BEA BRIEFING

GDP for American Samoa, the Commonwealth of the Northern Mariana Islands, Guam, and the U.S. Virgin Islands

By Aya Hamano, Nicole M. Mayerhauser, Clinton P. McCully, Carol E. Moylan, and Marc Rubin

In early 2009, the Bureau of Economic Analysis (BEA) began work on a project to develop the first official estimates of gross domestic product (GDP) for American Samoa, the Commonwealth of the Northern Mariana Islands (CNMI), Guam, and the U.S. Virgin Islands. The estimates were developed in partnership with the Department of the Interior’s Office of Insular Affairs (OIA), which provided funding for this project (called the Statistical Improvement Program) and facilitated interactions between BEA and the territorial governments.1 The purpose of this ongoing project is to provide data users with a comprehensive, objective measure of economic growth for these four U.S. territories.

GDP measures the value of final goods and services produced by an economy (in this case, the economies of the four territories) in a given period. The estimates of total GDP described in this article were initially released in May. Estimates of the components of GDP were later released during separate visits to the four territories. According to these estimates, real GDP—GDP adjusted to remove price changes—grew in each of the territories except the CNMI from 2002 to 2007. American Samoa’s GDP grew at an average annual rate of 0.4 percent; Guam’s GDP grew at an average annual rate of 1.8 percent; and the U.S. Virgin Islands’ GDP grew at an average annual rate of 2.9 percent. In contrast, the CNMI’s GDP decreased at an average annual rate of 4.2 percent. (For comparison, the average annual growth rate for the United States excluding the territories was 2.7 percent over this period.)2

This GDP measurement project represents an important first step toward achieving BEA and OIA’s ultimate goal: to integrate these territories not only into the estimates of national GDP but also into the full set of the national income and product accounts (NIPAs). Currently, the NIPAs cover the 50 states and the District of Columbia, and transactions with the territories are included in transactions with the “rest-of-the-world.”

A primary obstacle to realizing this long-term goal is the lack of coverage of these four territories by most of the major surveys used by BEA to produce its estimates of GDP and related economic measures.3 Because the territories are not within the scope of most of these surveys, BEA depended heavily on the assistance and information provided by each of the territorial governments. (For a complete list of contributors, see the box “Acknowledgments.”)

The estimates of GDP for American Samoa, the CNMI, Guam, and the U.S. Virgin Islands are presented in this article. The accompanying tables show

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1. OIA is the federal agency that manages the federal government’s relations with the governments of American Samoa, CNMI, Guam, and the U.S. Virgin Islands. It works with these territories to encourage economic development, transparency of government, financial stability, and accountability.

2. Before the release of the 2010 annual revision of the NIPAs, the average annual growth rate for U.S. real GDP from 2002 to 2007 was 2.8 percent, as stated in the territorial GDP releases.

3. These surveys include merchant wholesale trade and retail trade surveys; the annual capital expenditures survey; value of construction put in place; the service annual survey; the annual survey of manufactures; manufacturers’ shipments, inventories, and orders; and government finances.
estimates of GDP and its major components, including consumer spending, private fixed investment, private inventory investment, net exports of goods and services, and government spending. The methods used to derive the estimates for all four territories are described in the appendix “Summary of Methodologies.”

**Real GDP Growth Highlights**

**American Samoa**

From 2002 to 2007, real gross domestic product of American Samoa increased at an average annual rate of 0.4 percent. Real GDP increased in each year except 2006 (table 1). The population of American Samoa increased at an average annual rate of 2.3 percent, and per capita real GDP decreased at an average annual rate of 1.9 percent. The price index for GDP decreased at an average annual rate of 0.5 percent; the price index for consumer spending increased at an average annual rate of 3.0 percent.

The largest private industry in American Samoa from 2002 to 2007 was the tuna canning industry. Between 2002 and 2007, the tuna canneries share of total private employment averaged 42 percent. Exports of the canneries accounted for over 90 percent of total exports from 2002 to 2007. Imports associated with the canneries accounted for a large portion of total imports. These imports included tin plates, landed fish, and petroleum products used by the canneries. The primary component of inventory investment was tin plates used by the canneries.

The estimates of GDP for American Samoa show the impact of the tuna canning industry on the economic growth of the territory. Changes in exports, imports, and inventory investment associated with the tuna canning industry accounted for much of the year-to-year variation in real GDP growth between 2002 and 2007. For example, the increase in real GDP in 2005 reflected an increase in cannery exports and a decrease in cannery imports that were partly offset by a decrease in cannery inventory investment. The decrease in real GDP in 2006 reflected a decrease in cannery exports that was partly offset by a decrease in cannery imports and a smaller decumulation of cannery inventories.

Consumer spending and government spending also significantly affected economic growth from 2002 to 2007. The growth in real GDP in 2003 reflected an increase in consumer spending (in addition to an increase in government spending) and the decrease in private fixed investment in 2005 resulted in a decrease in real GDP.
increase in inventory investment of the canneries). Consumer spending also increased in 2004; however, this growth was offset by a decrease in government spending that reflected a decrease in major public construction projects. Government spending continued to decrease in each year from 2005 to 2007, largely reflecting decreases in public construction activity.

**Commonwealth of the Northern Mariana Islands**

From 2002 to 2007, real GDP of CNMI decreased at an average annual rate of 4.2 percent. Real GDP increased in 2003 but decreased in each year from 2004 to 2007 (table 2). The population of the CNMI decreased rapidly as foreign workers left the territory, and per capita real GDP increased at an average annual rate of 0.5 percent. The price index for GDP decreased at an average annual rate of 2.0 percent; the price index for personal consumption expenditures increased at an average annual rate of 0.4 percent.

From 2002 to 2007, the largest private industries in the CNMI were the garment manufacturing industry and the tourism industry. Exports associated with these industries accounted for the vast majority of exports of goods and services. Imports of the garment manufacturing industry were also a major component of total imports of goods. From 2002 to 2007, the garment manufacturing and tourism industries in the CNMI experienced a number of economic shocks. Garment manufacturing was impacted by a reduction of quotas on imports to the United States of foreign textiles and garments. Tourism was affected by the SARS epidemic, the outbreak of avian flu, and the suspension of two major airline carriers’ daily flights from Japan.6

The estimates of GDP for the CNMI highlight the impact that the garment manufacturing and tourism industries had on the CNMI’s economy. For example, the notable decrease in real GDP in 2005 reflected significant decreases in exports of garments and in exports of tourism services. Real GDP continued to decrease in 2006 and 2007, reflecting further decreases in both types of exports.7

Consumer spending and territorial government spending also contributed to variations in real GDP growth from 2002 to 2007. The increase in real GDP in 2003 was more than accounted for by an increase in

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7. According to data published by the CNMI Department of Commerce, from 2005 to 2007, exports of garments measured in current dollars fell by over 50 percent, and the number of visitor arrivals decreased by over 20 percent. See “Economic Indicator” (January–March 2009).
consumer spending.  

8. Prices of consumer goods and services decreased in 2003 (table 2). This decrease primarily reflected movements in the consumer price index for the territory published by the Central Statistics Division of the CNMI Department of Commerce.

9. The tourism industry in Guam is highly dependent on visitors from Asia, particularly visitors from Japan and Korea. Together, these two markets accounted for almost 90 percent of total air arrivals in Guam from 2002 to 2007. See Bureau of Statistics and Plans, Guam Statistical Yearbook (2008).

10. Guam’s economy was affected in 2003 by the aftermath of Typhoon Pongsona, which struck Guam in December 2002.

Table 3. Highlights of GDP Growth, Guam

<table>
<thead>
<tr>
<th>Percent Change From Preceding Year in Real GDP</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2002–2007 average</th>
</tr>
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<tbody>
<tr>
<td>Gross domestic product</td>
<td>2.0</td>
<td>0.5</td>
<td>2.4</td>
<td>5.5</td>
<td>1.7</td>
<td>1.9</td>
</tr>
<tr>
<td>Personal consumption expenditures</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Net exports of goods and services</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government consumption expenditures and gross investment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent Change From Preceding Year in Price Indexes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gross domestic product</td>
<td>0.5</td>
<td>0.5</td>
<td>2.4</td>
<td>5.5</td>
<td>1.7</td>
<td>1.9</td>
</tr>
<tr>
<td>Personal consumption expenditures</td>
<td>1.2</td>
<td>1.0</td>
<td>3.7</td>
<td>4.1</td>
<td>2.8</td>
<td>2.6</td>
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Real GDP

<table>
<thead>
<tr>
<th></th>
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<tr>
<td>Gross domestic product</td>
<td>3,651</td>
<td>3,643</td>
<td>3,936</td>
<td>4,100</td>
<td>3,959</td>
<td>3,988</td>
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<td>Personal consumption expenditures</td>
<td>2,503</td>
<td>2,293</td>
<td>2,455</td>
<td>2,589</td>
<td>2,554</td>
<td>2,601</td>
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<tr>
<td>Fixed investment</td>
<td>1,148</td>
<td>1,161</td>
<td>1,186</td>
<td>1,216</td>
<td>1,216</td>
<td>1,243</td>
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<tr>
<td>Net exports of goods and services</td>
<td>671</td>
<td>621</td>
<td>611</td>
<td>544</td>
<td>611</td>
<td>682</td>
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<tr>
<td>Imports</td>
<td>1,393</td>
<td>1,199</td>
<td>1,252</td>
<td>1,292</td>
<td>1,318</td>
<td>1,448</td>
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<td>Goods</td>
<td>456</td>
<td>48</td>
<td>58</td>
<td>52</td>
<td>51</td>
<td>53</td>
<td></td>
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<tr>
<td>Services</td>
<td>1,624</td>
<td>1,561</td>
<td>1,563</td>
<td>1,658</td>
<td>1,685</td>
<td>1,871</td>
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<tr>
<td>Territorial</td>
<td>640</td>
<td>656</td>
<td>686</td>
<td>746</td>
<td>780</td>
<td>847</td>
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<tr>
<td>Population (thousands)</td>
<td>161.1</td>
<td>163.6</td>
<td>166.1</td>
<td>168.6</td>
<td>171.0</td>
<td>173.5</td>
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<tr>
<td>Per capita real GDP (chained dollars)</td>
<td>22,869</td>
<td>22,269</td>
<td>23,698</td>
<td>24,333</td>
<td>23,149</td>
<td>22,991</td>
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</tbody>
</table>

1. Source: 2008 Guam Statistical Yearbook

Contributions to Percent Change in Real GDP

<table>
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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Gross domestic product</td>
<td>0.2</td>
<td>1.1</td>
<td>2.2</td>
<td>1.8</td>
<td>1.3</td>
<td>1.8</td>
</tr>
<tr>
<td>Personal consumption expenditures</td>
<td>-0.6</td>
<td>3.8</td>
<td>1.0</td>
<td>0.6</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>Fixed investment</td>
<td>0.8</td>
<td>0.9</td>
<td>1.0</td>
<td>1.1</td>
<td>0.8</td>
<td>0.8</td>
</tr>
<tr>
<td>Net exports of goods and services</td>
<td>1.2</td>
<td>2.2</td>
<td>1.8</td>
<td>1.7</td>
<td>1.3</td>
<td>1.4</td>
</tr>
<tr>
<td>Imports</td>
<td>0.9</td>
<td>1.2</td>
<td>1.3</td>
<td>1.6</td>
<td>1.0</td>
<td>1.0</td>
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<tr>
<td>Government consumption expenditures and gross investment</td>
<td>0.4</td>
<td>0.5</td>
<td>0.6</td>
<td>0.6</td>
<td>0.5</td>
<td>0.5</td>
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<tr>
<td>Federal</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Territorial</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
</tr>
</tbody>
</table>

1. These estimates are percent changes.

Guam

From 2002 to 2007, the real GDP of Guam grew at an annual average rate of 1.8 percent (table 3). The population increased at an average annual rate of 1.5 percent, and real GDP per capita increased at an average annual rate of 0.3 percent. The price index for GDP increased at an average annual rate of 1.9 percent; the price index for personal consumption expenditures increased at an average annual rate of 2.6 percent.

The primary sectors of Guam’s economy are government and tourism. The federal government’s presence in Guam is much larger than in American Samoa, the CNMI, and the U.S. Virgin Islands. In 2007, federal government expenditures accounted for more than 25 percent of current-dollar GDP; the majority of these expenditures reflected federal defense spending. Exports of tourism services were the primary component of exports of services, accounting for more than 15 percent of current-dollar GDP in 2007. Guam’s tourism industry was affected by a number of external factors during this period, including the SARS epidemic and the outbreak of avian flu that also affected the CNMI’s tourism industry.

The estimates of the major components of Guam’s GDP show that changes in government spending and in exports of tourism services accounted for much of the year-to-year volatility in real GDP growth. The estimates also show that changes in consumer spending significantly affected economic growth. The decrease in real GDP in 2003 reflected decreases in consumer spending and in exports of tourism services that were partly offset by a decrease in imports and an increase in government spending (including construction spending). After contracting in 2003, Guam’s economy rebounded in 2004. The growth in real GDP in 2004 was more than accounted for by decreases in territorial government spending and in consumer spending. The decrease in real GDP in 2005 reflected continued decreases in consumer spending and territorial government spending in addition to the decrease in exports. The decrease in real GDP in 2007 also reflected a significant decrease in territorial government spending.
in 2004 was more than accounted for by increases in consumer spending and in exports of tourism services.11 Real GDP continued to increase in 2005; this increase was more than accounted for by increases in consumer spending and in government spending. The largest contributor to the decrease in real GDP in 2006 was a decrease in exports of tourism services.12 In 2007, real GDP increased, reflecting positive contributions from all major components of GDP except net exports of goods and services; the largest positive contributions were from government spending and consumer spending.

**U.S. Virgin Islands**

From 2002 to 2007, real GDP of the U.S. Virgin Islands grew at an average annual rate of 2.9 percent. Real GDP decreased in 2003 but increased in each year from 2004 to 2007 (table 4). The population increased at an average annual rate of 0.8 percent, and per capita real GDP increased at an average annual rate of 2.0 percent. The price index for GDP increased at an average annual rate of 5.2 percent; the price index for personal consumption expenditures increased at an average annual rate of 4.5 percent.

The estimates of GDP for the U.S. Virgin Islands highlight the effect that the oil refining industry has had on the territory’s economic growth from 2002 to 2007. Along with tourism, oil refining ranks among the most important industries in the territory. In fact, the Hovensa oil refinery, located on St. Croix, is one of the world’s largest oil refiners. Changes in exports, imports, and investment (including inventory investment) associated with the oil refining industry accounted for much of the year-to-year variation in real GDP growth. For example, the decrease in real GDP in 2003 reflected a decrease in construction activity due to the completion in 2002 of several large private and public sector projects, including a $0.5 billion coker unit for the oil refinery on St. Croix.13 The increase in real GDP in 2005 also reflected an increase in construction activity associated with the oil refinery: specifically, the construction of a desulfurization unit that began in September of that year.14 The increase in real GDP in 2007 largely reflected trade activities associated with the oil refining industry. The decrease in imports of crude oil was far greater than the decrease in exports.

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12. The decrease in exports of tourism services partly reflected a decrease in average on-island expenditures by Japanese tourists. See 2008 Guam Statistical Yearbook.


of refined petroleum, resulting in a large increase in net exports of goods and services. A decrease in petroleum inventory investment partly offset the increase in net exports.

The strength of the private economy and growth in corporate profits tax revenue in 2006 and 2007 helped to fund increases in territorial government spending. These increases in government spending contributed significantly to real GDP growth in 2006 and 2007.

Other notable factors affecting economic growth in the U.S. Virgin Islands were changes in territorial government spending (other than those described above), changes in exports of tourism services, and changes in consumer spending. As noted previously, the decrease in real GDP in 2003 reflected the completion in 2002 of several private and public sector construction projects. The major government construction projects included the expansion of St. Croix’s Henry E. Rohlsen Airport and various road and housing construction projects. The increase in real GDP in 2004 largely reflected an increase in exports of tourism services, which is the primary component of exports of services for the U.S. Virgin Islands. In 2005 and 2006, increases in consumer spending contributed significantly to the increases in real GDP.

**Future Directions**

Over the next several months, BEA will continue to work closely with the territorial governments to extend the estimates of GDP for the four territories. Estimates for 2008 and 2009, in addition to revised estimates for 2002–2007, are scheduled to be released in the spring of 2011.

It is important to note that GDP is only one summary measure of economic activity. Future enhancements to the estimates for the four territories (subject to data availability) include developing other measures found in the full set of the NIPAs, such as personal income and saving rates.

**Appendix: Summary of Methodologies**

Gross domestic product (GDP) is measured as the sum of consumer spending (or “personal consumption expenditures”), private investment, net exports (exports less imports) of goods and services, and government spending (or “government consumption expenditures and gross investment”). The methodologies used to estimate the major components of GDP for American Samoa, the Commonwealth of the Northern Mariana Islands (CNMI), Guam, and the U.S. Virgin Islands are summarized below. These methods are consistent with the methods used to estimate U.S. GDP. Information from the Economic Census of Island Areas was used to establish levels of GDP for each territory for 2002 and 2007. Annual series were then developed and used to estimate GDP for the intervening years.

**Consumer spending.** Personal consumption expenditures (PCE) consists primarily of purchases of goods and services by households. For American Samoa, the CNMI, and Guam, economic census data on the consumer shares of sales for each industry sector were used to benchmark the estimates of household purchases of most goods. For the CNMI and Guam, annual growth rates for most goods and services were derived using gross business revenue data; for American Samoa, annual growth rates for most goods were derived using data on imports of goods. Annual estimates of goods for the U.S. Virgin Islands were mostly based on imports data from the Census Bureau’s U.S. Trade With Puerto Rico and U.S. Possessions (series FT895) and U.S. International Trade in Goods and Services (series FT900). Economic census data on the consumer shares of sales for each industry sector were used for all four territories to benchmark the estimates of most services except housing and utilities. Annual growth rates were derived primarily using gross business revenue data for the CNMI and Guam and wage data for American Samoa and the U.S. Virgin Islands. Housing services and utilities services were estimated independently. Housing services were estimated using information on the number of occupied housing units and average rental rates reported in the Census of Population and Housing. Utilities services were estimated using revenue data reported by government-owned utilities and by the U.S. Energy Information Administration. Other services not covered by the economic census —such as financial services furnished without payment, insurance, and sales by government—were also estimated independently.

**Private investment.** Private investment consists of spending on new fixed assets—equipment, software and structures by private businesses, and improvements to existing assets. It also includes the construc-
Acknowledgments

Aya Hamano of the Bureau of Economic Analysis (BEA) and Wali Osman of the Office of Insular Affairs (OIA) oversaw the preparation of the first official estimates of gross domestic product for American Samoa, the Commonwealth of the Northern Mariana Islands (CNMI), Guam, and the U.S. Virgin Islands.

From BEA, Clinton P. McCully prepared the estimates of GDP for American Samoa, Nicole M. Mayerhauser prepared the estimates of GDP for the CNMI and Guam, and Carol E. Moylan prepared the estimates of GDP for the U.S. Virgin Islands. Brent R. Moulton, Associate Director for National Economic Accounts, and Brian C. Moyer, Associate Director for Industry Economic Accounts, provided overall supervision.

Other significant contributors from BEA were: Jennifer A. Bennett, Elizabeth C. Bernstein, Eric A. Bryda, Benjamin D. Cowan, Matthew M. Donahoe, Alyssa E. Holdren, Robert J. Kornfeld, Dennis Lally, Kristina L. Maze, Charles Ian Mead, Edward T. Morgan, William H. Nicolls IV, Lisa C. Ninomiya, Nadia F. Sadéé, Andrew G. Schmidt, Shane T. Taylor, Elizabeth M. Terroni, and Matthew D. Tschetter.

From the U.S. Census Bureau, Marc Rubin prepared data analysis and provided a detailed methodological and data review of the GDP estimates. The Company Statistics Division provided data from the Economic Census of Island Areas.

From the U.S. Department of the Interior, Tony Babauta, Assistant Secretary for Insular Affairs, and Nikolao Pula, Director of OIA, provided support throughout the project. Lydia Faleafine-Nomura, Basil Ottley, and R. Jeffrey Schorr of OIA served as liaisons between BEA and the territorial governments.

Brian Hannon, Survey Statistics Consultant, provided Household Income and Expenditure Survey data.

BEA would also like to thank the governor’s offices of the four territories for their contributions. Governor Togiola T.A. Talufono and Lieutenant Governor Faaoa A. Sunia of American Samoa, Governor Benigno Fitial and Lieutenant Governor Eloy Inos of the CNMI, Governor Felix P. Camacho and Lieutenant Governor Michael W. Cruz, MD of Guam, and Governor John P. de Jongh and Lieutenant Governor Gregory R. Francis of the U.S. Virgin Islands contributed guidance and support throughout the project. Other key contributors are listed below.

**American Samoa:** Faleseu Eliu Paopao, Director, Department of Commerce (DOC); Lelei Peau, Deputy Director, DOC; Vai Filiga, Chief Statistician, DOC; Alex Zodiacal, Manager, DOC; Ma’u A-Leha, Economic Planner Practitioner, DOC; Melvin Joseph, Manager, Tax Office, Department of Treasury; and Glen Lefiti, Chief Customs Officer, Department of Treasury.

**CNMI:** Michael Adá, Secretary, Department of Commerce; Ivan A. Blanco, Director, Central Statistics Division (CSD); Justin H. Andrew, Computer Specialist, CSD; Edward Deleon Guerrero, Director, Commonwealth Ports Authority (CPA); MaryAnn Q. Lizama, Manager of the Port of Saipan, CPA; Derek T. Sasamoto, Comptroller, CPA; Perry J. P. Tenorio, Director, Marianas Visitors Authority (MVA); Judy C. Torres, Deputy Director, MVA; Robert A. Schrack, Acting Secretary, Department of Finance (DOF); Connie Salas, Acting Secretary, DOF; Canice Diaz, Revenue Agent, DOF; Marie T. Muna, Computer Programmer, DOF; Vivian P. Nogis, Statistics Specialist, DOF.

**Guam:** J. George Bamba, Chief of Staff, Office of the Governor; Alberto A. Lamorena V, Director, Bureau of Statistics and Plans (BSP); Albert Perez, Chief Economist, BSP; Machelle Leon Guerrero, Chief Planner, BSP; Bertha Duenas, Director, Bureau of Budget and Management; Lourdes Perez, Director, Department of Administration (DOA); Ken Borja, Management Analyst, DOA; Goody Rosario, Accounting Supervisor, DOA; Maria S. Connelly, Director, Department of Labor (DOL); Gary Hiles, Chief Economist, DOL; Gerard Limtiaco, Program Coordinator, DOL; Artemio Ilagan, Director, Department of Revenue and Taxation (DRT); Paul J. Pablo, Deputy Tax Commissioner, DRT; Jennifer Untalan, Revenue Agent, DRT; Doris F. Brooks, Public Auditor, Office of the Public Auditor; Gerry Perez, General Manager, Guam Visitors Bureau (GVB); Deborah M. Phillips, Administrator, GVB.

**U.S. Virgin Islands:** Lauritz Mills, Director, Virgin Islands Bureau of Economic Research (VIBER); Donnie Dorsett, Senior Economist, VIBER; Claudette Watson-Anderson, Director, Virgin Islands Bureau of Internal Revenue; Sandra Rey, Senior Research Analyst, Virgin Islands Department of Labor; Virgin Islands Office of Management and Budget; Virgin Islands Department of Finance.
tion of new residential structures and the improvements to these structures. Because of data limitations, estimates of private investment in equipment and software and in structures were indirectly measured. Investment in equipment and software was estimated based on the value of imports of capital goods or on economic census data on the business share of sales of the wholesale durable goods sector. Investment in structures was estimated using building permit data and construction industry receipts less sales to other construction firms and less sales to government as reported in the economic census.

**Net exports of goods and services.** The estimates of exports of goods to the United States from the four territories reflected data from the Census Bureau's FT895 publication. Estimates of exports of goods from American Samoa, the CNMI, and Guam to the rest of the world were based on information compiled by the territorial governments. Estimates of exports of goods from the U.S. Virgin Islands to the rest of the world were based on data from the series FT900 publication. Estimates of imports of goods for American Samoa, the CNMI, and Guam were based on values or quantities of imported commodities reported by the territorial governments. For the U.S. Virgin Islands, estimates of imports of goods reflected data from the series FT895 and FT900 publications.

Information on imports of services and on exports of services other than tourism was limited. Estimates of exports of tourism services for the CNMI and Guam were based on survey data on tourist expenditures and visitor arrivals provided by the territorial government visitors’ authorities. For the U.S. Virgin Islands, the estimate of exports of tourism services was based on total visitor expenditures published by the Virgin Islands Bureau of Economic Research.

**Government consumption expenditures and gross investment.** The estimates of government expenditures were prepared separately for the territorial governments and for the federal government sector. The primary sources of information for the territorial governments estimates were financial statements of the primary government and of the government component units. The main data source for the federal government estimates was the Consolidated Federal Funds Report, an annual report published by the U.S. Census Bureau.

**Estimates of real GDP.** Inflation-adjusted estimates of total GDP and its components were derived within a chain-type Fisher Index framework. For most of the detailed components of GDP, inflation-adjusted estimates were calculated by deflating each component using an appropriate price index. Consumer price indexes produced by each territorial government were used to deflate most of the detailed components of PCE. Inflation-adjusted estimates for most components other than PCE were calculated using U.S. prices from the U.S. Bureau of Labor Statistics.

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18. For American Samoa and the U.S. Virgin Islands, private investment also includes private inventory investment (or “change in private inventories”).
19. For Guam, after discussion with officials in the Guam Bureau of Statistics and Plans, it was assumed that a majority of the goods purchased by durable goods wholesalers for resale were imported.
20. The method assumed that the receipts by construction industry reported in the economic census were collected for work done in the same year.
21. Exports of tourism services were a small component of American Samoa’s economy and are not discussed.