA facilities improvements	250	Construction
Total, Compact of Free Association	*16,827*	
Assistance to Territories		
General technical assistance—Direct grants	1,267	Government
General technical assistance—Judicial training	46	Government
General technical assistance—USDA Graduate School PITI-VITI	213	Education
General technical assistance—Close Up Foundation	150	Education
Subtotal, General Technical Assistance	*1,675*	
Brown Treesnake Control	2,345	Government
Guam infrastructure	2,000	Construction
Maintenance assistance	320	Government
Coral Reef Initiative	$75	Government
Northern Mariana Covenant Grants—Guam construction	5,026	Construction
Wastewater projects	250	Construction
Subtotal, Other	*10,016*	
Total, Assistance to Territories	*11,691*	
Total Spending Inside Guam	**73,518**	

Source: RTI estimates based on OIA (2011b).

3.2 Direct Economic Impacts of OIA Payments

Direct economic impacts of OIA payments were assigned to four economic sectors—education, construction, government, and wholesale. To calculate the employment and employee compensation impacts associated with this spending, as described in the methodology, we used the following output and employee compensation-to-employee ratios:[1]

- **Education:** Based on sales and employment data from the 2007 Economic Census for Guam, the average output per worker ratio in the education sector (NAICS 61) was $38,853 per employee (Census, 2009). Adjusting this ratio to 2010 dollars gives an output-to-employee ratio of **$40,861**. Based on payroll and employment data from the Census 2009 County Business Patterns for Guam, the average employee compensation-to-employee ratio in the education sector was $20,113 per employee. Adjusting this ratio to 2010 dollars gives an employee compensation-to-employee ratio of **$20,443** (Census, 2011b).
- **Construction:** Based on sales and employment data from the 2007 Economic Census for Guam, the average output per worker ratio in the construction sector (NAICS 23) was $96,302 per employee (Census, 2009). Adjusting this ratio to 2010 dollars gives an output-to-employee ratio of **$101,278**. Based on payroll and employment data from the Census 2009 County Business Patterns for Guam, the average employee compensation-to-employee ratio in the construction sector was $21,654 per employee (Census, 2011b). Adjusting this ratio to 2010 dollars gives an employee compensation-to-employee ratio of **$22,010**.
- **Government:** According to the 2010 Guam Statistical Yearbook, the government of Guam received approximately $491 million in revenue and employed approximately 11,727 individuals in 2010 (GBSP, 2011). This implies an output-to-employee ratio of **$41,870**. Because data on government employee compensation were unavailable, the average employee compensation-per-worker ratio for nonagricultural private-sector workers ($23,583) from the 2009 County Business Patterns was used as a proxy (Census, 2011b). Adjusting for inflation, this implies an employee compensation-to-employee ratio of **$23,970**.
- **Wholesale:** Based on sales and employment data from the 2007 Economic Census, the average output per worker ratio in the wholesale sector (NAICS 42) was $334,104 per employee (Census, 2009). Adjusting this ratio to 2010 dollars gives an output-to-employee ratio of **$351,368**. Based on payroll and employment data from the Census 2009 County Business Patterns for Guam, the average employee compensation-to-employee ratio in the wholesale sector was $28,017 per employee (Census, 2011b). Adjusting this ratio to 2010 dollars gives an employee compensation-to-employee ratio of **$28,476**.

[1] All adjustments for inflation were made using the U.S. Consumer Price Index for All Urban Consumers (BLS, 2011).

Dividing the payments directed toward each sector by the employment and employee compensation ratios yields the direct employment and employee compensation impacts reported in Table 3-2.

Table 3-2. Guam: Estimated Direct Economic Impacts (FY 2011)

Industry	FY 2011 Payments ($'000, 2010$)	Output-to-Employee Ratio ($/employee)	Employee Compensation-to-Employee Ratio ($/employee)	Direct Employment Impact (#)	Direct Employee Compensation Impact ($'000, 2010$)
Education	7,463	40,861	20,443	183	3,733
Construction	8,926	101,278	22,010	88	1,940
Government	53,079	41,870	23,970	1,268	30,387
Wholesale	4,050	351,368	28,476	12	328
Total	**73,518**			**1,550**	**36,388**

Sources: RTI estimates based on Census (2009, 2011b), OIA (2011b), and GBSP (2011). All data were adjusted to 2010 dollars using the consumer price index (BLS, 2011).

3.3 Indirect and Induced Economic Impacts (Base Multipliers)

The employment and employee compensation multipliers were developed using the best available employment and employee compensation data presented in Table 3-3. This table was developed from a combination of data sources. First, 2010 data on employment by industry were obtained from the 2010 Guam Statistical Yearbook. Next, employee compensation for each industry was estimated by applying the annual payroll to employee ratios found in the 2009 County Business Patterns and from the 2007 Agricultural Census (adjusted for inflation) to the employment totals (Census, 2011b; USDA, 2009a). For the government and military sectors, the average payroll-per-worker ratio for nonagricultural private-sector workers was used as a proxy.

The economic base of Guam is agriculture, manufacturing, and federal government activities. Industries supported by tourism can also be considered part of the economic base. Ideally, data would be available on the number of employees supported by tourism. However, because these data were unavailable, we assumed that the entire accommodation and food services industries are supported by tourism and are, therefore, part of the economic base.[2] This is likely a conservative approach because, to the extent that this approximation overrepresents the portion of the economy supported by tourism, employment and employee compensation multipliers will be reduced.

[2]A similar approach for creating a proxy for measuring the role of tourism in insular area economies was used in GAO (2006).

Table 3-3. Guam: Estimated Employment and Employee Compensation by Industry (2010)

Industry	Employment (#)	Employee Compensation ($'000, 2010$)
Economic Base Industries		
Agriculture	323	507
Government—Government of Guam[a]	11,727	281,088
Government—Federal government (military)	6,400	153,408
Government—Federal government (nonmilitary)	3,840	92,045
Manufacturing	1,723	53,330
Tourism—Accommodation and food services	7,617	114,346
Noneconomic Base Industries		
Construction	6,877	151,352
Finance, insurance, and real estate	2,603	81,075
Other services	9,073	194,276
Trade	13,623	306,879
Transportation	4,557	168,075
Total	**68,363**	**1,596,381**

[a] Note that because only 14% of Guam's budget comes from external sources, it was assumed that only 14% of the employment and employee compensation associated with the territorial government was part of the base sector. The remaining employees and employee compensation were assumed to be part of the nonbase sector.

Sources: RTI estimates based on GBSP (2011) and Census (2011b). All data were adjusted to 2010 dollars using the consumer price index (BLS, 2011).

In addition to these industries, a portion of Guam's territorial government is considered part of the economic base. Because 14% of Guam's government revenue comes from external sources, 14% of territorial government employment was included in the base employment for the purpose of calculating base multipliers (GBSP, 2009).[3] Based on these assumptions and the data in Table 3-3, the following multipliers were calculated:

- **Base employment multiplier:** Base employment was calculated to include 21,545 employees out of a total of 68,363. Dividing total employment by base employment yields a multiplier of **3.17**, meaning that for every base employment position supported by OIA funding, an estimated 2.17 additional jobs are formed elsewhere in the economy.
- **Employee compensation multiplier:** Employee compensation associated with base employment was estimated to be $453 million. Dividing total employee

[3]In addition to payments from the OIA and the Department of the Interior, the government of Guam also receives support from various other federal government agencies, including the Department of Education, Department of Health and Human Services, and Department of Homeland Security (GAO, 2006).

compensation by base employee compensation yields a base multiplier of **3.52**, meaning that every dollar of employee compensation supported by the 2011 spending will create an additional $2.52 in employee compensation elsewhere in the economy.

Multiplying the direct employment impact and employee compensation impacts in Table 3-2 by these multipliers yields a total employment impact of 4,918 employees and a total employee compensation impact of $128 million.

3.4 Summary Economic Impact Estimate for FY 2011

In summary, the $73.5 million of OIA payments directly supports 1,550 jobs and $36.4 million in employee compensation. Accounting for the multiplier process, we estimate that OIA spending supports a total of 4,918 jobs and $128 million in employee compensation.

Because exact GDP multipliers could not be computed because of data unavailability, the impact of OIA payments on GDP was approximated by multiplying the number of jobs supported through OIA by the ratio of GDP to total employees. GDP for Guam was estimated to be $4,491 million in 2009, or $4,565 million in 2010 dollars (BEA, 2011). Dividing this estimate by the total number of employees reported earlier yields a GDP-to-employee ratio of $66,771 per worker. Multiplying this ratio by the direct and total employment impacts calculated above, *we estimate that OIA spending supports direct GDP impacts of $103.5 million and total impacts of $328.4 million.* A summary of economic impact measures is presented in Table 3-4.

Table 3-4. Guam: Total Estimated Economic Impact (FY 2011)

	Direct Economic Impact	Indirect/Induced Economic Impact	Total Economic Impact
Employment (#)	1,550	3,368	4,918
Employee compensation ($'000, 2010$)	36,388	91,848	128,237
GDP ($'000, 2010$)	103,494	224,897	328,392

Sources: RTI estimates based on Census (2011b), GBSP (2011), OIA (2011b), and BEA (2011). All data were adjusted to 2010 dollars using the consumer price index (BLS, 2011).

The significance of OIA's economic contributions can be better understood when viewed in relation to the Guam economy as a whole, which is summarized in Table 3-5. As this table illustrates, the 4,918 jobs directly and indirectly supported by OIA payments represent 7% of Guam's total employment in 2010. Similarly, $128.2 million of employee compensation associated with these employees accounts for approximately 8% of total employee compensation inside the region, and the $328.4 million of GDP associated with these employees represents 7% of total GDP produced by the region.

Table 3-5. Guam: Estimated Impacts Relative to National Economy (FY 2011)

	Total Economic Impact for FY 2011 OIA Payments	National Data	Impact as Percentage of Total Economy
Employment (#)	4,918	68,363	7%
Employee compensation ($'000, 2010$)	128,237	1,596,381	8%
GDP ($'000, 2010$)	328,392	4,564,665	7%

Sources: RTI estimates based on Census (2011b), GBSP (2011), OIA (2011b), and BEA (2011). All data were adjusted to 2010 dollars using the consumer price index (BLS, 2011).

SECTION 4
COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS (CNMI)

4.1 FY 2011 OIA Payments Summary

In 2009, the average GDP per capita for CNMI was approximately $14,131 (2010$), close to 30% of the U.S. GDP per capita, $46,504 (2010$), in the same year (BEA, 2011; World Bank, 2011a). However, this country continues to face economic development and infrastructural challenges. Once home to a billion-dollar garment industry, CNMI lost all garment factories because of foreign competition; as a result, real GDP dropped by 19.8% in 2009 (BEA, 2011).

OIA payments to CNMI in 2011 totaled $16.3 million and were primarily directed to the construction and government sectors with additional support for education and the private sector (Table 4-1). According to the OIA's 2010 Congressional District Report, $12.4 million in payments were specifically directed to CNMI in FY 2011 (OIA, 2011a). The remaining $3.9 million came from other OIA payments that are spent across the insular areas (see Appendix A).

Assistance to Territories payments, totaling about $14.4 million, made up the majority of funding to CNMI. General technical assistance, which made up $2.7 million of all Assistance to Territories, provided for direct grants, judicial training, and PITI-VITI. Also included in general technical assistance were the Close Up Foundation, the CNMI Ombudsman's Office, CNMI Immigration, Labor and Law Enforcement General, and the Prior Service Benefits Program, which issues benefits to CNMI citizens who worked for the U.S. Navy or the U.S. Trust Territory of the Pacific Islands from 1944 through 1968. The funding for immigration and law enforcement has increased over the years because CNMI must now adopt and implement the same immigration policies of the United States (OIA, 2011b). The remainder of the Assistance to Territories funding went to other activities such as the Coral Reef Initiative, wastewater improvements, and Brown Treesnake Control. CNMI used wastewater funding for 2010 to improve compliance with the Clean Water Act and the Safe Drinking Water Act.

OIA also provided nearly $2 million through the Compact of Free Association, which CNMI intends to use for a variety of government purposes, including funding for the Department of Public Health and Division of Youth Services.

4.2 Direct Economic Impacts of OIA Payments

Direct economic impacts of OIA payments were assigned to four economic sectors—education, construction, government, and the general private sector. To calculate the

Table 4-1. CNMI: OIA Payments (FY 2011)

Appropriation	Spending ($'000, 2010$)	Impact Treatment
Compact of Free Association		
Department of Public Health	537	Government
Division of Youth Services	45	Government
Department of Public Safety	1,157	Government
Department of Corrections	155	Government
Office of Public Defender	37	Government
Total, Compact of Free Association	*1,930*	
Assistance to Territories		
General technical assistance—Direct grants	813	Government
General technical assistance—Judicial training	46	Government
General technical assistance—USDA Graduate School PITI-VITI	213	Education
General technical assistance—Close Up Foundation	150	Education
General technical assistance—CNMI Ombudsman's Office	250	Government
General technical assistance—CNMI Immigration, Labor and Law Enforcement	1,000	Government
General technical assistance—Prior Service Benefits Program	224	Private
Subtotal, General Technical Assistance	*2,695*	
Brown Treesnake Control	355	Government
Coral Reef Initiative	75	Government
Maintenance assistance	141	Government
Northern Mariana Covenant Grants—CNMI construction	10,000	Construction
Office of Insular Affairs	346	Government
Wastewater projects	750	Government
Subtotal Other	11,667	
Total, Assistance to Territories	14,362	
Total Spending Inside CNMI	**16,292**	

Source: RTI estimates based on OIA (2011b).

employment and employee compensation impacts associated with this spending, as described in the methodology, we used the following output and employee compensation-to-employee ratios:[1]

- **Education**: Based on sales and employment data from the 2007 Economic Census for CNMI, the average output per worker ratio in the education sector (NAICS 61) was $26,228 per employee (Census, 2009). Adjusting this ratio to 2010 dollars gives an output-to-employee ratio of **$27,583**. Based on payroll and employment data from the Census 2009 County Business Patterns for CNMI, the average employee compensation-to-employee ratio in the education sector was $14,956 per employee (Census, 2011b). Adjusting this ratio to 2010 dollars gives an employee compensation-to-employee ratio of **$15,201**.
- **Construction:** Based on sales and employment data from the 2007 Economic Census for CNMI, the average output per worker ratio in the construction sector (NAICS 23) was $59,466 per employee (Census, 2009). Adjusting this ratio to 2010 dollars gives an output-to-employee ratio of $**62,539**. Based on payroll and employment data from the Census 2009 County Business Patterns for CNMI, the average employee compensation-to-employee ratio in the construction sector was $8,145 per employee (Census, 2011b). Adjusting this ratio for inflation, this implies an employee compensation-to-employee ratio of $**8,279**.
- **Government:** According to CNMI's Single Audit Financial Statements, the government of CNMI received approximately $159 million in revenue in 2007 or $167 million in 2010 dollars (CNMI Office of the Public Auditor, 2008). Although 2007 employment data were not available, CNMI's Comprehensive Economic Development Strategic Plan indicates that the public administration employment in 2005 included 5,710 workers (CNMI Department of Commerce, 2009). Assuming employment stayed approximately the same in 2007, this implies a government-to-employee ratio of **$29,285** in 2010 dollars. Because data on government employee compensation were unavailable, the average payroll-per-worker ratio for nonagricultural private-sector workers ($12,898) from the Census 2009 County Business Patterns was used as a proxy (Census, 2011b). Adjusting for inflation, this implies an employee compensation-to-employee ratio of **$13,110**.
- **Private:** Based on sales and payroll data from the 2007 Economic Census, the average output per worker in the nonagricultural private sector was $56,767 per employee (Census, 2009). Adjusting this ratio to 2010 dollars gives an output-to-employee ratio of $**59,701**. Based on payroll and employment data from the Census 2009 County Business Patterns for CNMI, the average employee compensation-to-employee ratio in the nonagricultural private sector was $12,898 per employee (Census, 2011b). Adjusting this ratio for inflation, this implies an employee compensation-to-employee ratio of $**13,110**.

[1]All adjustments for inflation were made using the U.S. Consumer Price Index for All Urban Consumers (BLS, 2011).

Dividing the payments directed toward each sector by the employment and employee compensation ratios yields the direct employment and employee compensation impacts reported in Table 4-2.

Table 4-2. CNMI: Estimated Direct Economic Impacts (FY 2011)

Industry	FY 2011 Payments ($'000, 2010$)	Output-to-Employee Ratio ($/employee)	Employee Compensation-to-Employee Ratio ($/employee)	Direct Employment Impact (#)	Direct Employee Compensation Impact ($'000, 2010$)
Education	363	27,583	15,201	13	200
Construction	10,000	62,539	8,279	160	1,324
Government	5,706	29,285	13,110	195	2,554
Private	224	59,701	13,110	4	49
Total	**16,293**			**372**	**4,127**

Sources: RTI estimates based on Census (2009, 2011b), OIA (2011b), CNMI Office of the Public Auditor (2008), and CNMI Department of Commerce (2009). All data were adjusted to 2010 dollars using the consumer price index (BLS, 2011).

4.3 Indirect and Induced Economic Impacts (Base Multipliers)

The employment and employee compensation multipliers were developed using the employment and employee compensation data presented in Table 4-3. This table was developed from a combination of data sources. First, based on a report from GAO (2011), total employment for 2009 in CNMI was listed as 27,897 according to government tax records. The report also noted that the last garment factory in the territory closed in early 2009; therefore, we assumed the garment industry's employment was zero for the year (GAO, 2011). Next, employment for the remaining industries was distributed assuming that the proportion of total employment associated with each remaining industry was the same as it was in 2005 (2005 employment data by industry were obtained from CNMI Department of Commerce [2009]) After estimating the employment by industry, we estimated total employee compensation in each industry by applying employee compensation-per-worker ratios for each industry that were obtained from the 2009 County Business Patterns (Census, 2011b). To estimate employee compensation information for the public administration industry, we used the average employee compensation-per-worker ratio for nonagricultural, private-sector industries.

The economic base of CNMI is agriculture, fishing, mining, and manufacturing. Industries supported by tourism can also be considered part of the economic base. Ideally, data would be available on the number of employees who are supported by tourism. However,

Table 4-3. CNMI: Estimated Employment and Employee Compensation by Industry (2009)

Industry	Employment (#)	Employee Compensation ($'000, 2010$)
Economic Base Industries		
Resources (agriculture, fishing, mining, extraction, etc.)	722	15,878
Apparel	0	0
Other manufacturing	927	7,575
Tourism—Hotels and lodging	2,986	29,269
Tourism—Food services	1,565	15,342
Government (public administration)[a]	6,875	90,129
Noneconomic Base Industries		
Construction	1,541	12,759
Transportation, communications, and utilities	1,818	25,929
Wholesale and retail trade	3,407	45,423
Finance, insurance and real estate	1,180	21,882
Other services	6,875	91,164
Total	**27,897**	**355,350**

[a] Note that because only 20% of CNMI's budget comes from external sources, it was assumed that only 20% of the employment and employee compensation associated with the territorial government was part of the base sector. The remaining employees and employee compensation were assumed to be part of the nonbase sector.

Sources: RTI estimates based on GAO (2011), Census (2009, 2011b), and CNMI Department of Commerce (2009). All data were adjusted to 2010 dollars using the consumer price index (BLS, 2011).

because these data were unavailable, we assumed that the entire accommodation and food services industries are supported by tourism and are, therefore, part of the economic base.[2] This is likely a highly conservative approach because, to the extent that this approximation overrepresents the portion of the economy supported by tourism, employment and employee compensation multipliers will be reduced.

In addition to these industries, a portion of CNMI's territorial government is considered part of the economic base. Specifically, because 20% of CNMI's government revenue comes from external sources, 20% of territorial government (public administration) employment was

[2] A similar approach for creating a proxy for measuring the role of tourism in insular area economies was used in GAO (2006).

included in the base employment for the purpose of calculating base multipliers (GAO, 2006).[3] Based on these assumptions and the data in Table 4-3, we calculated the following multipliers:

- **Base employment multiplier:** Base employment was calculated to include 7,576 employees out of a total of 27,897. Dividing total employment by base employment yields a multiplier of **3.68**, meaning that for every base employment position supported by OIA funding, an estimated 2.68 additional jobs are formed elsewhere in the economy.
- **Employee compensation multiplier:** Employee compensation associated with base employment was estimated to be $86.1 million. Dividing total employee compensation by base employee compensation yields a base multiplier of **4.13**, meaning that every dollar of employee compensation supported by the 2010 spending will create an additional $3.13 in employee compensation elsewhere in the economy.

Multiplying the direct employment impact and employee compensation impacts in Table 4-2 by these multipliers yields a total employment impact of 1,369 employees and a total employee compensation impact of $17 million.

4.4 Summary Economic Impact Estimate for FY 2011

In summary, the $16.3 million of OIA payments directly support 372 jobs and $4.1 million in employee compensation. Accounting for the multiplier process, we estimate that OIA spending supports a total 1,369 jobs and $17 million in employee compensation.

Because GDP multipliers could not be computed as a result of data unavailability, the impact of OIA payments on GDP was estimated by multiplying the number of jobs supported through OIA by the ratio of GDP to total employees. GDP for CNMI was estimated to be $716 million in 2009, or $728 million in 2010 dollars (BEA, 2011). Dividing this total GDP by the total employment reported above yields a GDP-to-employee ratio of $26,087. Multiplying this ratio by the direct and total employment impacts calculated above, *we estimate that OIA spending supports direct GDP impacts of $9.7 million and total impacts of $35.7 million*. A summary of economic impact measures is presented in Table 4-4.

[3]In addition to payments from the OIA and the Department of the Interior, the government of CNMI also receives support from various other federal government agencies, including the Department of Agriculture, Department of Health and Human Services, and Department of Homeland Security (GAO, 2006).

Table 4-4. CNMI: Total Estimated Economic Impact (FY 2011)

	Direct Economic Impact	Indirect/Induced Economic Impact	Total Economic Impact
Employment (#)	372	997	1,369
Employee compensation ($'000, 2010$)	4,127	12,909	17,036
GDP ($'000, 2010$)	9,695	26,007	35,702

Sources: RTI estimates based on GAO (2011), Census (2009, 2011b), and CNMI Department of Commerce (2009). All data were adjusted to 2010 dollars using the consumer price index (BLS, 2011).

The significance of OIA's economic contributions can be better understood when viewed in relation to the CNMI economy as a whole, which is summarized in Table 4-5. As this table illustrates, the 1,369 jobs directly and indirectly supported by OIA payments represent 5% of CNMI's total employment in 2009. Similarly, $17 million of employee compensation associated with these employees accounts for approximately 5% of total employee compensation inside the region, and the $35.7 million of GDP associated with these employees represents 5% of total GDP produced by the region.

Table 4-5. CNMI: Estimated Impacts Relative to National Economy (FY 2011)

	Total Economic Impact for FY 2011 OIA Payments	National Data	Impact as Percentage of Total Economy
Employment (#)	1,369	27,897	5%
Employee compensation ($'000, 2010$)	17,036	355,350	5%
GDP ($'000, 2010$)	35,702	727,744	5%

Sources: RTI estimates based on GAO (2011), Census (2009, 2011b), and CNMI Department of Commerce (2009). All data were adjusted to 2010 dollars using the consumer price index (BLS, 2011).

SECTION 5
U.S. VIRGIN ISLANDS (USVI)

5.1 FY 2011 OIA Payments Summary

USVI is the wealthiest of the insular areas, with an average GDP per capita nearly as high as that for the entire United States. In 2009, the GDP per capita in USVI was about $36,860 (2010$) compared with $46,504 in the United States that same year (BEA, 2011; World Bank, 2011a). Among the major factors underlying USVI's economy are tourism and the oil refining industry. The economy of USVI contracted in 2008 and 2009, largely due to an increase in imported petroleum products and declines in tourism spending economy (BEA, 2011).

OIA payments to USVI in 2011 totaled $105.7 million (Table 5-1). According to the OIA's 2010 Congressional District Report, $102.6 million in payments was specifically directed to USVI in FY 2011 (OIA, 2011a). The remaining $3.1 million came from other OIA payments that are spent across the insular areas (see Appendix A). The largest block of OIA payments to USVI came in the form of Rum Excise Tax Payments totaling $100 million. Under current U.S. law, excise taxes are collected on rum imported into the United States that is not of USVI or Puerto Rican origin. A fixed percentage of these excise taxes is distributed by the U.S. government to USVI. Although this funding is not designated for a particular purpose, USVI generally uses it to finance public infrastructure or provide support to the rum industry (Maguire and Teefy, 2010). The Assistance to Territories payments totaled about $5.6 million and provided for general technical assistance for direct grants, economic development, judicial training, the Close Up Foundation, and the PITI-VITI, which are jointly managed by the USDA Graduate School. USVI experienced a decline in OIA payments from FY 2010 to FY 2011, mostly because of lower expected returns from the rum excise taxes.

Through other Assistance to Territories programs, which made up $3.1 million in payments, OIA funds items such as wastewater improvements, USVI construction as part of the Northern Mariana Covenant Grant, and the Coral Reef Initiative. OIA has also been funding the rehabilitation of piping in sections of the territories' wastewater system to help the territory meet U.S. Environmental Protection Agency standards (OIA, 2011b).

5.2 Direct Economic Impacts of OIA Payments

Direct economic impacts of OIA payments were assigned to three economic sectors—education, construction, and government. To calculate the employment and employee

Table 5-1. USVI: OIA Payments by Appropriation (FY 2011)

Appropriation	Spending ($'000, 2010$)	Impact Treatment
Fiscal Payment		
USVI rum excise tax payments	100,000	Government
Total, Fiscal Payments	*100,000*	
Assistance to Territories		
General technical assistance—Direct grants	1,819	Government
General technical assistance—Judicial training	46	Government
General technical assistance—USDA Graduate School PITI-VITI	213	Education
General technical assistance—Close Up Foundation	150	Education
Subtotal, General Technical Assistance	*2,227*	
Coral Reef Initiative	250	Government
Northern Mariana Covenant Grants—USVI construction	2,194	Construction
Office of Insular Affairs	120	Government
Wastewater project	900	Construction
Subtotal, Other	3,464	
Total, Assistance to Territories	*5,691*	
Total Spending Inside Virgin Islands	**105,691**	

Source: RTI estimates based on OIA (2011b).

compensation impacts associated with this spending, as described in the methodology, we used the following "output" and employee compensation-to-employee ratios:[1]

- **Education:** Based on sales and employment data from the 2007 Economic Census for USVI, the average output per worker ratio in the education sector (NAICS 61) was $66,737 per employee (Census, 2009). Adjusting this ratio to 2010 dollars gives an output-to-employee ratio of **$70,185**. Based on payroll and employment data from the Census 2009 County Business Patterns for USVI, the average employee compensation-to-employee ratio in the education sector was $25,810 per employee. Adjusting this ratio to 2010 dollars gives an employee compensation-to-employee ratio of **$26,234** (Census, 2011b).
- **Construction:** Based on sales and employment data from the 2007 Economic Census for USVI, the average output per worker ratio in the construction sector (NAICS 23) was $103,782 per employee (Census, 2009). Adjusting this ratio to 2010 dollars gives an output-to-employee ratio of **$109,145**. Based on payroll and employment data from the Census 2009 County Business Patterns for USVI, the average employee

[1]All adjustments for inflation were made using the U.S. Consumer Price Index for All Urban Consumers (BLS, 2011).

compensation-to-employee ratio in the construction sector was $31,574 per employee (Census, 2011b). Adjusting this ratio to 2010 dollars gives an employee compensation-to-employee ratio of **$32,092**.

- **Government:** According to the U.S. Virgin Islands Annual Economic Indicators (U.S. Virgin Islands Bureau of Economic Research, 2011), the government revenue-to-employee ratio in 2010 was **$40,607**. Because data on government employee compensation were unavailable, the average payroll-per-worker ratio for nonagricultural private-sector workers ($31,305) from the Census 2009 County Business Patterns was used as a proxy (Census, 2011b). Adjusting for inflation, this implies an employee compensation-to-employee ratio of **$31,818**.

Dividing the payments directed toward each sector by the employment and employee compensation ratios yields the direct employment and employee compensation impacts reported in Table 5-2.

Table 5-2. USVI: Estimated Direct Economic Impacts (FY 2011)

Industry	FY 2011 Payments ($'000, 2010$)	Output-to-Employee Ratio ($/employee)	Employee Compensation-to-Employee Ratio ($/employee)	Direct Employment Impact (#)	Direct Employee Compensation Impact ($'000, 2010$)
Education	363	70,185	26,234	5	135
Construction	3,094	109,145	32,092	28	910
Government	102,234	40,607	31,818	2,518	80,107
Total	**105,691**			**2,551**	**81,152**

Sources: RTI estimates based on Census (2009, 2011b), OIA (2011b), and U.S. Virgin Islands Bureau of Economic Research (2011). All data were adjusted to 2010 dollars using the consumer price index (BLS, 2011).

5.3 Indirect and Induced Economic Impacts (Base Multipliers)

The employment and employee compensation multipliers were developed using the employment and employee compensation data presented in Table 5-3. This table was developed from a combination of data sources. First, employment and employee compensation information for nonagricultural, private-sector industries was obtained from the Census 2009 County Business Patterns. Next, employment and employee compensation data for the agricultural industry were obtained from the 2007 Agricultural Census (USDA, 2009c). Lastly, employment associated with the federal and territorial governments was obtained for 2009 from the USVI Annual Economic Indicators (U.S. Virgin Islands Bureau of Economic Research, 2011). To estimate employee compensation information for these government workers, we used the average employee compensation-per-worker ratio for nonagricultural, private-sector industries.

Table 5-3. USVI: Estimated Employment and Employee Compensation by Industry (2009)

Industry	Employment (#)	Employee Compensation ($'000, 2010$)
Economic Base Industries		
Agriculture	511	525
Government—Federal government	1,001	31,850
Government—Territorial government[a]	12,009	382,108
Mining, quarrying, and oil and gas extraction	10	963
Manufacturing	1,750	177,350
Tourism—Accommodation and food services	6,569	147,317
Tourism arts, entertainment, and recreation	593	12,817
Noneconomic Base Industries		
Administrative and support and waste management and remediation services	1,871	47,822
Construction	2,316	74,324
Educational services	880	23,086
Finance and insurance	1,407	66,702
Health care and social assistance	1,974	59,222
Information	803	34,835
Management of companies and enterprises	99	4,666
Other services (except public administration)	2,093	62,695
Professional, scientific, and technical services	1,189	57,354
Real estate and rental and leasing	1,261	40,434
Retail trade	6,751	141,927
Transportation and warehousing	1,636	50,229
Utilities	101	8,726
Wholesale trade	672	22,889
Total	**45,495**	**1,447,841**

[a] Note that because only 20% of USVI's budget comes from external sources, we assumed that only 20% of the employment and employee compensation associated with the territorial government was part of the base sector. The remaining employees and employee compensation were assumed to be part of the nonbase sector.

Sources: RTI estimates based on Census (2009, 2011b), OIA (2011b), BEA (2011), USDA (2009c), and U.S. Virgin Islands Bureau of Economic Research (2011). All data were adjusted to 2010 dollars using the consumer price index (BLS, 2011).

The economic base of USVI is agriculture, fishing, mining, manufacturing, and federal government activities. Industries supported by tourism can also be considered part of the economic base. Ideally, data would be available on measures of the number of employees supported by tourism. However, because these data were unavailable, we assumed that the entire accommodation and food services industries are supported by tourism and therefore part of the economic base.[2] This is likely a conservative approach because, to the extent that this approximation overrepresents the portion of the economy supported by tourism, employment and employee compensation multipliers will be reduced.

In addition to these industries, a portion of USVI's territorial government is considered part of the economic base. Because 20% of USVI's government revenue comes from external sources, 20% of territorial government employment was also included in the base employment for the purpose of calculating base multipliers (GAO, 2006).[3] Based on these assumptions and the data in Table 5-3, we calculated the following multipliers:

- **Base employment multiplier:** Base employment was calculated to include 12,835 employees out of a total of 45,495. Dividing total employment by base employment yields a multiplier of **3.54**, meaning that for every base employment position supported by OIA funding, an estimated 2.54 additional jobs are formed elsewhere in the economy.
- **Employee compensation multiplier:** Employee compensation associated with base employment was estimated to be $447 million. Dividing total employee compensation by base employee compensation yields a base multiplier of **3.24**, meaning that every dollar of employee compensation supported by the 2010 spending will create an additional $2.24 in employee compensation.

Multiplying the direct employment impact and employee compensation impacts in Table 5-2 by these multipliers yields a total employment impact of 9,043 employees and a total employee compensation impact of $262.7 million.

5.4 Summary Economic Impact Estimate for FY 2011

In summary, the $105.7 million spent by OIA directly supports 2,551 jobs and $81.1 million in employee compensation. Accounting for the multiplier process, we estimate that OIA spending supports a total of 9,043 jobs and $262.7 million in employee compensation.

[2] A similar approach for creating a proxy for measuring the role of tourism in insular area economies was used in GAO (2006).

[3] In addition to payments from OIA and the Department of the Interior, the government of USVI also receives support from various other federal government agencies, including the Department of Education and Department of Homeland Security (GAO, 2006).

Because GDP multipliers could not be computed as a result of data unavailability, the impact of OIA payments on GDP was estimated by multiplying the number of jobs supported through OIA by the ratio of GDP to total employees. GDP for USVI was estimated to be $4,243 in 2009, or $4,323 in 2010 dollars (BEA, 2011). Dividing this estimate by the total number of employees reported earlier yields a GDP-to-employee ratio of $94,793 per worker. Multiplying this ratio by the direct and total employment impacts calculated above, *we estimate that OIA spending supports direct GDP impacts of $241.8 million and total impacts of $857.2 million.* A summary of economic impact measures is presented in Table 5-4.

Table 5-4. USVI: Total Estimated Economic Impact (FY 2011)

	Direct Economic Impact	Indirect/Induced Economic Impact	Total Economic Impact
Employment (#)	2,551	6,492	9,043
Employee compensation ($'000, 2010$)	81,152	181,558	262,710
GDP ($'000, 2010$)	241,829	615,374	857,203

Sources: RTI estimates based on Census (2009, 2011b), OIA (2011b), BEA (2011), and USDA (2009c). All data were adjusted to 2010 dollars using the consumer price index (BLS, 2011).

The significance of OIA's economic contributions can be better understood when viewed in relation to the USVI economy as a whole, which is summarized in Table 5-5. As this table illustrates, the 9,043 jobs directly and indirectly supported by OIA payments represent 20% of USVI's total employment in 2009. Similarly, $262.7 million of employee compensation associated with these employees accounts for approximately 18% of total employee compensation inside the region, and the $857.2 million of GDP associated with these employees represents 20% of total GDP produced by the region.

Table 5-5. USVI: Estimated Impacts Relative to National Economy (FY 2011)

	Total Economic Impact for FY 2011 OIA Payments	National Data	Impact as Percentage of Total Economy
Employment (#)	9,043	45,495	20%
Employee compensation ($'000, 2010$)	262,710	1,447,841	18%
GDP ($'000, 2010$)	857,203	4,312,597	20%

Sources: RTI estimates based on Census (2009, 2011b), OIA (2011b), BEA (2011), and USDA (2009c). All data were adjusted to 2010 dollars using the consumer price index (BLS, 2011).

SECTION 6
FEDERATED STATES OF MICRONESIA (FSM)

6.1 FY 2011 OIA Payments Summary

The FSM is among the least wealthy of the insular areas, with an average GDP per capita of about $2,402 in 2008. According to the OIA (2011b), FSM's gross national product (GNP) averaged a 0.1% loss every year from 2000 to 2007. As a result, FSM faces severe challenges in implementing effective government, education, and health care systems and relies heavily on OIA support. FSM's economy is based in large part on the fishing industry, which earns income through licensing fees charged to foreign tuna fishing vessels for fishing rights in FSM's exclusive economic zone.

OIA payments to FSM in 2011 totaled $110.6 million. A detailed breakdown of these payments is presented in Table 6-1. According to OIA's 2010 Congressional District Report, $107.3 million in payments was specifically directed to FSM in FY 2011 (OIA, 2011a). The remaining $3.3 million came from other OIA payments that are spent across the insular areas (see Appendix A). The largest block of OIA payments to FSM, totaling $108.6 million, came through the Compact of Free Association. The Compact provides essential funding for operating FSM's education, health care, and government systems and improves the insular area's infrastructure.

Payments associated with Assistance to Territories totaled $2 million. General technical assistance provided direct grants, judicial training, the Close Up Foundation, the Prior Service Benefits Program, and the PITI-VITI. Other Assistance to Territories programs included items such as the Coral Reef Initiative. OIA funds the U.S. Postal Service to provide mail service to the insular area, and because this payment is a direct transfer, this value was not included in the analysis of the direct impacts of OIA's assistance. Therefore, the total amount of OIA payments spent within FSM is about $109.2 million.

6.2 Direct Economic Impacts of OIA Payments

Direct economic impacts of OIA payments were assigned to five economic sectors—education, construction, government, health care, and an assortment of private industries through the spending of Prior Service Benefits recipients. To calculate the employment and employee

Table 6-1. FSM: OIA Payments by Appropriation (FY 2011)

Appropriation	Spending ($'000, 2010$)	Impact Treatment
Compact of Free Association		
Federal services assistance	1,409	Internal transfer
Judicial training U.S. territories	168	Government
Education	28,377	Education
Health	21,004	Health care
Capacity building	2,672	Government
Private sector	2,619	Government
Environment	1,665	Government
Infrastructure	24,186	Construction
Other	26,534	Government
Total, Compact of Free Association	*108,633*	
Assistance to Territories		
General technical assistance—Direct grants	12	Government
General technical assistance—Judicial training	46	Government
General technical assistance—USDA Graduate School PITI-VITI	213	Education
General technical assistance—Close Up Foundation	150	Education
General technical assistance—Micronesian Center for Sustainable Future	111	Education
Subtotal, General Technical Assistance	441	Private
Maintenance assistance	973	
Coral Reef Initiative	788	Government
Subtotal, Other	*1,038*	
Total, Assistance to Territories	*2,011*	
Total Payments	**110,644**	
Spending Outside FSM	**1,409**	
Total Spending Inside FSM	**109,235**	

Source: OIA, 2011b.

compensation impacts associated with this spending, as described in the methodology, we used the following output and employee compensation-to-employee ratios:[1]

- **Education:** Based on employment and gross wage data provided in Fiscal Year 2008 Economic Review for FSM (OIA, 2009), the employee compensation-to-employee ratio for private-sector workers in the education sector was $5,000 in 2008. Adjusting for inflation, this yields an employee compensation-to-employee ratio of **$5,064** in 2010 dollars. Because information was not available for output associated with the education industry, the output-to-employee ratio for American Samoa was used ($47,227). American Samoa was chosen to be the best point of comparison in this context because economic metrics, such as GDP per capita, were more similar to FSM than for any other area for which output-per-worker data were available. However, it should be noted that to the extent this proxy overestimates the true output per-worker ratio for FSM the direct impacts of OIA spending will be underestimated because more jobs will be supported by each dollar of OIA spending.
- **Construction:** Based on employment and gross wage data provided in Fiscal Year 2008 Economic Review for FSM (OIA, 2009), the employee compensation-to-employee ratio for private-sector workers in the construction sector was $4,962 in 2008. Adjusting for inflation, this yields an employee compensation-to-employee ratio of **$5,025** in 2010 dollars. Because information was not available for output associated with the construction industry, the output-to-employee ratio for American Samoa was used ($55,140).
- **Government:** According to the Fiscal Year 2008 Economic Review for FSM (OIA, 2009), the government of Micronesia received approximately $149.8 million in revenue and employed approximately 6,389 individuals in 2008. Adjusting for inflation, this implies an output-to-employee ratio of **$23,746**. Similarly, according to information presented in the same report, these workers received approximately $25.6 million in employee compensation in 2008. Adjusting for inflation, this implies an employee compensation-to-employee ratio of **$4,051** in 2010 dollars.
- **Health care:** Based on employment and gross wage data provided in Fiscal Year 2008 Economic Review for FSM (OIA, 2009), the employee compensation-to-employee ratio for private-sector workers in the health care sector was $8,539 in 2008. Adjusting for inflation, this yields an employee compensation-to-employee ratio of **$8,649**. Because information was not available for output associated with the health care industry, the output-to-employee ratio for American Samoa was used ($39,380).
- **Private:** Based on employment and gross wage data provided in Fiscal Year 2008 Economic Review for FSM (OIA, 2009), the average wage for a private-sector worker was $4,214 in 2008. Adjusting for inflation gives an employee compensation-to-employee ratio of **$4,268** in 2009 dollars. Because information was not available for output associated with the private sector, the output-to-employee ratio for American Samoa was used ($119,518).

[1]All adjustments for inflation were made using the U.S. Consumer Price Index for All Urban Consumers (BLS, 2011).

Dividing the payments directed toward each sector by the employment and employee compensation ratios yields the direct employment and employee compensation impacts reported in Table 6-2.

Table 6-2. FSM: Estimated Direct Economic Impacts (FY 2011)

Industry	FY 2011 Payments ($'000, 2010$)	Output-to-Employee Ratio ($/employee)	Employee Compensation-to-Employee Ratio ($/employee)	Direct Employment Impact (#)	Direct Employee Compensation Impact ($'000, 2010$)
Education	28,850	47,227	5,064	611	3,093
Construction	24,186	55,140	5,025	439	2,204
Government	34,754	23,746	4,051	1,464	5,929
Health care	21,004	39,380	8,649	533	4,613
Private	441	119,518	4,268	4	16
Total	**109,235**			**3,050**	**15,855**

Sources: RTI estimates based on OIA (2009) and OIA (2011b). All data were adjusted to 2010 dollars using the consumer price index (BLS, 2011).

6.3 Indirect and Induced Economic Impacts (Base Multipliers)

The employment and employee compensation multipliers were developed using 2008 employment and gross wage data from the Micronesia Fiscal Year 2008 Economic Review (Table 6-3).

The economic base of FSM is agriculture, fishing, manufacturing, and federal government activities. Industries supported by tourism can also be considered part of the economic base. Ideally, data would be available on the number of employees who are supported by tourism. However, because these data were unavailable, we assumed that the entire accommodation and food services industries are supported by tourism and are, therefore, part of the economic base.[2] This is likely a conservative approach because, to the extent that this approximation overrepresents the portion of the economy supported by tourism, employment and employee compensation multipliers will be reduced.

In addition to these industries, a portion of FSM's territorial government is considered part of the economic base. Specifically, because over half of FSM's government revenue comes from external sources, approximately 67% of public administration was also included in the base

[2]A similar approach for creating a proxy for measuring the role of tourism in insular area economies was used in GAO (2006).

Table 6-3. FSM: Estimated Employment and Employee Compensation by Industry (2008)

Industry	Employment (#)	Employee Compensation ($'000, 2010$)
Economic Base Industries		
Agriculture, hunting, and forestry	26	69
Fishing	229	965
Extra-territorial organizations	59	252
Government (Public administration)[a]	6,389	25,883
Manufacturing	117	431
Tourism—Hotels and restaurants	832	2,986
Noneconomic Base Industries		
Construction	765	3,844
Education	889	4,502
Electricity, gas, and water supply	339	1,272
Financial intermediation	216	1,805
Health and social work	97	839
Other services	689	2,358
Private households with employed persons	5	13
Real estate, renting, and business activities	440	2,027
Transport, storage, and communications	1,121	5,417
Wholesale and retail trade and repairs	3,205	13,008
Total	**15,418**	**65,670**

[a] Because only 67% of FSM's budget comes from external sources, it was assumed that only 67% of the employment and employee compensation associated with public administration was part of the base sector. The remaining employees and employee compensation were assumed to be part of the nonbase sector.

Note: A significant portion of employment across all sectors was accounted for by public enterprises. However, employee compensation statistics were only provided for private-sector workers. Therefore, to estimate total employee compensation for all workers across industries, we assumed that the employee compensation-to-employee ratio was the same for public-sector workers and private-sector workers in each industry.

Source: RTI estimates based on OIA (2009).

employment for the purpose of calculating base multipliers.[3] Based on these assumptions and the data in Table 6-3, we calculated the following multipliers:

- **Base employment multiplier:** Base employment was calculated to include 5,544 employees out of a total of 15,418. Dividing total employment by base employment yields a multiplier of **2.78**, meaning that for every base employment position

[3] Based on GAO (2008), over half of FSM's government revenue is derived from external sources. RTI estimates the specific portion to be approximately 67% based on OIA payments to the region in FY 2010 (over $100 million) compared with government revenue in 2008 ($150 million) (OIA, 2009).

supported by OIA funding, an estimated 1.78 additional jobs are formed elsewhere in the economy.

- **Employee compensation multiplier:** Employee compensation associated with base employment was estimated to be $22 million. Dividing total employee compensation by base employee compensation yields a base multiplier of 2.98, meaning that every dollar of employee compensation supported by the 2011 spending will create an additional $1.98 in employee compensation.

Multiplying the direct employment and employee compensation impacts in Table 6-2 by these multipliers yields a total employment impact of 8,483 employees and $47.2 million of employee compensation.

6.4 Summary Economic Impact Estimate for FY 2011

In summary, the $109.2 million spent by OIA inside FSM directly supports 3,050 jobs, $15.9 million in employee compensation, and a $52.5 million in GDP. Accounting for the multiplier process, we estimate that OIA spending supports a total of 8,483 jobs, $47.2 million in employee compensation, and $145.9 million in GDP. This information is summarized in Table 6-4.

Table 6-4. FSM: Total Estimated Economic Impact (FY 2011)

	Direct Economic Impact	Indirect/Induced Economic Impact	Total Economic Impact
Employment (#)	3,050	5,433	8,483
Employee compensation ($'000; 2010$)	15,855	31,378	47,234
GDP ($'000; 2010$)	52,453	93,430	145,884

Sources: RTI estimates based on OIA (2011b), OIA (2009), and World Bank (2011a). All data were adjusted to 2010 dollars using the consumer price index (BLS, 2011).

Because GDP multipliers could not be computed as a result of data unavailability, the impact of OIA payments on GDP was estimated by multiplying the number of jobs supported through OIA by the ratio of GDP to total employees. GDP for FSM was estimated to be $261.8 million in 2008 or $265.1 million in 2010 dollars (World Bank, 2011a). Dividing this estimate by the total number of employees reported yields a GDP-to-employee ratio of $17,197 per worker. Multiplying this ratio by the direct and total employment impacts calculated above, we estimated that OIA spending supports direct GDP impacts of $52.5 million and total impacts of $145.9 million. A summary of the economic impacts associated with OIA payments is presented in Table 6-4.

The significance of OIA's economic contributions can be better understood when viewed in relation to the FSM economy as a whole, which is summarized in Table 6-5. The 8,483 jobs directly and indirectly supported by OIA payments represent 55% of FSM's total employment in 2008. Similarly, $47.2 million of employee compensation associated with these employees accounts for approximately 72% of total employee compensation inside the region, and the $145.9 million of GDP associated with these employees represents 55% of the $265.1 million of total GDP produced by the region.

Table 6-5. FSM: Estimated Impacts Relative to National Economy (FY 2011)

	Total Economic Impact for FY 2011 OIA Payments	National Data	Impact as Percentage of Total Economy
Employment (#)	8,483	15,418	55%
Employee compensation ($'000, 2010$)	47,234	65,670	72%
GDP ($'000, 2010$)	145,884	265,148	55%

Sources: RTI estimates based on OIA (2011b), OIA (2009), and World Bank (2011a). All data were adjusted to 2010 dollars using the consumer price index (BLS, 2011).

SECTION 7
REPUBLIC OF THE MARSHALL ISLANDS (RMI)

7.1 FY 2011 OIA Payments Summary

Along with FSM, RMI is among the least wealthy of the insular areas, with an average GDP per capita of only about $2,883 in 2010. As a result, RMI faces severe challenges in implementing effective government, education, and health care systems and relies heavily on OIA support. RMI's economy is based on fishing, subsistence farming, and production of copra, its largest export. The public sector is also a significant factor in RMI's economy. From 1999 to 2007, RMI's real GNP increased every year but has contracted since 2008 largely due to expansionary fiscal policy reaching its limits OIA, 2010).

OIA payments to RMI in 2011 totaled $71.6 million. A detailed breakdown of these payments is presented in Table 7-1. According to OIA's 2010 Congressional District Report, $66.6 million in payments was specifically directed to RMI in FY 2011 (OIA, 2011a). The remaining $4.9 million came from other OIA payments that are spent across the insular areas (see Appendix A).The largest block of OIA payments, totaling $68 million in spending inside RMI, came through the Compact of Free Association. The Compact provides essential funding for operating RMI's education, government, and health care systems; improving infrastructure; and protecting the environment. In 2011, the Compact and Ebeye Special Needs contributed nearly 50% of the funding available for education in RMI and 40% of the budget for health care (OIA, 2011b). Assistance to Territories payments totaled $3.5 million. General technical assistance provided direct grants, judicial training, the 4 Atoll Health Care Program (which provides health care services, including a full-time primary care physician for each atoll, for Enewetak, Bikini, Rongelap, and Utrik), the Close Up Foundation, the Prior Service Benefits Program, and PITI-VITI. Other Assistance to Territories programs included items such as the Coral Reef Initiative.

OIA provides funding to the U.S. Postal Service to provide mail service to the insular area, and because this payment is a direct transfer this value was not included in the analysis of the direct impacts of OIA's assistance. Similarly, 31% of funding for the Enewetak assistance program provides imported food for the citizens of this atoll and, thus, was not included in the analysis because this assistance is not being spent in the insular area. Therefore, the total amount of OIA payments spent within RMI is about $70 million.

Table 7-1. RMI: OIA Payments by Appropriation (FY 2011)

Appropriation	Spending ($'000, 2010$)	Impact Treatment
Compact of Free Association		
Federal services	1,409	Internal transfer
Enewetak	500	31%, spent outside area, 69% government
Judicial training U.S. territories	168	Government
Education	11,839	Education
Health	6,835	Health care
Capacity building	300	Government
Infrastructure	10,296	Construction
Environment	325	Construction
Ebeye Special Needs—Education	1,743	Education
Ebeye Special Needs—Health care	1,743	Health care
Kwajalein environmental impact	225	Government
Other	32,662	Government
Total, Compact of Free Association	*68,046*	
Assistance to Territories		
General technical assistance—4 Atoll Health Care Program	987	Health care
General technical assistance—Direct grants	1,485	Government
General technical assistance—Judicial training	46	Government
General technical assistance—USDA Graduate School PITI-VITI	213	Education
General technical assistance—Close Up Foundation	150	Education
General technical assistance—Prior Service Benefits Program	147	Private
Subtotal, General Technical Assistance	*3,027*	
Coral Reef Initiative	50	Government
Maintenance assistance	340	Government
Office of Insular Affairs	95	Government
Subtotal, Other	*485*	
Total, Assistance to Territories	*3,512*	
Total Payments	**71,558**	
Spending Outside RMI	**1,564**	
Total Spending Inside RMI	**69,994**	

Source: RTI estimates based on OIA (2011b).

7.2 Direct Economic Impacts of OIA Payments

Direct economic impacts of OIA payments were assigned to five economic sectors—education, construction, government, health care, and an assortment of private industries through the spending of Prior Service Benefits recipients. To calculate the employment and employee compensation impacts associated with this spending, as described in the methodology, we used the following output and employee compensation-to-employee ratios:[1]

- **Education:** Based on FY 2010 employment and wage cost data provided in the Fiscal Year 2009 Economic Review for RMI (released in August 2010), the employee compensation-to-employee ratio for private-sector workers in the education sector was **$13,092** in 2010 (OIA, 2010). Because information was not available for output associated with the education industry, the output-to-employee ratio for American Samoa was used ($47,227). American Samoa was chosen to be the best point of comparison in this context because economic metrics, such as GDP per capita, were more similar to RMI than for any other area for which output-per-worker data were available. However, it should be noted that to the extent this proxy overestimates the true output-per-worker ratio for RMI the direct impacts of OIA spending will be underestimated because more jobs will be supported by each dollar of OIA spending.
- **Construction:** Based on employment and wage cost data provided in the Fiscal Year Economic Review for RMI, the employee compensation-to-employee ratio for private-sector workers in the construction sector was estimated to be **$7,060** in 2010 (OIA, 2010). Because information was not available for output associated with the construction industry, the output-to-employee ratio for American Samoa was used ($55,140).
- **Government:** Based on data provided in the Fiscal Year 2009 Economic Review for RMI, the RMI government received approximately $104.9 million in revenue and employed approximately 3,403 individuals in 2009 (OIA, 2010). Adjusting for inflation, this implies an output-to-employee ratio of **$31,331** in 2010 dollars. Similarly, 3,393 government workers received $40.2 million in employee compensation in 2010. Adjusting for inflation, this implies an employee compensation-to-employee ratio of **$11,860**.
- **Health care:** Based on employment and wage cost data provided in the Fiscal Year 2009 Economic Review for RMI, the employee compensation-to-employee ratio for private-sector workers in the health care sector was estimated to be **$9,859** in 2010 (OIA, 2010). Because information was not available for output associated with the health care industry, the output-to-employee ratio for American Samoa was used ($39,380). American Samoa was chosen to be the best point of comparison in this context because economic metrics, such as GDP per capita, were more similar to RMI than for any other area for which data were available.

[1] All adjustments for inflation were made using the U.S. Consumer Price Index for all Urban Consumers (BLS, 2011).

- **Private:** According to the Fiscal Year 2009 Economic Review for RMI, the average wage for a private worker in RMI was estimated to be **$5,014** in 2010 (OIA, 2010). Because information was not available for output associated with the private industry, the output-to-employee ratio for American Samoa was used ($119,518). American Samoa was chosen to be the best point of comparison in this context because economic metrics, such as GDP per capita, were more similar to RMI than for any other area for which data were available.

Dividing the payments directed toward each sector by the employment and employee compensation ratios yields the direct employment and employee compensation impacts reported in Table 7-2.

Table 7-2. RMI: Estimated Direct Economic Impacts (FY 2011)

Industry	FY 2011 Payments ($'000, 2010$)	Output-to-Employee Ratio ($/employee)	Employee Compensation-to-Employee Ratio ($/employee)	Direct Employment Impact (#)	Direct Employee Compensation Impact ($'000, 2010$)
Education	13,945	47,227	13,092	295	3,866
Construction	10,621	55,140	7,060	193	1,360
Government	35,715	31,331	11,860	1,140	13,520
Health care	9,565	39,380	9,859	243	2,395
Private	147	119,518	5,014	1	6
Total	**69,994**			**1,872**	**21,146**

Sources: RTI estimates based on OIA (2011b) and OIA (2010). All data were adjusted to 2010 dollars using the consumer price index (BLS, 2011).

7.3 Indirect and Induced Economic Impacts (Base Multipliers)

The employment and employee compensation multipliers were developed for 2010 using data from the RMI Fiscal Year 2009 Economic Review (Table 7-3).

The economic base of RMI is agriculture, hunting, forestry, manufacturing, and federal government activities. Industries supported by tourism can also be considered part of the economic base. Ideally, data would be available on the number of employees supported by tourism. However, because these data were unavailable, we assumed that the entire

Table 7-3. RMI: Estimated Employment and Employee Compensation by Industry (2010)

Industry	Employment (#)	Employee Compensation ($'000, 2010$)
Economic Base Industries		
Agriculture, hunting, and forestry	25	76
Fishing	969	3,169
Extra-territorial organizations	1,022	16,043
Government (Public administration)[a]	3,393	40,242
Manufacturing	43	322
Tourism—Hotels and restaurants	262	1,369
Noneconomic Base Industries		
Community, social & personal service activities	127	808
Construction	587	4,144
Education	447	5,852
Electricity, gas and water supply	311	4,121
Financial intermediation	213	3,234
Health and social work	256	2,524
Private households with employed person	8	39
Real estate, renting, and business activities	270	1,961
Transport, storage, and communications	638	6,232
Wholesale and retail trade	1,749	8,751
Total	**10,320**	**98,887**

[a] Because only two-thirds of RMI's budget comes from external sources, we assumed that only two-thirds of the employment and employee compensation associated with public administration was part of the base sector. The remaining employees and employee compensation were assumed to be part of the nonbase sector.

Note: A significant portion of employment across all sectors was accounted for by public enterprises. However, employee compensation statistics were provided only for private-sector workers. Therefore, to estimate total employee compensation for all workers across industries, we assumed that the employee compensation-to-employee ratio was the same for public-sector workers and private-sector workers in each industry.

Source: RTI estimates based on OIA (2010).

accommodation and food services industries are supported by tourism and are, therefore, part of the economic base.[2] This is likely a conservative approach because, to the extent that this approximation overrepresents the portion of the economy supported by tourism, employment and employee compensation multipliers will be reduced.

[2] A similar approach for creating a proxy for measuring the role of tourism in insular area economies was used in GAO (2006).

In addition to these industries, a portion of RMI's territorial government is considered part of the economic base. Specifically, because approximately two-thirds of RMI's government revenue comes from external sources, two-thirds of public administration was also included in the base employment for the purpose of calculating base multipliers (GAO, 2008). Based on these assumptions and the data in Table 7-3, we calculated the following multipliers:

- **Base employment multiplier:** Base employment was calculated to include 4,583 employees out of a total of 10,320. Dividing total employment by base employment yields a multiplier of **2.25**, meaning that for every base employment position supported by OIA funding, an estimated 1.25 additional jobs are formed elsewhere in the economy.
- **Employee compensation multiplier:** Employee compensation associated with base employment was estimated to be $47.8 million. Dividing total employee compensation by base employee compensation yields a base multiplier of **2.07**, meaning that every dollar of employee compensation supported by the 2010 spending will create an additional $1.07 in employee compensation.

Multiplying the direct employment and employee compensation impacts in Table 7-2 by these multipliers yields a total employment impact of 4,215 employees and $43.7 million of employee compensation.

7.4 Summary Economic Impact Estimate for FY 2011

In summary, the $70 million spent by OIA in RMI directly supports 1,872 jobs and $21.1 million in employee compensation. Accounting for the multiplier process, we estimate that OIA spending supports a total of 4,215 jobs and $43.7 million in employee compensation. This information is summarized in Table 7-4.

Table 7-4. RMI: Total Estimated Economic Impact (FY 2011)

	Direct Economic Impact	Indirect/Induced Economic Impact	Total Economic Impact
Employment (#)	1,872	2,343	4,215
Employee compensation ($'000, 2010$)	21,146	22,594	43,740
GDP ($'000, 2010$)	28,261	35,377	63,637

Sources: RTI estimates based on OIA (2011b), OIA (2010), and World Bank (2011a). All data were adjusted to 2010 dollars using the consumer price index (BLS, 2011).

Because GDP multipliers could not be computed as a result of data unavailability, the impact of OIA payments on GDP was estimated by multiplying the number of jobs supported through OIA by the ratio of GDP to total employees. GDP for RMI was estimated to be $155.8

million in 2010. Dividing this estimate by the total number of employees reported earlier yields a GDP-to-employee ratio of $15,197 per worker (World Bank, 2011a). Multiplying this ratio by the direct and total employment impacts calculated above, *we estimate that OIA spending supports direct GDP impacts of $28.3 million and total impacts of $63.6 million.*

The significance of OIA's economic contributions can be better understood when viewed in relation to the RMI economy as a whole, which is summarized in Table 7-5. As this table illustrates, the 4,215 jobs directly and indirectly supported by OIA payments represent 41% of RMI's total employment in 2010. Similarly, $43.7 million of employee compensation associated with these employees accounts for approximately 44% of total employee compensation inside the region, and the $63.6 million of GDP associated with these employees represents 41% of total GDP produced by the region.

Table 7-5. RMI: Estimated Impacts Relative to National Economy (FY 2011)

	Total Economic Impact for FY 2011 OIA Payments	National Data	Impact as Percentage of Total Economy
Employment (#)	4,215	10,320	41%
Employee compensation ($'000, 2010$)	43,740	98,887	44%
GDP ($'000, 2010$)	63,637	155,800	41%

Sources: RTI estimates based on OIA (2011b), OIA (2010), and World Bank (2011a). All data were adjusted to 2010 dollars using the consumer price index (BLS, 2011).

SECTION 8
REPUBLIC OF PALAU

8.1 FY 2011 OIA Payments Summary

Like the other insular areas, Palau faces a number of obstacles to economic development, including limited land and resources, a small population, limited local technical expertise, a narrow economic base, and vulnerability to natural disasters. The average GDP per capita for Palau in 2008 was $8,331(2010$) as compared with the GDP per capita of the United States in 2008, which was $47,572 in 2010 dollars (World Bank, 2011a). Through their funding and support, OIA strives to foster economic development, promote sound management, and improve quality of life in Palau.

In September 2010, the governments of the United States and Palau signed a new 15-year compact agreement that offers $250 million in assistance through 2024. The assistance will fund direct economic assistance and infrastructural projects, and the amount of funding will decline each year to promote Palau's self-sufficiency (OIA, 2011b). This funding will be dispersed through the OIA office and will begin in FY 2012; for FY 2011 Palau received assistance through compact extensions with OIA.

OIA payments made inside Palau in 2011 totaled $15.7 million and were primarily dedicated to the government sector with some additional support for education and the private sector. A detailed breakdown of OIA payments to Palau is presented in Table 8-1. According to the OIA's 2010 Congressional District Report, $14 million in payments was specifically directed to Palau in FY 2011 (OIA, 2011a). The remaining $1.7 million came from other OIA payments that are spent across the insular areas (see Appendix A). The largest block of OIA payments to Palau, totaling $14 million in spending inside the island, came through the Compact of Free Association. This includes the Palau Compact Extension and the Palau Program Grant Assistance, a special fund set aside for education programs.

Assistance to Territories payments totaled $1.7 million. General technical assistance provided direct grants, judicial training, the Close Up Foundation, the Prior Service Benefits Program, and the PITI-VITI.

8.2 Direct Economic Impacts of Payments

Direct economic impacts of OIA payments were assigned to three economic sectors—education, government, and an assortment of private industries through the spending of Prior Service Benefits recipients. To calculate the employment and employee compensation impacts

Table 8-1. Palau: Grant Spending by Appropriation (FY 2011)

Appropriation	Spending ($'000, 2010$)	Impact Treatment
Compact of Free Association		
Palau Compact Extension	12,000	Government
Palau program grant assistance	2,000	Education
Total, Compact of Free Association	*14,000*	
Assistance to Territories		
General technical assistance—Direct grants	1,081	Government
General technical assistance—Judicial training	46	Government
General technical assistance—USDA Graduate School PITI-VITI	213	Education
General technical assistance—Close Up Foundation	150	Education
General technical assistance—Prior Service Benefits Program	188	Private
Subtotal, General Technical Assistance	*1,677*	
Total, Assistance to Territories	*1,677*	
Total Spending Inside Palau	***15,677***	

Source: RTI estimates based on OIA (2011b).

associated with this spending, as described in the methodology, we used the following output and employee compensation-to-employee ratios: [1]

- **Education:** Based on 2008 quarterly employment and gross wage reports from the Palau Office of Planning and Statistics (POPS), the average employee compensation per worker in the education sector in 2008 was $9,559. Adjusting for inflation, this implies an employee compensation-to-employee ratio of **$9,681** in 2010 dollars. Because information was not available for output associated with the education sector, the output-to-employee ratio for American Samoa was used ($47,227). American Samoa was chosen to be the best point of comparison in this context because economic metrics, such as GDP per capita, were more similar to Palau than for any other area for which data were available. However, it should be noted that to the extent this proxy overestimates the true output-per-worker ratio for Palau the direct impacts of OIA spending will be underestimated because more jobs would be supported by each dollar of OIA spending.
- **Government**: Based on data reports by the Asian Development Bank, the government of Palau received $83.3 million in revenue in 2008 and employed approximately 3,029 people that year (ADB, 2011; POPS, 2008). This implies the

[1] All adjustments for inflation were made using the U.S. Consumer Price Index for all Urban Consumers (BLS, 2011).

ratio of government revenue to government employees was $27,505 in 2008, or **$27,857** in 2010 dollars. Similarly, based on 2008 quarterly employment and gross wage reports from POPS, the employee compensation-to-employee ratio for public administration sector workers was estimated to be $13,217 in 2008, or **$13,386** in 2010 dollars.

- **Private:** Based on quarterly employment and gross wage/salary reports from POPS, 8,637 workers were located in the private sector who received $58.2 million in employee compensation in 2008, or $59.1 million in 2010 dollars. This implies an average employee compensation-per-worker ratio of **$6,822** in 2010 dollars. Because information was not available for output associated with the private sector, the output-to-employee ratio for American Samoa was used ($119,518).

Dividing the payments directed toward each sector by the employment and employee compensation ratios yields the direct employment and employee compensation impacts reported in Table 8-2.

Table 8-2. Palau: Estimated Direct Economic Impacts (FY 2011)

Industry	FY 2011 Payments ($'000, 2010$)	Output-to-Employee Ratio ($/employee)	Employee Compensation-to-Employee Ratio ($/employee)	Direct Employment Impact (#)	Direct Employee Compensation Impact ($'000, 2010$)
Education	2,363	47,227	9,681	50	484
Government	13,127	27,857	13,386	471	6,308
Private	188	119,518	6,822	2	11
Total	**15,677**			**523**	**6,803**

Sources: RTI estimates based on OIA (2011b) and POPS (2008). All data were adjusted to 2010 dollars using the consumer price index (BLS, 2011).

8.3 Indirect and Induced Economic Impacts (Base Multipliers)

The employment and employee compensation multipliers were developed using POPS data. The latest year for which data were available was 2008; wages were totaled across all four quarters, and employment was averaged across all four quarters (Table 8-3).

The economic base of Palau is agriculture, hunting, forestry, manufacturing, and federal government activities. Industries supported by tourism can also be considered part of the economic base. Ideally, data would be available on measures of the number of employees who are supported by tourism. However, because these data were unavailable, we assumed that the entire accommodation and food services industries are supported by tourism and are, therefore,

Table 8-3. Palau: Estimated Employment and Employee Compensation by Industry (2008)

Industry	Employment (#)	Employee Compensation ($'000, 2010$)
Economic Base Industries		
Agriculture, hunting, and forestry	129	413
Fishing	149	630
Extra-territorial organizations	13	160
Government (Public administration)[a]	3,029	40,539
Mining and quarrying	17	146
Manufacturing	377	2,698
Tourism—Hotels and restaurants	1,655	10,435
Noneconomic Base Industries		
Construction	981	5,669
Education	560	5,416
Financial intermediation	145	2,398
Health and social work	101	616
Other service activities	277	1,306
Private households with employed person	847	1,484
Real estate, renting, and business activities	675	6,719
Transport, storage, and communications	894	8,630
Wholesale and retail trade; repair of motorcycles; personal and household goods	1,831	12,356
Total	**11,678**	**99,615**

[a] Note that because only 50% of Palau's budget comes from external sources, it was assumed that only 50% of the employment and employee compensation associated with public administration was part of the base sector. The remaining employees and employee compensation were assumed to be part of the nonbase sector.

Source: POPS, 2008.

part of the economic base.[2] This is likely a conservative approach because, to the extent that this approximation overrepresents the portion of the economy supported by tourism, employment and employee compensation multipliers will be reduced.

In addition to these industries, a portion of Palau's territorial government is considered part of the economic base. Because approximately half of Palau's government revenue came

[2] A similar approach for creating a proxy for measuring the role of tourism in insular area economies was used in GAO (2006).

from external sources from 2000 to 2006, 50% of public administration was included in the base employment for the purpose of calculating base multipliers (GAO, 2008). Based on these assumptions and the data in Table 8-3, we calculated the following multipliers:

- **Base employment multiplier:** Base employment was calculated to include 3,855 employees out of a total of 11,678. Dividing total employment by base employment yields a multiplier of **3.03**, meaning that for every base employment position supported by OIA spending, an estimated 2.03 additional jobs are formed elsewhere in the economy.
- **Employee compensation multiplier:** Employee compensation associated with base employment was estimated to be $34.8 million. Dividing total employee compensation by base employee compensation yields a base multiplier of **2.87**, meaning that every dollar of employee compensation supported by the FY 2011 spending will create an additional $1.87 in employee compensation.

Multiplying the direct employment and employee compensation impacts in Table 8-2 by these multipliers yields a total employment impact of 1,584 employees and $19.5 million of employee compensation.

8.4 Summary Economic Impact Estimate for FY 2011

In summary, the $14,791,000 spent by OIA inside Palau directly supports 523 jobs and $6.8 million in employee compensation. Accounting for the multiplier process, we estimate that OIA spending supports a total of 1,584 jobs and $19.5 million in employee compensation.

Because GDP multipliers could not be computed as a result of data unavailability, the impact of OIA payments on GDP was estimated by multiplying the number of jobs supported through OIA by the ratio of GDP to total employees. GDP for Palau was estimated to be $166.4 million in 2008, or $168.5 in 2009 dollars (World Bank, 2011a). Dividing this estimate by the total number of employees reported earlier yields a GDP-to-employee ratio of $14,430 per worker. Multiplying this ratio by the direct and total employment impacts calculated above, *we estimate that OIA spending generates direct GDP impacts of $7.5 million and total GDP impacts of $22.9 million***.** A summary of the economic impacts associated with OIA payments is presented in Table 8-4.

The significance of OIA's economic contributions can be better understood when viewed in relation to the Palau economy as a whole, which is summarized in Table 8-5. Specifically, the 1,584 jobs directly and indirectly supported by OIA payments represent 14% of Palau's total employment. Similarly, $19.5 million of employee compensation associated with these

Table 8-4. Palau: Total Estimated Economic Impact (FY 2011)

	Direct Economic Impact	Indirect/Induced Economic Impact	Total Economic Impact
Employment (#)	523	1,061	1,584
Employee compensation ($'000, 2010$)	6,803	12,697	19,500
GDP ($'000, 2010$)	7,544	15,314	22,858

Sources: RTI estimates based on OIA (2011b), POPS (2008), and World Bank (2011a). All data were adjusted to 2010 dollars using the consumer price index (BLS, 2011).

Table 8-5. Palau: Estimated Impacts Relative to National Economy (FY 2011)

	Total Economic Impact for FY 2011 OIA Payments	National Data	Impact as Percentage of Total Economy
Employment (#)	1,584	11,678	14%
Employee compensation ($'000, 2010$)	19,500	99,615	20%
GDP ($'000, 2010$)	22,858	168,522	14%

Sources: RTI estimates based on OIA (2011b), POPS (2008), and World Bank (2011a). All data were adjusted to 2010 dollars using the consumer price index (BLS, 2011).

employees accounts for approximately 20% of total employee compensation inside the region, and the $22.9 million of GDP associated with these employees represents 14% of total GDP produced by the region.

SECTION 9
DISTRICT OF COLUMBIA AND HAWAII

The economic impact of OIA operations in the District of Columbia and Hawaii was calculated using IMPLAN I/O modeling software.[1] Unlike modeling for the insular areas, IMPLAN uses an I/O modeling framework that allows specific multipliers to be calculated for each industry. The economic model was modified for each area so that spending associated with OIA's Washington, DC, and Hawaii operations would be consistent with data provided in the Budget Justification. Specifically, the Budget Justification indicates that $9.28 million of funding was allocated to OIA for continued operations and for continued employment of 41 full-time equivalents (FTEs) being paid $5.2 million in employee compensation and benefits. This implies that the funding-per-worker ratio was $226,341 and that the employee compensation-per-worker ratio was $126,537. These data were used to modify the assumptions underlying the IMPLAN model.

9.1 Economic Impact Assessment of OIA Operations in Washington, DC

The FY 2011 budget for OIA operations and the Coral Reef Initiative in Washington, DC, was $7.5 million, which falls within the IMPLAN industry code 506: Federal Non-Military. Similar to the analysis used for the insular areas, direct employment and employee compensation impacts can be measured using the output-per-worker and employee compensation-per-worker ratios for this sector.

Direct impacts were multiplied by IMPLAN-generated multipliers to estimate the total impact of OIA activity in Washington, DC. The relevant multipliers and total impacts that were estimated for this analysis are reported in Table 9-1. The total economic impacts of OIA operations on DC are

- 40 employees,
- $4.46 million in employee compensation, and
- $8.76 million in output.

[1] To estimate the total economic impact associated with this funding, we used 2004 I/O models of the Washington, DC, and Hawaii economies constructed using IMPLAN economic modeling software. IMPLAN categorizes businesses in these industries into a system of 509 industry codes. IMPLAN was selected because it is one of the most widely used I/O modeling software packages in economic development analysis. IMPLAN, like all I/O models, quantifies the economic impact using multipliers to represent indirect and induced impacts. Total impacts can be estimated by multiplying the direct impacts of the project by these multipliers.

Table 9-1. Economic Impact Assessment of OIA Operations in Washington, DC (FY 2011)

Federal Nonmilitary (506)	Employment (# of workers)	Employee Compensation ($2010 millions)	Output ($2010 millions)
Direct Economic Impact			
OIA operations	33	$4.21	$7.52
Indirect and Induced Economic Impacts			
Multiplier	1.22	1.06	1.16
Total Economic Impact	**40**	**$4.46**	**$8.76**

Sources: RTI estimates based on OIA (2011b) and IMPLAN.

9.2 Economic Impact Assessment of OIA Operations in Hawaii

The FY 2011 budget for OIA operations in Hawaii was $13.3 million. The details of these payments and the IMPLAN codes to which they were assigned are reported in Table 9-2.

Table 9-2. 2011 OIA Operations in Hawaii and Corresponding IMPLAN Codes

Funding Description	Funding Amount ($2009)	Industry Description	IMPLAN Code
OIA	$1,100,000	Federal nonmilitary	506
Pacific Basin Development Center	$199,153	Grant making and giving and social advocacy	492
University of Hawaii/Pacific Business Center	$33,684	Other state and local government enterprises	499
Maintenance assistance	$208,000	Federal nonmilitary	506
Brown Treesnake Control	$300,000	Federal nonmilitary	506

Sources: RTI estimates based on OIA (2011b) and IMPLAN.

As in the previous analysis, direct impacts were estimated using output and employee compensation-to-employee ratios from the IMPLAN model. The direct employment, employee compensation, and output inputs are reported in Table 9-3.

As previously discussed, direct impacts were multiplied by Type II SAM multipliers generated in IMPLAN to estimate the total impact of OIA payments on the state's economy. The relevant multipliers that were estimated for this analysis are reported in Table 9-4.

Table 9-3. Direct Economic Impacts of OIA Operations in Hawaii (FY 2011)

Industry Description	IMPLAN Code	Employment (# of workers)	Employee Compensation ($2009 millions)	Output ($2009 millions)
Federal nonmilitary	506	7	$0.90	$1.61
Other state and local government enterprises	499	0	$0.01	$0.03
Grant making and giving and social advocacy	492	4	$0.22	$0.20
Other educational services	463	4	$0.09	$0.21
Hospitals	467	90	$5.55	$11.23

Sources: RTI estimates based on OIA (2011b) and IMPLAN.

Table 9-4. Selected Multipliers by Industry, Hawaii

Industry Description	IMPLAN Code	Total Employment Impact Multiplier	Total Employee Compensation Multiplier	Total Output Impact Multiplier
Federal nonmilitary	506	1.82	1.24	1.41
Other state and local government enterprises	499	2.06	1.74	1.62
Grant making and giving and social advocacy	492	1.66	1.43	2.40
Other educational services	463	1.33	1.51	1.64
Hospitals	467	1.76	1.47	1.71

Source: IMPLAN.

Using these multipliers, we can compute the total economic impacts associated with OIA operations in Hawaii. The total economic impacts of this activity in Hawaii are

- 184 employees,
- $9.75 million in employee compensation, and
- $22.35 million in output.

These impacts are reported in Table 9-5.

Table 9-5. Total Economic Impacts of OIA Payments, Hawaii

Industry Description	IMPLAN Code	Employment (# of workers)	Employee Compensation ($2009 millions)	Output ($2009 millions)
Federal nonmilitary	506	12.7	$1.11	$2.27
Other State and local government enterprises	499	0.3	$0.02	$0.05
Grant making and giving and social advocacy	492	6.4	$0.32	$0.48
Other educational services	463	4.9	$0.13	$0.35
Hospitals	467	159.4	$8.18	$19.20
Total[a]		**184**	**$9.75**	**$22.35**

[a] Values may not add to total because of rounding.

Sources: RTI estimates based on OIA (2011b) and IMPLAN.

SECTION 10
ANALYSIS SUMMARY

The purpose of this study was to measure the economic impact of OIA payments on insular areas as measured by economic aggregates such as employment, employee compensation, and GDP. This task was accomplished primarily through the use of simple economic base models that were constructed for each of the seven insular areas. The results of this analysis are presented in the following tables and in the Executive Summary.

Table 10-1. Estimated Employment Impact of OIA Payments (FY 2011)

	Direct Employment Impact (#)	Indirect/Induced Employment Impact (#)	Total Employment Impact (#)	Percentage of National Employment Supported by OIA Payments (%)
American Samoa	885	867	1,752	11%
Guam	1,550	3,368	4,918	7%
Northern Mariana Islands	372	997	1,369	5%
U.S. Virgin Islands	2,551	6,492	9,043	20%
Micronesia	3,050	5,433	8,483	55%
Marshall Islands	1,872	2,343	4,215	41%
Palau	523	1,061	1,584	14%
Total	**10,803**	**20,561**	**31,364**	**16%**

Source: RTI estimates.

Table 10-2. Estimated Employee Compensation Impact of OIA Payments (FY 2011)

	Direct Employee Compensation Impact ('000, 2010$)	Indirect/Induced Employee Compensation Impact ('000, 2010$)	Total Employee Compensation Impact ('000, 2010$)	Percentage of National Employee Compensation Supported by OIA Payments (%)
American Samoa	10,667	12,400	23,067	13%
Guam	36,388	91,848	128,237	8%
Northern Mariana Islands	4,127	12,909	17,036	5%
U.S. Virgin Islands	81,152	181,558	262,710	18%
Micronesia	15,855	31,378	47,234	72%
Marshall Islands	21,146	22,594	43,740	44%
Palau	6,803	12,697	19,500	20%
Total	**176,139**	**365,384**	**541,523**	**14%**

Source: RTI estimates.

Table 10-3. Estimated GDP Impact of OIA Payments (FY 2011)

	Direct GDP Impact ('000, 2010$)	Indirect/Induced GDP Impact ('000, 2010$)	Total GDP Impact ('000, 2010$)	Percentage of National GDP Supported by OIA Payments (%)
American Samoa	40,970	40,132	81,103	11%
Guam	103,494	224,897	328,392	7%
Northern Mariana Islands	9,695	26,007	35,702	5%
U.S. Virgin Islands	241,829	615,374	857,203	20%
Micronesia	52,453	93,430	145,884	55%
Marshall Islands	28,261	35,377	63,637	41%
Palau	7,544	15,314	22,858	14%
Total	**484,248**	**1,050,530**	**1,534,778**	**14%**

Source: RTI estimates.

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APPENDIX A
ALLOCATION OF FY 2011 TECHNICAL ASSISTANCE AND OTHER PAYMENTS BY INSULAR AREA

OIA grants and federal payments for technical assistance and other initiatives are made or distributed as needed during each fiscal year. Table A-1 presents a breakdown of general technical assistance by grant/program and by the insular area receiving the funds. In several cases, the exact amount of funding going to each insular area was indicated in the Budget Justification. However, in several cases, information was not available for how the funds associated with particular grants/programs would be distributed by area, so we made assumptions. These cases included the following:

- Allocation for the Direct Grants to Insular Areas, part of General Technical Assistance funding, was not available at the time of this report. Therefore, RTI applied percentage distributions based on the FY 2010 budget (Table A-2).
- USDA Graduate School PITI-VITI: A total of $1.7 million was allocated to this program for FY 2011. Because the PITI-VITI serves all seven insular areas, this $1.7 million was distributed evenly across all seven areas and Hawaii (where the PITI-VITI offices are located).
- Close Up Foundation: A total of $1.05 million was allocated to this program for FY 2010. This money is received directly by the Close Up Foundation, but no additional information for how these funds might be distributed across each insular areas was provided. Therefore, the $1 million was divided evenly across all seven insular areas.
- Prior Service Benefits Program: A total of $1 million was allocated to this program, which is distributed to 364 recipients in CNMI, 717 in FSM, 239 in RMI, and 305 in Palau. It was assumed that this $1 million was distributed to each of these insular areas in proportion to the number of recipients located in each.
- Judicial training: A total of $320,000 was allocated to this program for FY 2011. Without additional information, these funds were distributed evenly across the seven insular areas.
- At the time of this report, the exact funding awards for the University of Hawaii's Pacific Business Center, Micronesian Center for Sustainable Future, and U.S. Department of Energy (NREL) were not available. Without additional information for a better determination, RTI split the remaining General Technical Assistance funding by applying a percentage distribution of FY 2010's budget (Table A-2).

For several other categories of OIA funding, the actual allocation by insular area was unknown, but information about the total amount of funding for the funding category was listed. RTI was able to use the funding totals and percentage distribution from FY 2010's budget to estimate FY 2011 allocations by island for the brown tree snake program, maintenance assistance, and water and wastewater projects (Table A-2).

Table A-1. Estimation of FY 2011 General Technical Assistance by Area

	Treatment	American Samoa	Guam	CNMI	U.S. Virgin Islands	Federated States of Micronesia	Republic of Marshall Islands	Republic of Palau	Hawaii	Other	Total
Direct grants to insular areas	Government	$1,080,463	$1,266,658	$813,111	$1,818,662	$12,085	$1,484,590	$1,081,178			$7,556,747
USDA Graduate School PITI-VITI	Education	$212,500	$212,500	$212,500	$212,500	$212,500	$212,500	$212,500	$212,500		$1,700,000
U.S. Bureau of Commerce, BEA (for GDP data)	Internal transfer									$600,000	$600,000
Close Up Foundation	Education	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000	$150,000			$1,050,000
Junior Statesmen	Spending outside insular areas									$276,100	$276,100
4 A Toll Health Care Program	Health care						$986,926				$986,926
Pacific Basin Development Center	Government								$199,153		$199,153
Prior Service Benefits Program	Private			$224,000		$441,231	$147,077	$187,692			$1,000,000
Judicial training	Government	$45,714	$45,714	$45,714	$45,714	$45,714	$45,714	$45,714			$320,000
CDC	Internal transfer									$50,000	$50,000
CNMI Ombudsman's Office	Government			$250,000							$250,000
CNMI Immigration, Labor and Law Enforcement	Government			$1,000,000							$1,000,000
University of Hawaii/Pacific Business Center Pr.	Government								33,684		$33,684
Micronesian Center for Sustainable Future	Education					110,972					$110,972
U.S. Department of Energy (NREL)	Internal transfer									168,419	$168,419
Total		$1,488,677	$1,674,872	$2,695,325	$2,226,877	$972,502	$3,026,807	$1,677,085	$445,337	$1,094,519	$15,302,000

Table A-2. Estimation for FY 2011 Payments by Insular Area Using FY 2010 Actuals

Insular Area	FY 2010 Actual Payments ($'000, 2009$)	FY 2010 Distribution, by Insular Area (%)	Estimated FY 2011 Payments ($'000, 2010$)
Brown Treesnake Control			
American Samoa	—	0.00%	—
Guam	2,345	78.17%	2,345
Northern Mariana Islands	355	11.83%	355
U.S. Virgin Islands	—	0.00%	—
Federated States of Micronesia	—	0.00%	—
Republic of the Marshall Islands	—	0.00%	—
Republic of Palau	—	0.00%	—
Hawaii	300	10.00%	300
Other	—	0.00%	—
Total	3,000		3,000
General Technical Assistance— Direct Grants to Insular Area			
American Samoa	894	14.30%	1,080
Guam	1,048	16.76%	1,267
Northern Mariana Islands	673	10.76%	813
U.S. Virgin Islands	1,505	24.07%	1,819
Federated States of Micronesia	10	0.16%	12
Republic of the Marshall Islands	1,228	19.65%	1,485
Republic of Palau	895	14.31%	1,081
Total	6,253		7,557
General Technical Assistance— Remaining Funds			
University of Hawaii/Pacific Business Center Pr.	150	10.76%	34
Micronesian Center for Sustainable Future	494	35.45%	111
U.S. Department of Energy (NREL)	750	53.80%	168
Total	1,394		313

(continued)

Table A-2. Estimation for FY 2011 Payments by Insular Area Using FY 2010 Actuals (continued)

Insular Area	FY 2010 Actual Payments ($'000, 2009$)	FY 2010 Distribution, by Insular Area (%)	Estimated FY 2011 Payments ($'000, 2010$)
Waste & Wastewater Projects			
American Samoa	—	0.00%	—
Guam	250	13.16%	250
Northern Mariana Islands	750	39.47%	750
U.S. Virgin Islands	900	47.37%	900
Federated States of Micronesia	—	0.00%	—
Republic of the Marshall Islands	—	0.00%	—
Republic of Palau	—	0.00%	—
Hawaii	—	0.00%	—
Other	—	0.00%	—
Total	1,900		1,900
Maintenance Assistance			
American Samoa	200	8.92%	200
Guam	320	14.28%	320
Northern Mariana Islands (CNMI)	141	6.29%	141
U.S. Virgin Islands	—	0.00%	—
Federated States of Micronesia	788	35.16%	788
Republic of the Marshall Islands	340	15.17%	340
Republic of Palau	—	0.00%	—
Hawaii	208	9.28%	208
Other	244	10.89%	244
Total	2,241		2,241

Source: RTI estimates based on OIA (2011b).