

Acknowledgement

The American Samoa National Income and Product Accounts (NIPA) is a result of a process that was notable for its breadth and openness. The two year long, resource-intensive process took place under the auspices of the NIPA Task Force comprised of the Governor's Office, Treasury Department, Office of Planning and Budget, Bank of Hawaii-American Samoa Branch, ANZ-Amerika Samoa Bank, Development Bank of American Samoa, Chamber of Commerce, Social Security Office, Department of Commerce, Tax Office, Customs Office, American Samoa Telecommunication Authority, LBJ Medical Center Authority, Star Kist Samoa Inc., and COS Samoa Packing. The substantial achievements of the process were made possible through the close cooperation among members of the NIPA Task Force and contributions both cash and in kind from international organizations, and many individual experts in national accounting and related fields.

The NIPA Task Force is also in great appreciation of Dr. Marc Rubin whom was assigned by the International Program Center (IPC) of the Bureau of Census to work with the NIPA Task Force in developing the NIPA estimates. At the initial stage, Dr. Rubin prepared an action item check off list, which detailed what needed to be done. This action item check off list and other NIPA data requirements were reviewed during workshops (August 2002 & 2003) as well as other indirect consultations through emails and conference calls.

The American Samoa NIPA accounts and tables followed the US BEA framework were put together by members of the Department of Commerce Economic Core Group under the leadership of the Deputy Director, Mr. Lelei Peau, and assisted by Mr. Vaitoelau Filiga, Mr. Alex Zodiacal, Ms. Gene Brighthouse, Ms. Nancy Daschbach, Ms. Jane Klickman, and Ms. Ma'u 'Alipate-Leha.

Finally, mention should be made of the many staff members especially the NIPA Working Group namely Mr. Lelei Peau (Chairman), I'aulualo Fa'afetai Talia (Deputy Treasurer), Melvin Joseph (Tax Manager), Elvis Patea (Legal Counsel for ASTCA), Emau Amosa (LBJ Medical Authority), Vaitoelau Filiga (DOC), Suli Sopoaga (DBAS), Meki Solomona (Star Kist Samoa) who, greatly contributed to the completion of this semi annual report with their many professional, technical, and administrative skills that supported such a complex and long term work program.

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A) Executive Summary for NIPA Project to the Advisory Group

This report summarizes the progress the National Income and Product Accounts (NIPA) project team has made over the past 18 months (May 2002 – November 2003) in its attempts to measure economic activity in American Samoa. The NIPA Working Group team comprised of representatives/stakeholders from various government agencies and private sector businesses, with technical support provided by the DOC Economic Core Group under the leadership of Dr. Marc Rubin of the US Bureau of Census and Mr. Vai Filiga of the American Samoa Department of Commerce. The dedication and continuing hard work of the surveyors, technicians, statisticians, analysts and their leaders is to be highly commended for taking on a project of such scope and importance.

The primary objective of the NIPA data collection was to measure Gross Domestic Product (GDP) for American Samoa. The project strategy of the leaders mapped out the means for producing size estimates of the aggregate economy in the Territory. Project deliverables were defined as:

1. Annual estimates of GDP built from the expenditure and factor income sides,
2. A quinquennial benchmark estimate of GDP composed of sectoral value added, and
3. Host country institutionalization.

Both Rubin and Filiga agreed to base project implementation upon three activities:

1. Data assessment and inventory
2. Workshops to teach the mechanics of NIPA accounting and create a library of reference materials, and
3. Directed consultations to monitor progress, critique and revise estimates as they are produced

Since this was the maiden voyage of data collection and assessment for NIPA purposes, it was expected to uncover a number of problem areas. The most significant which have been identified are:

- Outdated statistical information on Personal Consumption Expenditure;
- Incomplete/inconsistent records on factor income (all income received by the local population);
- Partial records of investment activities;
- Excessively volatile trade data

Given the time and budget constraints imposed on the project, dealing with such issues has evolved into a series of short run “work arounds”. In essence, all major stakeholders have agreed that new data gathering initiatives must be mounted in the longer run to correct these problems. These initiatives must include:

1. Retail trade and service survey
2. Construction survey
3. Household Income and Expenditure Survey
4. Survey of Government Agencies including authorities and quasi-government operations
5. Employment and compensation

Overall, the technology transfer aspects, or the abilities of the ASG workers to train quickly and well for the jobs, was successful due in large part to the support and encouragement of the top levels of government. The leaders sent good people who were committed to attaining the project objectives, and as team players, they proved to be willing to breakdown departmental barriers when data access became an issue. To the credit of the troops on the front line, the staff mastered the fundamental NIPA methodologies, and brought keen insight into the nature and quality of the raw data sets.

During the process of analysis and reconstruction of the NIPA's, there have been three iterations, or processes for refining the basic data sets. Each successive refinement has yielded more complete and accurate estimates. The most noteworthy issues have been:

- developing procedures for estimating personal consumption from incomplete/dated information;
- creating trade deflation indices;
- developing estimates of the size of the informal sector.

Specific details follow in the text and tables.

For the time being, and until further anticipated iterations can be completed, the project provides the following results:

- The interim benchmark year 1999 GDP for American Samoa is \$444.2 million dollars with a Statistical Discrepancy of 6.7 percent
- Constant dollar GDP in 2000 for American Samoa is estimated at \$437.8 million dollars with a Statistical Discrepancy of 4.4 percent

From these figures, there appears to be a negative real growth of final expenditure GDP, implied at -1.44% . However this should not be cause for alarm since the estimates beyond 1999 are highly influenced by uncertain swings in trade and government expenditures, and have other embedded or unclear variances. For this reason, growth could in fact be zero or even positive given the amount of changeability or variance in the data. To make this point even clearer, individual table entries in 2000-2002 are given multiple asterisks wherever there is significant concern about their reliability. With further fine-tuning through the removal of imputations to agriculture and rents, 1999GDP is probably lower at \$369.6 million. If we focus on where the income streams are captured and consider Gross National Product (GNP), the figure could be smaller at \$350.7 million.

In the opinion of most economists, the portrait of economic activity at the country level does not necessarily represent the well being of the individual. For this reason, it is more enlightening to focus on personal income per capita¹. Census estimates of personal income in 1999, adjusted to BEA definitions, place the average American Samoan resident's income from all sources at \$4,347². However, when provision is made for imputed rent and subsistence agriculture³, the figure rises by \$1197 to \$5544. The addition of business transfers, net government subsidies, indirect business taxes and capital depreciation completes the transformation to gross national income of \$6332. This latter number corresponds to the lower middle income category defined by the World Bank⁴

Because this is a first attempt, the NIPA team is still gaining experience. The numbers reported here are not as thorough or precise as those of established NIPA statistics divisions. Room for improvement is particularly noticeable, for example, where synthetic estimates/imputation procedures affect measurements for over 69% of interim benchmark final expenditures and 45% of interim benchmark national income. Under these assumptions, this can lead to \$89.1 million of final expenditure uncertainty being identified and thus creating a gray zone roughly 20 percent around the GDP estimate. But this worse case scenario should be tempered by the measured 1999 statistical discrepancy of \$-29.9 million (6.7% of GDP), which compares very favorably with U.S experience (less than 2%).

Recognizing these deficiencies, the team has proposed a series of organizational and statistical initiatives to improve the data sets. The first objective must be, wherever practical, the replacement of synthetic estimates or imputed values with values derived from appropriately designed surveys and censuses. Short-term plans involve initiating three mail-in surveys to firm up the estimates of personal consumption expenditures, and investments in machinery and equipment, and structures. Over the long-term plan initiatives will tackle trade data problems, possibly using a new data capture system with revised customs forms and automated software. Consideration will also be given to creating a true implicit price deflator for calculating constant dollar GDP. This report confirms that continual improvements are expected over the next few years, especially after the benchmark value added estimates become available in late 2004.

¹ The distribution of income should also be analyzed, but reliable data to perform this calculation are not available at this time.

² See Section D1.1.1 page 11. Personal income is estimated to be \$248,885,179; population in 1999 is 57250.

³ See Sections D.1.1.2 (page 14) and D.1.1.3 (page 16) on own consumed subsistence agriculture (income-in-kind) is estimated to be \$29,520,185; imputed rent is estimated to be \$39,059,820. These imputations are worth \$1198 per capita.

⁴ See *World Development Report 2003*, Table 1. pp. 234-5. Per capita gross national income for lower middle-income status, on a PPP adjusted basis, was \$5020 in 2001. A representative sample of countries falling into this category include, inter alia,: Algeria, Bulgaria, Columbia, Dominican Republic, Kazakhstan, and Lebanon. World Bank numbers do not appear to include imputations for rent or subsistence agriculture.

Thus, the machinery has been set in motion for determining the Territory's GDP, plus other relevant and significant economic indicators. Workers have been well-trained, capable leaders hold the reins on developed strategy, and data collections are being fitted to proper assessment tables and methods. With continued adjustments and fine-tuning, the entire NIPA project will be a well-oiled functioning apparatus, producing important information and factors to serve the top levels of government.

B) Introduction

This report serves as the second semi annual report on the status of the NIPA project as mandated by Executive Order 002-2003. The focus of this report is on the final estimates produced and methodologies used as a result of a joint effort between the American Samoa NIPA Task Force and the US Bureau of the Census through its International Program Center under the leadership of Dr. Marc Rubin.

Dr. Marc Rubin conducted two workshops in American Samoa. The first was held in 2002 and the second was held from July 29th to August 7th 2003. The goal of the second workshop was to produce a final set of NIPA estimates and document their strengths and limitations. The workshop lived up to expectations. Goals set in the preliminary agenda were largely met: the team was able to produce more refined estimates of PCE using both the 1995 HIES data 2000 Census data; imputations for subsistence agricultural and rent on owner occupied housing were completed; creation of the tuna import and export trade deflators was successful; and many of the data gaps on the income (factor cost) side of the GDP estimation were removed.

One of the unexpected findings of the workshop, the discovery of substantial unreported operating surplus in the tuna canning industry, came about as a byproduct of balancing the NIPA accounts and deriving measures of real (deflated) growth. This finding has important implications for how general economic activity in American Samoa should be measured.

This report is divided into five main sections: Section D is the Final Estimates of Annual National Income and Product with subsections on data sources, methodological considerations, facts, figures and caveats; Section E discusses choice of measurement techniques; Section F contains issues and concerns of the NIPA project as a whole; Section G outlines Recommendations and finally Section H is the next steps.

C) Progress to Date

The American Samoa NIPA Task Force through the Executive Order 002-2003 has accomplished not just the mandates of the Executive Order but also outside of its scope. Listed below is the progress to date of the NIPA Task Force:

1. **NIPA Task Force:** Executive Order 002-2003 established the first NIPA Task Force, which comprises of an advisory group and a working group. These groups are made of both government agencies and private sector representatives. Progress to date of this work is mainly due to cooperation from these team players.
2. **NIPA Framework:** The Advisory Group in March 2003 adopted the NIPA framework, which mirrors the framework developed by the Bureau of Census which is being accepted internationally when comparing economic growth and development in the United States to that of the other countries. This framework comprises of five main accounts namely: Account 1: National Income and Product Accounts, Account 2: Personal Income and Outlay; Account 3: Government receipts and expenditures; Account 4: Foreign Transactions; Account 5: Gross Saving and Investment.
3. **Adoption of the statistical methodology:** The NIPA Task Force has also adopted the use of the standard statistical methodology outlined in the NIPA Guide. This contains definitions, details and formulae for calculating GDP as well as the other components of NIPA. The advantage of adopting this standard method is that, it follows the statistical standard used throughout the world by data collection agencies hence enhances the credibility of the American Samoa NIPA.
4. **Statistical Act 2003 submitted to the Fono:** The proposed Statistical Act 2003 was approved by the Governor in 2003 and has been submitted to the Fono to be enacted into statute. Once this is approved, then it will be the legal document for all statistical work including NIPA.
5. **Cooperation from government agencies and private sector:** A good networking among stakeholders of the NIPA project has contributed to its progress to date. Since the inception of this project, both government and private sector through their respective representatives have been cooperatively contributed to the data gathering. The importance of this networking is that each one sees that NIPA is a vital part to the overall economic development of the Territory as a whole.
6. **Improve quality of Government statistics:** Throughout the entire NIPA exercise, quality and credibility of the government finance statistics have been vastly improved especially on compensation data, corporate profits,

continuous improvements to the current status on some of the government statistics especially tax information was discovered.

- 7. Office of Insular Areas recommended the American Samoa NIPA framework as the model to be used by other Insular Areas:** The other Insular Areas namely Guam, Saipan and Virgin Islands have recommended to OIA for the use of the American Samoa model to develop their respective models. Staff of the NIPA Task Force is currently working on putting together a chronology of events that the NIPA Task Force took to get to where the NIPA project is at right now.
- 8. Cost saving to the American Samoa Government:** Since the inception of NIPA about a year ago, it has not cost the American Samoa Government additional expenses. However, as time goes by the workload has been increasing which in turn induced the need to establish a separate unit within the Department of Commerce to concentrate on the data gathering and analysis hence, there is a need for assistance from the Government.
- 9. GDP benchmark year 1999:** After numerous attempts, iterations and also close consultation with Dr. Rubin of the Bureau of Census, the NIPA Task Force has developed a GDP for the benchmark year 1999. This will be the referencing date for any future comparisons as nothing of this kind has ever been established before.

D) Final Estimates of Annual National Income and Product

Since the NIPA's are designed to be a self-consistent system, balance between the left and right hand side of each account is a matter of architecture and is assured by definition. As a consequence, when real data are used, especially the savings and investment account, the failure to balance any individual account is a signal that there is error. While the American Samoa NIPA passes this consistency test, this does not ensure measurement accuracy.

Table M1: Summary National Income and Product Account

Line	Factor Costs	2000	1999	Line	Final Expenditures	2000	1999
1	Compensation of employees	195,709,602	193,303,924	36	Personal consumption expenditure (2-3)*	297,712,439	298,677,124
2	Wage and salary accruals	181,130,101	178,629,291	37	Durable goods*	56,307,764	58,801,664
3	Disbursements (2-7)	181,130,101	178,629,291	38	Non-durable goods*	101,240,540	101,115,834
4	Wage accruals less disbursements (3-8 and 5-5)	0	***	39	Services*	69,139,903	70,179,622
5	Supplements to wages and salaries	14,579,501	14,674,633		Imputations*	71,024,232	68,580,021
6	Employer contributions for social insurance (3-16)	10,986,025	10,998,037	40	Gross private domestic investment (5-1)	24,116,139	27,028,423
7	Other labor income (2-8)	3,593,476	3,676,596	41	Fixed investment	22,688,012	26,055,506
				42	Nonresidential	16,865,945	19,326,326
8	Proprietors' income with inventory valuation and capital consumption adjustments (2-9)*	55,534,116	54,656,198	43	Structures	6,651,629	6,457,136
				44	Equipment and software	10,214,316	12,869,190
9	Rental income of persons with capital consumption adjustment (2-10)*	40,327,609	38,766,824	45	Residential	5,822,067	6,729,180
				46	Change in private inventories	1,428,127	972,917
10	Corporate profits with inventory valuation and capital consumption adjustments*	7,534,464	12,579,511				
11	Corporate profits with inventory valuation adjustment			47	Net exports of goods and services*	-32,414,505	-71,557,505
12	Profits before tax*	7,269,737	12,137,524	48	Exports (4-1)	482,069,368	464,307,656
13	Profits tax liability (3-13)	3,393,512	3,497,922	49	Imports (4.3)	514,483,873	535,865,161
14	Profits after tax	3,876,225	8,639,602				
15	Dividends (2-12)	2,991,801	2,376,932	50	Government consumption expenditure and gross investment (3-1 and 5-2)	148,475,438	190,089,844
16	Undistributed profits with inventory valuation and capital consumption adjustment	1,149,151	6,704,657	51	Federal		
17	Inventory valuation adjustment			52	National defense		

Line	Factor Costs	2000	1999	Line	Final Expenditures	2000	1999
18	Capital consumption adjustment			53	Non-defense		
				54	State and local	148,475,438	190,089,844
19	Net interest (2-15)	6,622,499	5,375,214				
20	National income	305,728,290	304,681,671				
21	Business transfer payments	163,710	250,579				
22	To persons (2-19)	163,710	250,579				
23	To the rest of the world (4-8)	0	0				
24	Indirect business tax and non-tax liability (3-14)	6,118,823	14,226,647				
25	Less subsidies less current surplus of government enterprises	-7,307,994	-9,605,320				
26	Consumption of fixed capital (5-7)	29,265,688	33,713,973				
27	Private (5-8)	11,320,184	10,452,258				
28	Government (5-9)	17,945,504	23,261,715				
29	General government (5-10)	***	7,957,371				
30	Government enterprises (5-11)	17,945,504	15,304,344				
31	Gross national income	348,584,505	362,478,190				
32	Less income receipt from the rest of the world (4-2)***	***	***				
33	Plus income payments to the rest of the world (4-4)*	110,294,774	111,610,237				
34	Gross domestic income	458,879,279	474,088,427				
35	Statistical discrepancy (5-13)	-20,989,768	-29,850,541				
	GROSS DOMESTIC PRODUCT	437,889,511	444,237,886		GROSS DOMESTIC PRODUCT	437,889,511	444,237,886

1. **Sources:** American Samoa *Internal Revenue Service/Treasury Tax Returns****, American Samoa *Budgetary Reports****, American Samoa *Import Trade Data- Department of the Treasury, Customs & Excise Tax Division****, U.S. Bureau of the Census *Foreign Trade****, Section D (Pages 8 to 31).

* Denotes an imputation or synthetic estimate

*** Denotes significant uncertainty

D.1) Data Sources and Methodological Considerations

There are several key data sets that have been used extensively in the estimation of GDP. The primary data sources for final expenditure estimates of national product are:

D.1.1) Personal Consumption Expenditures (PCE)

1995 Report of the 1995 Population, Housing and Expenditure Survey (HIES)

2000 Census of Housing and Population

1999 Census of Agriculture

1999-2002 Import Trade Data- Department of the Treasury, Customs & Excise Tax Division

D.1.1.1) Deriving an Estimate of Personal Consumption Expenditures

Since nearly seventy percent of U.S. GDP is composed of Personal Consumption Expenditures (PCE), and high PCE percentages are not atypical for developed and developing countries alike, the importance of PCE cannot be overemphasized in any exercise attempting to compile a complete, current set of NIPA's (National Income and Product Accounts) for American Samoa.

To date, we have found that the calculation of annual PCE requires significant staff time and is anything but routine. Critical pieces of information are lacking. With the exception of the 1995 HIES (Household Income and Expenditure Survey), the data sets at our disposal are not direct measures of personal consumption. Moreover, they are flawed in a variety of ways, and will require artful manipulation to provide a basis for reliable estimation. In this paper, we will discuss a short run strategy for extracting the maximum amount of information from existing data sets. But in the best of all possible worlds, we would obtain reliable information from a survey of retail trade and services. These future resources are already on the drawing boards and will need organizational commitment and funding to get off the ground.

The fundamental problem facing the working group is that our best measure of PCE comes from an old survey (HIES 1995), which has a major reliability issue. Our analysis of the survey results shows that PCE exceeds personal income (PI) by a substantial amount. While it is possible for negative savings to occur in a society at any given point in time, it is an unsustainable state of affairs over the longer run. Our strong suspicion is that the interviewers conducting the survey were not able to get candid answers to the question about total income received (i.e. people systematically underreported their true incomes).

Without a reliable set of figures on total income, it is not possible to calculate the average propensity to consume ($APC = PCE/PDI$ (Personal Disposable Income)) and thus have a credible basis in theoretical economics for extracting/estimating consumption from future income figures. Nevertheless, with a restrictive assumption on the dynamics of per capita PCE, one can still develop a plausible figure. The assumption used here is that per capita

PCE remains constant in real terms. Thus, one can calculate the per capita PCE from the HIES as \$213,135,900 / 53050⁵ which equals \$4018 in 1994 dollars. Using data on the growth of population between 1994 and 2002, plus the growth of prices (CPI) over the same time horizon, we can calculate PCE in the years after the HIES was taken. Based on the above methodology, PCE for January 1, 2000 could be as much as \$256,676,531 in end year 1999 dollars. This figure is part of the total subsistence economy consumption and explicitly includes \$33,915,541⁶. This last figure was imputed to represent consumption (rent) of owner occupied housing in 1999.

Lacking a tool such as the APC (Average Propensity to Consume), another alternative is to try deriving PCE directly from the income figures using the NIPA accounting definitions. All of the necessary major pieces of information are collected by the various government offices in Pago Pago. In 1999, estimated W-2 wages and salaries were: \$178,629,291⁷. Based upon these wage and salary numbers and the NIPA definitions, PI is estimated to be \$320,986,411 including imputations for subsistence agriculture and rental income arising on owner occupied housing. Netting out tax liabilities of \$12,888,134 yields disposable personal income (DPI) of \$303,357,732. The final leg of the journey is the removal of personal savings from DPI.

At present we do not have a reliable estimate of the savings component. Direct measurement can be very complicated, and the U.S. makes no attempt to do so; rather personal savings is calculated as a residual using knowledge of DPI and PCE. This forces us to perform a sensitivity analysis based upon our best guess as to the likely range of the personal savings rate. If no savings are made then PCE is equal to DPI⁸; if savings are equal to 5%⁹ of DPI, then PCE is \$288,189,845; with savings at 10% PCE falls to \$273,021,959.

As an alternative to the W-2 approach, we can employ total Census reported earnings from all sources, \$249,616,889, and adjust to make it compatible with the BEA concept of Personal Income. Review of the Census questionnaire provides guidance for this calculation. More specifically, Census aggregate income *minus* "other labor income" *minus* "dividends received by government" *minus* "interest paid by persons" *minus* "employee social security contributions" roughly equals BEA Personal Income (BEA

⁵ The HIES reports that total household expenditures were an estimated \$203,623,059 in 1994. Of this, an estimated \$18,647,319 was spent on loans and mortgage repayments. Thus identified PCE using BEA definitions was really \$184,975,740. However, when imputation for owner occupied housing consumption (rent) is included, PCE rises by \$28,135,900 to the figure reported in the text. Imputation is based on the assumption that the *average* owner occupied dwelling is nearly identical to the *average* rental unit, and thus the former, if put on the market, would command the same price. The \$28 million results from multiplying 6902 owner occupied units by an average monthly rent of \$340 for 12 months. See pages 11 and 193 in the HIES report.

⁶ Rebasings 1994 prices to 1999 prices boosts the imputed rent from \$28,160,160 to \$31,427,414. Accounting for five years of population growth adds an additional \$2,488,127.

⁷ This compares to a corresponding figure from the 2000 Census of \$194,857,094, but the latter is net of imputed rental income on owner occupied housing.

⁸ Based on American Samoa bank data, net savings, proxied as the difference between total time and NOW account deposits in 1995 and 1996 were perhaps \$ 3,151,733 or 1.56% of DPI.

⁹ Informal analysis of Marshall Islands HIES data suggests that the APS is 5%.

PI).¹⁰ This figure, \$248,885,779, does not include subsistence economy consumption or imputed rental consumption attributed to owner occupied housing. Netting out tax liabilities and savings from this “BEA defined PI” produces imputation free estimates of PCE ranging from \$212,397,341 (10% savings rate) to \$224,197,193 (5% savings rate) to \$235,997,045 (0% savings rate)¹¹.

If one were forced to pick a value for PCE rather than present a range, preference for a figure midway between the \$224.2 and \$236.1 million estimates seems reasonable. Anecdotal information from American Samoa banking records and the preliminary analysis of Marshall Island data suggests that the savings rate is somewhere between 0% and 5%. Finally, if the endpoints of the range are augmented by an estimated \$29.5 million in informal economy/subsistence consumption and an additional \$39 million in imputed rent, this would suggest a PCE figure between \$292.7 and \$304.6 million (\$298.7).

D.1.1.2) Measuring Constant Dollar Personal Consumption Expenditures Using HIES

One method for developing an estimate of PCE beyond the base year 2000 (January 1), is to extrapolate 1995 HIES per capita consumption using population growth and price inflation as measured by the American Samoa CPI. Here we report the spreadsheet values used in the calculation.

Table D1.1.2 PCE (\$1999, HIES Based)

Population	Mid-year	End Year Pop			
1994	52800	53050			
1995	53300	53700			
1996	54100	54550			
1997	55000	55400			
1998	55800	56300			
1999	56800	57250			
2000	57700	58550			
2001	59400	60200			
2002	61000	61800			
1994 End Year HIES Personal Consumption	213135900				
Consumption Per Capita	4017.64				
1997 PCE (\$1994=100)	222577358				
1997 PCE (\$1997=100)	243035402				

¹⁰ We say “roughly equals” since it is unlikely that the Census data captures both proprietor’s income and rental income *with* allowance for capital consumption and inventory valuation adjustment. Refer to Table M2 (page 38) lines: 8 and 21 for items used in adjusting the Census figure to the BEA definition.

¹¹ If 1999 PCE without imputation for subsistence agriculture or owner occupied rent is \$223.9 million, then the services component, at 30.5%, is roughly \$68.5 million

Population	Mid-year	End Year Pop			
1994 End Year CPI	144.7				
1995 End Year CPI	149.7				
1996 End Year CPI	153.8				
1997 End Year CPI	158.0	100.9			
Rebasing of 1994 prices in 1997 dollars	1.092				
1998 End Year CPI		102.2			
			PCE Using 1994 Per Capita & Pop Growth	PCE Using Rebased 1997 Prices	PCE Using Rebased 1999 Prices
1999 End Year CPI		102.2	230009996	251151205	256676531
2000 End Year CPI		105.2	235232930	256854202	262504994
2001 End Year CPI		106.5	241862039	264092621	269902658
2002 End Year CPI		108.6	245076153	267602157	273489404

Source: Report of the 1995 Population, Housing and Expenditure Survey

The implicit spreadsheet above takes per capita consumption of \$4018 in 1994 and multiplies this value by 55,400 to arrive at the 1997 PCE estimate of \$222,577,358 in 1994 end year prices. This figure is rebased in 1997 dollars yielding \$243,035,402. The same technique, adjusted for population growth, yields \$256,676,531 in 1999 end year PCE valued in 1999 end year prices.

We applied the same techniques to derive the estimate of per capita consumption attributable to the subsistence economy. Based upon the 1999 Agricultural Census, we calculate that this consumption was \$29,520,185 at years end 1999.

Table D1.1.2 Subsistence Consumption (\$1999=100)

Population	Mid-year	End Year Pop
1994	52,800	53,050
1995	53,300	53,700
1996	54,100	54,550
1997	55,000	55,400
1998	55,800	56,300
1999	56,800	57,250
2000	57,700	58,550
2001	59,400	60,200
2002	61,000	61,800
1999 End Year Subsistence Personal Consumption	29,520,185.00	
Consumption Per Capita	515.64	
1999	29,520,185.00	

Population	Mid-year	End Year Pop
2000	30,190,512.34	
2001	31,041,312.44	
2002	31,866,330.71	

Source: 1999 Census of Agriculture- American Samoa.

D.1.1.3. Derivation of Imputed Rent in the Post-Censal Years

The table below is a sampling from the entries in the LUP (Land Use Permit) data base. When all new construction is summed, the amount of new gross area added to the housing stock is estimated to be 438,496 square feet. If the average new house has 1200 square feet of useful living space, this converts to 365 new home equivalents.

Table D4.1 Sample Costs in LUP

IDNO	LandOwn	LandUse	PropAct	Cost	Footprint Size	Gross Area	Height
000808L	Communal	Residential	Extension	200	24x21	504	9
000830L	Communal	Residential	Extension	300	16x44	352	8
000633L	Communal	Residential	Extension	1000	30x20	600	9
000423L	Communal	Residential	Extension	1500	16x42	672	10
000631L	Communal	Residential	Extension	1500	20x12	240	8
000032L	Communal	Residential	Extension	3000	20x24	480	8
000340L	Communal	Residential	Extension	3000	16x38	608	9
000522L	Communal	Residential	Extension	3000	20x18	360	15
000034LVB	Communal	Residential	Extension	5000	30x15	450	8
000126L	Communal	Residential	Extension	5000	10x40	400	8
000148L	Communal	Residential	Extension	5000	58x30	1740	8
000246L	Communal	Residential	Extension	5000	24x12	288	8
000261L	Communal	Residential	Extension	5000	16x20	320	
000288L	Communal	Residential	Extension	5000		720	
000539L	Communal	Residential	Extension	5000	42x10	420	8
000679L	Communal	Residential	Extension	5000	40x22	880	8
000086L	Communal	Residential	Extension	5500	48x34	1632	10
000529L	Communal	Residential	Extension	5800	30x14	430	10
000023L	Communal	Residential	Extension	6000	33x17	561	8
000795L	Communal	Residential	Extension	6500	30x14	420	8
000010L	Communal	Residential	Extension	7500	18x15	270	10
000258L	Communal	Residential	Extension	7500	18x22	396	9
000429L	Communal	Residential	Extension	7500	20x12	240	10
000541L	Communal	Residential	Extension	7500	67x20	1340	8
000787L	Communal	Residential	Extension	7500	20x12	240	9
000516L	Communal	Residential	Extension	8000	18x10	180	8
000789L	Communal	Residential	Extension	8000	15x40	600	8
000132L	Communal	Residential	Extension	8500	16x44	704	8
000666L	Communal	Residential	Extension	8500	66x69	4554	8

Source: American Samoa Land Use Permit Data Base***

If rent is fixed at \$405 per month and there are 365 new units, then \$1,773,900 in additional imputed rent would have to be added to the base figure of \$39,059,820. If, on the other hand, one assumes the intercensal growth rate of 310 units per annum, the increment in imputed rent over and above the base falls to \$1,506,600.

Table D4.2 Imputed Rent

	Housing Units	Monthly Rent	Imputed Rent	
Owner Occupied 1999	7219	405	35084340	
Rent Free 1999	818	405	3975480	
			39059820	
	Housing Units	Imputed Rent	Housing Units	Imputed Rent
2000 New Houses	365	1773900	310	1506600
2001 New Houses	365	1773900	310	1506600
2002 New Houses	365	1773900	310	1506600

Source: 2000 Census of Population and Housing-American Samoa

D.1.1.4) Personal Consumption of Services, Durables and Non-Durables

The NIPA accounts break down personal consumption expenditures into services, durable goods and non-durable goods. Current American Samoa data sets do not provide direct estimates of purchased services. Customs data are not designed to capture this information since its focus is on merchandise imports. Both the Economic Census and the Survey of Retail Trade and Services, which do bear directly on these expenditures, will be available in late 2004. For the present, the best that can be done is to identify service expenditures in the 1995 HIES and calculate its percentage of PCE (personal consumption expenditure). In 1994, \$184, 975,740 was spent on PCE. The table below identifies \$56,473,164 in purchased services. Thus, services are 30.5% of total PCE; pending the receipt of better data sets, this percent will be used to disaggregate PCE entries in the relevant NIPA tables.

Table D.1.1.4 1995 HIES SERVICES	
	Amount
Housing	3,791,497.00
Rent	3,412,781.00
Insurance	378,716.00
Utility costs	21,095,505.00
Electricity	7,692,110.00
Water	3,462,576.00
Telephone	7,378,363.00
Gas/Kerosene	2,562,456.00
Membership fees	809,011.00

Social clubs	255,242.00
Table D.1.1.4 1995 HIES SERVICES continued	
	Amount
Sporting clubs	89,856.00
Credit cards	282,074.00
Others	181,839.00
Overseas remittances	4,405,424
Local remittances	1,264,806
Church-related expenses	13,917,914
Major Household Expenditures in Last Year by Type: 1995	
Health/Insurance	1,989,770
Out-patient visits	477,162
Medicines	356,637
Health insurance	168,995
Life insurance	986,976
Off-island Travel	3,717,880
Airfare	2,424,474
Accommodations	445,073
Other	848,333
Credit Cards	53,487
Others	199,144
Legal/accounting fees	33,150
Housekeeping service	35,911
Babysitting/care of aged	41,995
Moving, storage, freight	21,528
Alimony	0
Child support	66,560
All Fares	683,136
Fare-ground transportation	374,541
Bus	342,327
Taxi	26,692
Other road transport	5,522
Fare-air air transportation	265,029
Airfare to Apia	142,309

Airfare to Manu'a	0
D.1.1.4 Major Household Expenditures in Last Year by Type: 1995 continue...	
Airfare to U.S	0
Air fare to other places	122,720
Fare-water transportation	43,566
Boat fare to Apia	0
Boat fare to Manu'a	0
Boat fare to other places	43,566
Motoring	225,880
Repair	49,088
Motor tune-up	33,549
Lubrication services	1,227
Vacuuming and cleaning	1,457
Other & unspecified motor	140,559
All services	4,068,346
Haircut	3,068
Beauty parlor	14,113
Laundromat	247,646
Laundry/dry cleaning	83,155
Telegrams	3,866
Postage, etc	7,274
Dress making, tailoring	16,874
Electrical appliances	77,774
Lawnmower, etc	2,746
Other	20,632
Legal fees, etc.	850,756
Fines	70,564
Unspecified	2,669,878
Admissions	226,514
Movie	19,635
Nightclub/dance	0
Arcade games	0
Juke box	0

Others	206,878
D.1.1.4 Major Household Expenditures in Last Year by Type: 1995 continue...	
Sports admissions	24,851
Boxing	
Others	24,851
TOTAL SERVICES FROM THE 1995 HIES	56,473,164

Source: Report of the 1995 Population, Housing and Expenditure Survey

The disaggregation for services in 1999 begins with the reported \$298,677,124 in PCE. Subtracting imputed rent and subsistence agriculture leaves \$230,097,119 an amount, which represents the base for calculating the consumption of services component. Since, the latter are fixed by assumption at 30.5%, purchased services might be as much as \$70,179,624. In 2000, PCE is estimated to be \$297,712,439 of which \$71,024,232 are imputations and \$69,139,903 are purchased services.

The disaggregation exercise is completed by breaking down PCE into durable and non-durable goods. Based upon the data in Section D.1.4 on page 18, durable goods as a percent of all imports are 0.368 in 1999 and 0.357 in 2000. With PCE net of imputations and services, durable purchases might be \$57.2 million in 1999 and \$54.9 million in 2000.

D.1.2) Gross Private Domestic Investment (I)

Land Use Permit Data Base

Import Trade Data- Department of the Treasury, Customs & Excise Tax Division

ASG Budgetary Reports

D.1.2.1) Investment

Final expenditures on investment are composed of both private and government components in the NIPA accounts. To arrive at the final estimate of total spending on investment, summary entries in the two tables must be added together; augmented by investment in inventories and converted to constant dollars. Within the American Samoa private sector, the following major categories are identified:

Table D.1.2.1 Gross Private Fixed Investment (nominal \$)

	1999	2000
Private Fixed Investment	26,055,507	22,307,951
Nonresidential	19,326,327	16,590,681
Structures	6,457,136	6,531,900
Nonresidential buildings, including farm	6,431,100	6,520,900
Other structures	26,036	11,000
Equipment and software	12,869,191	10,058,781
Information processing equipment/software	886,649	465,249

Computers and peripheral equipment (1)	572,976	220,439
Table D.1.2.1 Gross Private Fixed Investment (nominal \$) continued		
Software (2)	0	0
Other	313,673	244,810
Industrial equipment	5,730,203	4,647,755
Transportation equipment	3,123,575	2,912,253
Other	2,242,115	1,568,275
	1999	2000
Residential	6,729,180	5,717,270
Structures	6,729,180	5,717,270
Single family	6,024,620	5,111,300
Other structures	704,560	605,970

Sources: American Samoa Budgetary Reports, American Samoa Import Trade Data- Department of the Treasury, Customs & Excise Tax Division, American Samoa Land Use Permit Data Base.

Table M1.2 Gross Private Fixed Investment (\$1999=100)¹²

	1999	2000
Private Fixed Investment	26,055,506	22,688,012
Nonresidential	19,326,326	16,865,945
<i>Structures</i>	6,457,136	6,651,629
Nonresidential buildings, including farm	6,431,100	6,640,428
Utilities	0	0
Mining exploration, shafts, and wells	0	0
Other structures	26,036	11,202
<i>Equipment and software</i>	12,869,190	10,214,316
Information processing equipment and software	886,649	555,749
Computers and peripheral equipment (1)	572,976	263,319
Software (2)	0	0
Other	313,673	292,431
Industrial equipment	5,730,203	4,659,000
Transportation equipment	3,123,575	2,871,749
Other	2,242,115	1,572,069
Residential	6,729,180	5,822,067
<i>Structures</i>	6,729,180	5,822,067
Single family	6,024,620	5,204,990
Multifamily	0	0
Other structures	704,560	617,077

Sources: American Samoa Budgetary Reports, American Samoa Import Trade Data- Department of the Treasury, Customs & Excise Tax Division, American Samoa Land Use Permit Data Base.

¹² Investments in structures for 2001 and 2002 were imputed using the 2000 numbers as the base and the growth in deflated construction materials and wages as the scaling factor.

Within the American Samoa government sector, the following major categories are identified:

Table M1.3 Gross Government Fixed Investment (nominal \$)

	1999	2000
Gross Government Fixed Investment	60,213,551	30,773,486
Structures	33,644,328	19,651,201
Equipment and software	700,846	813,262
Capital Outlays	25,868,377	10,309,023

Sources: American Samoa Budgetary Reports, American Samoa Import Trade Data- Department of the Treasury, Customs & Excise Tax Division, American Samoa Land Use Permit Data Base.

Table M1.4 Gross Government Fixed Investment (\$1999 =100)

	1999	2000
Gross Government Fixed Investment	60,213,551	31,316,829
Structures	33,644,328	20,011,406
Equipment and software	700,846	97,1458.17
Capital Outlays	25,868,377	10,333,964

Sources: American Samoa Budgetary Reports, American Samoa Import Trade Data- Department of the Treasury, Customs & Excise Tax Division, American Samoa Land Use Permit Data Base.

Tax records identify private inventory investment as being worth \$1,428,127 in 2000 and \$972,917 in 1999. When these amounts are added to the other investment figures cited above, total investment is captured:

Table M1.5 Total Investment (\$1999 = 100)

	1999	2000
Private Fixed Investment	26,055,506	22,688,012
Gross Government Fixed Investment	60,213,551	31,316,829
Change in Private Inventories	972,917	1,428,417
Total Investment	87,241,974	55,433,258

Sources: American Samoa Budgetary Reports, American Samoa Import Trade Data- Department of the Treasury, Customs & Excise Tax Division, American Samoa Land Use Permit Data Base.

D.1.2.2) Investment in Construction: Synthetic Index Based on Deflation of Construction Materials and Construction Wages

One method for creating a measure of investment in structures is to equate investment value with the monetary value of the labor and materials inputs appropriately scaled. Precedence for this approach can be found in the United Nations SNA (System of National Accounts) manual; it is what the RMI (Republic of the Marshall Islands) did when they took their construction survey back in 1991/92. RMI analysts found that labor and materials typically account for 75% of a construction project's value. We utilize this scaling factor, information from Customs on building materials imports, data on wages from Tax Office; and price deflators from the PPI indices to create a series on deflated construction investment.

Table D.1.2.2 Investment in Structures

	2000	1999
Building materials	8,827,758.75	3,383,475.00
	0.97	1.00
	9,095,266.59	3,383,475.00
Cement	1,049,311.25	355,892.50
	1.00	1.00
	1,052,806.62	355,892.50
Electrical goods	6,018,180.00	6,338,643.75
	0.99	1.00
	6,018,180.99	6,338,644.75
Lumber, treated	2,021,988.75	2,774,545.00
	0.97	1.00
	2,083,261.14	2,774,545.00
Lumber, untreated	56,708.75	73,080.00
	0.97	1.00
	58,427.20	73,080.00
Masonite	39,908.75	116,597.50
	1.03	1.00
	38,757.05	116,597.50
Paints	676,347.50	1,259,032.50
	1.02	1.00
	659,903.99	1,259,032.50
Panel boards	0.00	336,060.00
	1.03	1.00
	0.00	336,060.00
Plywood	772,988.75	1,144,791.25
	0.89	1.00
	865,198.07	1,144,791.25
Roofing irons	9,697.50	0.00
	1.02	1.00
	9,481.26	0.00
Roofing mat., corrugated	242,912.50	162,505.00
	1.02	1.00
	237,495.93	162,505.00
Roofing mat., felt	5,616.25	3,696.25
	1.02	1.00
	5,498.01	3,696.25
Roofing mat., rolls	21,698.75	85,580.00

	2000	1999
	1.02	1.00
	21,241.93	85,580.00
Roofing mat., shakes	0.00	25,782.50
	1.02	1.00
	0.00	25,782.50
Roofing mat., shingles	0.00	69,863.75
	1.02	1.00
	0.00	69,863.75
Roofing mat., others	15,067.50	299,988.75
	1.00	1.00
	14,999.17	299,988.75
Tools	913,597.50	1,487,811.25
	1.03	1.00
	891,131.99	1,487,811.25
Wire articles	262,156.25	1,214,518.75
	1.00	1.00
	263,366.20	1,214,518.75
TOTAL DEFLATED VALUES	21,315,016.14	19,131,864.75
Wages	9,379,094	8,418,458
Labor and Material Values	30,694,110.14	27,550,322.27
Deflated Value of Construction	40,925,480.19	36,733,763.02

Sources: American Samoa Import Trade Data- Department of the Treasury, Customs & Excise Tax Division, American Samoa Land Use Permit Data Base.

The above synthetic calculations probably overstate the true investment in structures since there is no direct or obvious way to remove, repair and maintenance expenditures from these numbers. By way of comparison, examination of the LUP (land use permit data base) identifies \$30,356,575 in total construction activity in 2000. This suggests that the LUP/and or the algorithm to estimate construction activity is incomplete or wrong.

Moreover, when the LUP database is queried for “new construction” only, the value drops to \$12,473,696. This estimate is even farther below the \$40.9 million recorded in the table, and the difference must be addressed. It may be the absence of Government investment in structures in the LUP that causes the discrepancy. If Government budget expenditures on structures are added to the LUP figure, the new total comes to 32,124,897. This is still some 20% short of the synthetic estimate, but in the ballpark. Clearly, more work needs to be done on this issue. At best, the growth rate in material purchases, as opposed to their absolute level, can be used to proxy changes in overall construction investment activity.

D.1.3) Government Expenditures (G)
ASG Budgetary Reports

The information in the tables below is used to generate the government component of GDP measured as final expenditures.

Table D1.3.1 Government Expenditures (nominal \$)

	1999	2000
Government Consumption Expenditures and Gross Investment	190,089,844	151,344,017
Consumption Expenditures	129,876,293	120,570,531
Non-durable Goods	16,180,057	7,722,277
Services	113,696,236	112,848,254
Compensation of general government employees	85,255,230	90,620,913
Consumption of general government fixed capital	7,957,371	853,397
Other services	20,483,635	21,373,944
Gross Investment	60,213,551	30,773,486
Structures	33,644,328	19,651,201
Equipment and software	700,846	813,262
Capital Outlays	25,868,377	10,309,023

Sources: *American Samoa Budgetary Report, American Samoa Import Trade Data- Department of the Treasury, Customs & Excise Tax Division*

Deflation to constant dollars is based on the application of two different price indices: the CPI (consumer price index) is used for non-durable goods, employee compensation and other services; the PPI for machinery and equipment is used for consumption of fixed capital¹³.

Table D.1.3.2 Government Consumption Expenditures (\$1999 = 100)

	1999	2000
Government Consumption Expenditures	129,876,293	117,158,609
Non-durable Goods	16,180,057	7,502,060
Services	113,696,236	109,656,549
Compensation of general government employees	85,255,230	88,036,666
Consumption of general government fixed capital	7,957,371	855,462
Other services	20,483,635	20,764,421

Sources: *American Samoa Budgetary Report, American Samoa Import Trade Data- Department of the Treasury, Customs & Excise Tax Division*

¹³ When appropriate data on wage costs become available, the CPI will be replaced in the deflation of employee compensation.

D.1.4 Net Exports (X-M)

Import Trade Data- Department of the Treasury, Customs & Excise Tax Division
Cannery Reports
U.S. Government trade documents

D.1.4.1 Procedures for Adjusting Imports

The August 2003 workshop raised significant questions about the reliability of the trade data collected by the government's Customs division. On a line-item-by-line-item basis, the annual variation in the constant dollar volume of commodity imports often exceeded 50%. Common sense could not validate such volatility: by definition, seasonality could not be present in annual data, and most of the goods in question were not one time purchases that would be inventoried for sale in subsequent years. The NIPA team believed that some of the discrepancies could be attributed to the level of disaggregation in the data. That is, year-to-year fluctuations in specific commodity flows were unduly amplified by separating similar commodities into discrete, overly narrow categories. Coding errors and data entry were also implicated in suspicious data values.

Because of the central role played by trade data in the calculation of real GDP, its subcomponents and their respective growth rates, the NIPA team agreed to conduct a thorough review of the data sets and make appropriate revisions. In the first phase, American Samoa staff verified all of the data entries off of the original custom's documents. After correcting for keying errors, product categories were consolidated thereby reducing the number of line items from 252 to 112.

In the second phase, Rubin applied a series of judgmental algorithms¹⁴ to detect outliers in the provisional data sets, and then imputed replacement values to remove detected time series volatility. The goal was to create a net export profile, which exhibited patterns more consistent with known changes in income and other economic aggregates.

Based on his experience with other foreign trade data, Rubin ultimately decided that a specific data point was a candidate outlier if its magnitude was less than 50% of the maximum value in the specific item's import series over the period of observation 1999-2002^{15, 16}. Candidates, which passed through this first filter, were further screened for dollar significance: items with import values less than \$1,000,000 were dropped from consideration¹⁷. Imputation followed detection.

¹⁴ The number of data points were too few to apply standard time series methods for detecting outliers.

¹⁵ At 25%, tin plate is an exception to this 50% rule of thumb. However, its dollar volume is so large reaching more than \$70 million –or 30% of imports in some years, that rigidly applying the filter would lead to the retention of implausible volatility in the trade numbers.

¹⁶ While this might seem to impart an upward bias to the imputed trade figures by implicitly assuming the low value is the outlier, experience with actual American Samoa trade data validates this assumption. In general, there is an incentive to underreport imports since payment of customs fees depends on the value of declared imports. Though we don't know that this is the actual or only reason why declared imports of landed fish were less than the figures reported by the canneries in their annual financial documents, the understatement is sufficiently large to merit further investigation of what appear to be "low ball" numbers.

¹⁷ One million dollars is roughly one half of one percent of total import trade.

As a general strategy, Rubin first attempted to impute using conceptually related data sets rather than mechanically apply some standard statistical smoothing technique. For most of the personal consumption items in the trade data set, the HIES (Household Income and Expenditure Survey) contained budget information on household purchases of similar items in 1994. Rubin converted estimated item purchases in the HIES into item budget shares which were then applied to estimated 1999 aggregate personal consumption expenditures. This calculation produced a benchmark consumption estimate for judging the plausibility of the 1999 trade data figures. If the consumption data extrapolated from the HIES were consistent with the trade data, then the preferred method for removing volatility in the latter, as long as it was trending upward gradually, was to apply the population growth rate to the 1999 “HIES” figures. This technique produced proxies in the years 2000-2002¹⁸ for the following commodities: beverages n.e.c., fruit juices, meat, soup, shoes, wearing apparel. If the item in question had a trade value significantly below the implied HIES and it could not have been home produced, the “HIES” benchmark for 1999 was accepted: building materials fell into this category.

If the HIES extrapolated benchmark was significantly less than the associated trade figure, then the latter was usually accepted under the theory that official trade figures have shown a tendency towards being underreported (see footnote 18), and their acceptance places a lower bound on the true personal consumption value. As in the first instance, the population growth rate was then applied selectively to scale up any remaining outlier observations in the years 2000-2002. In those cases where the trade data were not trending upward gradually,¹⁹ population growth rate scaling was rejected. Typically, some simple average of the two or three largest data points was computed and assigned to the outlier observations in question: alcohol and medicinal preparations; kitchen utensils, crockery & cutlery; toiletry articles; cement.

There were three notable exceptions to the application of the above methods: buttons, beads, twines, fibers & embroidery; cloth; poultry, game, all. In the first instance, there were no HIES budget data, and accepting the maximum trade value didn't seem credible. “Button” imports in 1999 of \$945,427 were 5 to 20 greater than entries in successive years. Thus the average value for the years 2000-2002 was used to scale down the high outlier. For cloth, the trade values were much greater than the HIES extrapolation. It was assumed that the trade figures represented personal as well as cottage industry consumption. With no evidence of a significant change in sewing boutique employment, it was felt that the maximum value- \$3,045,575, was more likely to be representative of the trade series in each of the 4 years than any other possible imputation. Finally, for poultry, imports fell far short of HIES extrapolated consumption. This clearly didn't prove that imports were understated since many households raise their own chickens. Rather than impute using the HIES, we accepted the trade figures.

¹⁸ The rationale behind this procedure for calculating the benchmark and its growth is to preserve constant dollar per capita consumption. It is analogous to the methods used for estimating personal consumption expenditures discussed elsewhere in this report (see: Section D.1.1.1 page 12).

¹⁹ For instance, cases where trade rose after the first year and then fell in the fourth, or rose dramatically after the first year and then flattened out.

Not all of the trade outliers were personal consumption items: some commodities were dual use or strictly commercial/government purchases. Dual use items needing adjustment included: cooking oil and unleaded gasoline. With respect to cooking oil, imputation proceeded in two steps: first, household purchases were isolated using the budget shares in the HIES and population growth; second, HIES estimated household purchases were subtracted from overall oil imports. The remainder, presumed to be cannery consumption, was then analyzed for outliers and adjusted using information on the volume of fish imports. Estimated cannery oil imports in 1999 and 2000 were 32% and 54% respectively of the maximum oil import value. To impute replacement values, it was assumed that the volume of oil imports in constant dollars would be proportional to the volume of fish imports in constant dollars because packaging and cooking requirements are driven by and geometric and physical properties²⁰.

Regarding dual use sales of unleaded gasoline sales, imputation also followed a two-step procedure. Based upon the HIES and population growth, we estimated that personal consumption was \$1,918,833 in 1999. In that same year total recorded gasoline imports were 2.7187 times greater than personal consumption or \$5,216,760. Lacking further information, we imposed this proportional utilization factor on the structure of demand and assumed it was constant for the years after 1999. Beyond 1999, household consumption was driven by the increase in population.

In the second stage, imputation for non-household purchases was addressed. Since gasoline imports appeared to be abnormally low in the years after 1999, falling inexplicably by over 63%, replacement was deemed essential. Again, purchases were assumed to be proportional to some proxy for overall economic activity, in this case population growth²¹. These decision rules produce estimated total real gasoline imports rising from \$5,216,760 in 1999 to \$5,631,013 in 2002.

Items considered strictly commercial/ASG included: tin plate, landed fish, fish bait, and diesel fuel. Lacking an HIES or input-output table, imputations for these items were of a more ad hoc nature.

The constant dollar volume of tin plate imports in 2002 dropped off by 25% while the corresponding constant dollar volume of fish imports fell by only 6%. This variation in tin plate imports was considered improbable given the size of the catch and the geometric properties relating area of tin plate to canning volume. Utilizing the fact the ratio of tin

²⁰ Cannery reports place the value of tuna imports at: \$255.8 million (2002), \$271.2 million (2001), \$230 million (2000) and \$241.6 million (1999). The implied volume variations using 2001 as the base are: 0.943 (2002), 1 (2001), 0.848 (2000) and 0.891 (1999). If estimated cooking oil imports were \$3,449,684 in 2001 then 1999 imports might have been \$3,073,146 based on the volume scale factor.

²¹ Vehicle registrations are an obvious proxy for gasoline consumption. The most recent data on the total number of vehicles registered covers the years 1990-2000, and grows from 4911 to 7314 or at 3.69% per annum. From 1999-2002, population increases by 2.58% per year. Since the latter growth rate is affecting more than 36% of total imports, and because the population growth rate is calculated over a more recent period of observation, it is used for the imputation.

imports to fish imports in constant dollar terms was virtually fixed over the period 1999-2001, we calculated the average ratio over that 3 year period and used it to scale 2002 fish imports. With fish imports of \$255.8 million and a scaling ratio of 0.2115, imputed tin imports were estimated to be \$54.1 million.

Without more information, it is difficult to impute landed fish and fish bait imports. At best, we observe that the reported size of the landed catch, in tons, was fairly constant over the years 1998-2000. Thus we substituted the landed average dollar catch for the years 2000-2001- \$19,281,752, for the outlier observation in 1999. For fish baits, we assumed that the average value of the imports in the non-outlier years, 2000-2001, carried over to the years needing imputation. This produced an estimated \$2,313,965 in constant dollar imports for the years, 2002 and 1999.

The final import commodity needing imputation was diesel fuel. The values of these imports in the years after 1999 were all suspiciously low. Related information on utility fuel consumption, truck registrations, ocean vessel arrivals and departures, and tonnage of freight moving on ocean vessels exhibited no such downward trend. Without more data, we accepted the high value observation in 1999- \$37,684,643, as representative for the entire series.

Table D.1.4.1 Import Trade with Adjustments (\$1999=100, f.o.b)

	2002	2001	2000	1999
Total	265,930,621	251,112,605	235,248,707	235,436,953
<i>PCE Food</i>	<i>40,229,118</i>	<i>41,617,638</i>	<i>39,419,012</i>	<i>39,116,487</i>
Food	40,738,437	42,144,536	39,918,074	39,611,719
<i>Other Food</i>	230,479	326,484	121,183	803,719
Regular Foods	40,507,958	41,818,052	39,796,891	38,808,000
Baking powder	58,434	17,459	31,114	73,038
Banana, all	24,040	53,983	65,135	16,572
Beverages, n.e.c.	3,389,451	3,304,203	3,221,098	3,140,084
Butter, all	314,434	170,952	177,271	233,101
Candies & sweets	1,222,829	1,305,211	771,697	1,076,107
Cereal/wheat/bran/oat & other	530,035	430,960	390,690	929,953
Cheese, all	290,673	302,347	431,207	289,700
Chicken, canned	67,435	70,739	76,013	72,217
Cocoa	110,004	71,367	57,433	91,175
Coffee	517,031	281,541	342,407	293,561
Cookies & crackers	1,902,524	2,376,724	2,794,180	2,180,778
Egg, all	467,431	427,098	565,219	398,038
Fish, canned	1,029,244	875,726	1,406,292	1,252,171
Fish, fresh	137,830	121,708	95,734	55,643
Fish, frozen	2,591,128	5,964,431	3,344,571	4,027,164
Flour, all	535,060	625,058	705,759	649,845
Fruit	701,559	1,041,580	1,084,571	810,052
Fruit, juices	1,018,346	992,734	967,765	943,425
Ice cream	744,078	510,309	437,320	582,452
Jams & preserves	95,370	106,507	92,826	131,361
Keg beef	209,782	293,867	514,417	258,457
Mayonnaise	305,610	199,302	336,301	327,166
Meat, canned	2,131,936	1,524,219	1,923,980	1,654,430
Meats, fresh,frozen	7,294,166	7,110,709	6,931,867	6,757,523
Meat, salt	186,076	125,826	158,358	204,036
Milk, all	2,861,311	3,224,333	3,068,221	2,175,483
Mutton, all	291,005	92,443	450,828	570,672
Oil, cooking	1,034,761	1,008,736	983,365	958,632
Onions, fresh	37,157	69,671	102,742	62,459
Pepper & spices	343,205	294,215	317,871	192,861
Pork, frozen	166,603	145,495	156,033	180,333
Potatoes fresh	175,356	239,088	305,169	244,029
Poultry & game, all	3,393,334	1,681,466	1,195,227	1,562,423
Rice	1,151,707	1,296,330	1,408,929	946,038

<i>Continued.....</i>	2002	2001	2000	1999
Salad dressing	155,084	95,022	81,411	110,880
Salt	473,317	755,149	524,172	672,097
Sausage, canned	259,012	219,721	81,730	162,069
Sausage, frozen	252,870	344,390	541,527	419,562
Shellfish, frozen/fresh/canned	141,396	117,603	127,747	141,914
Soup, assorted	1,103,981	1,245,627	1,132,501	1,281,567
Soy sauce	217,608	294,427	433,467	551,965
Sugar	697,088	713,721	528,808	512,162
Ta'amu	29,487	47,505	67,326	80,145
Taros	508,544	339,764	256,125	152,403
Tea	8,938	11,027	4,863	8,843
Vegetables & pickles, canned	375,777	414,918	434,724	443,609
Vegetables, fresh/frozen	565,854	660,692	525,671	538,096
Vegetable juices/broth/sauce	231,425	133,855	102,439	298,462
Walnuts & peanuts	158,631	68,292	42,768	93,248
Fuel and Oil	49,048,381	48,469,256	48,899,078	49,033,974
<i>PCE Fuel and Oil</i>	<i>16,453,774</i>	<i>16,376,545</i>	<i>16,410,784</i>	<i>16,332,233</i>
Butane, gas/other	554,014	412,810	393,575	507,799
Diesel fuel	37,684,643	37,684,643	37,684,643	37,684,643
Unleaded/Gasoline/Motor, gals	5,631,013	5,489,387	5,351,323	5,216,760
Gasoline, aviation/Jet A-1 Fuel	4,578,721	4,208,325	4,545,609	4,892,805
Oil, lubricating	599,990	674,091	923,928	731,967
Textile and Clothing	7,025,220	6,815,331	6,848,336	6,711,186
<i>PCE Textile and Clothing</i>	<i>4,314,659</i>	<i>4,104,770</i>	<i>4,137,774</i>	<i>4,000,624</i>
Buttons, beads, twines, fibers & embroidery	173,240	59,087	185,419	139,249
Cloth	3,045,575	3,045,575	3,045,575	3,045,575
All Shoes	744,052	725,338	707,095	689,311
Wearing Apparel	3,062,353	2,985,331	2,910,247	2,837,051
Jewelry and Watches	302,928	375,936	329,624	246,680
<i>PCE Jewelry and Watches</i>	<i>302,928</i>	<i>375,936</i>	<i>329,624</i>	<i>246,680</i>
Jewelry	176,072	79,191	185,355	137,410

<i>Continued.....</i>	2002	2001	2000	1999
Watches & clocks	126,856	296,745	144,269	109,270
Machinery and Parts	21,148,773	24,541,259	18,470,084	19,713,496
<i>PCE Machinery and Parts</i>	<i>9,205,790</i>	<i>11,640,528</i>	<i>10,599,450</i>	<i>11,058,393</i>
Aircraft, all	29,198	31,696	90,642	490,586
Machinery, all	2,693,789	3,545,660	3,727,200	4,584,162
Motor vehicles, all	10,829,138	13,663,706	12,129,252	12,645,821
Motorcycles & parts	3,722	432	150,608	24,904
Ship parts	7,592,927	7,299,766	2,372,382	1,968,023
Miscellaneous	125,292,708	105,919,924	100,765,213	97,788,090
<i>PCE Miscellaneous</i>	<i>28,383,479</i>	<i>19,032,050</i>	<i>17,488,197</i>	<i>18,694,855</i>
Air conditioning & parts	697,427	238,791	309,925	499,400
Alcohol & medicinal preparation	1,567,700	1,907,014	1,631,295	1,677,182
Athletic goods	778,562	221,202	205,848	527,333
Bags	306,292	0	0	0
Bags & baskets	122,154	155,370	129,468	157,979
Bicycles & parts	49,514	37,268	48,413	50,589
Currency	9,832,045	0	0	0
Fish bait, frozen	2,313,966	1,814,834	2,813,098	2,313,966
Fish, landed	30,851,138	20,360,070	18,203,435	19,281,752
Furniture	1,227,625	891,285	938,419	1,294,292
Glassware	224,091	329,920	326,572	265,636
Glue Ph. Adhesive	82,455	37,091	33,277	28,656
Kava powder	18,730	15,524	19,446	11,747
Kitchen utensils, crockery & cutlery	1,606,240	2,013,473	1,557,034	1,100,596
Mats, all	34,312	77,524	38,339	34,943
Metalware, others	2,950,950	5,370,516	3,987,799	4,544,494
Musical instruments	194,136	317,205	147,026	399,062
Office equipment & supplies	1,338,046	735,674	1,125,449	715,134
Others	2,424,192	2,015,260	2,204,531	2,218,404
Paper & cardboard	4,782,246	5,234,334	4,583,940	4,547,476
Other paper & school supplies	540,040	252,939	545,282	462,625
Perfumery	112,884	77,262	42,387	83,776
Photographic goods, all	190,607	113,257	200,697	250,938
Pig feed	286,676	302,884	801,269	186,370
Soap, all	1,829,532	1,853,920	1,463,331	1,934,279
Toiletry articles	2,707,840	2,429,832	3,146,386	2,547,302
Toys & notions	450,823	206,133	224,350	295,139

<i>Continued.....</i>	2002	2001	2000	1999
Wood crafts	122,658	215,798	127,460	186,973
Tin plates	54,105,347	54,959,271	52,861,239	48,859,559
Plastic bottles	290,586	286,589	123,507	239,342
Oil, cooking	3,253,894	3,449,685	2,925,993	3,073,146
Alcoholic Beverages and Cigarettes	4,583,657	2,917,228	2,704,096	3,009,448
<i>PCE Alcohol and Cigarettes</i>	<i>4,583,657</i>	<i>2,917,228</i>	<i>2,704,096</i>	<i>3,009,448</i>
Beer, all	2,505,287	1,174,655	1,128,359	875,978
Hard liquor, all	392,924	578,019	415,686	208,632
Cigarettes, tobacco, all	1,685,447	1,164,554	1,160,051	1,924,838
Building Materials	17,790,516	19,929,134	17,314,201	19,322,360
Building materials	5,214,458	7,950,780	7,276,213	5,769,887
Cement	1,618,920	1,254,263	842,245	1,238,476
Electrical goods	6,044,243	5,652,058	4,868,388	5,070,915
Lumber, treated	1,470,570	1,394,017	1,666,609	2,219,636
Lumber, untreated	48,913	129,063	46,742	58,464
Masonites & panel boards	113,990	189,674	239,592	362,126
Paint	419,671	489,355	527,923	1,007,226
Plywood	878,158	679,745	692,158	915,833
Roofing materials, all	472,816	512,927	230,732	517,933
Tools	1,286,633	1,134,018	712,906	1,190,249
Wire articles	222,144	543,235	210,693	971,615

Sources: Import Trade Data- Department of the Treasury, Customs & Excise Tax Division, Bureau of Labor Statistics. Producer Prices and Price Indexes

D.1.4.2 Calculations of Net Exports

Most of the information is now in place to calculate final expenditures on net exports. The calculation is straightforward, involving nothing more than subtracting imports of goods and services from exports of the same.

Summary figures found in Table D.1.4.1 are the imputation-adjusted-deflated value of imports f.o.b., net of cannery purchases of landed fish. Thus to arrive at the NIPA figure for imports, three procedures must be performed: 1) scale up imports from f.o.b. (free on board) value to c.i.f. (cost, insurance, freight) value²². The NIPA team feels that a 25% mark up on customs declared value is appropriate, 2) add in cannery imports of landed fish. In this instance, cannery reports data replace customs data. Until more information is available, service imports will be limited to freight and insurance charges levied on foreign merchandise arriving in American Samoa. Other service imports are considered negligible.

²² BEA records the value of merchandise imports based on customs value, or the price actually paid at the foreign port of exportation, excluding import duties, freight, insurance and other charges. However, for every merchandise item brought into the U.S., there is an additional linked service import which reflects the cost of insurance and freight on said item.

Table D.1.4.2.1 Total Imports (\$1999=100)

	2000	1999
Adjusted Merchandise Imports	235,248,707	235,436,953
Service Imports	58,812,177	58,859,238
Cannery Imports of Landed Fish	220,422,989	241,568,970
Total Imports	514,483,873	535,865,161

Sources: Cannery Data***, Table D.1.6.1

While American Samoa exports are overwhelmingly composed of canned tuna, there are significant quantities of pet food, fish meal, finished garments and mats which also need to be included to complete the description of American Samoa sales to the rest of the world.

Table D.1.4.2.2 Total Exports (\$1999=100)

	2000	1999
Tuna Exports	468,676,439	453,414,000
Deflated Exports, other	13,392,929	10,893,656
Total Exports	482,069,368	464,307,656

Sources: American Samoa *Import Trade Data- Department of the Treasury, Customs & Excise Tax Division****, U.S. Bureau of the *Census Foreign Trade****

Table D.1.4.2.3 Net Exports (\$1999=100)

	2000	1999
Net Exports	-32,414,505	-71,557,505

Sources: American Samoa *Import Trade Data- Department of the Treasury, Customs & Excise Tax Division****, U.S. Bureau of the *Census Foreign Trade****, Cannery Data***, Table D.1.4.1

D.2) Facts, Figures and Caveats

With the inclusion of imputations²³, GDP in 1999, the interim benchmark year, is in the neighborhood of \$444.2 million dollars when measured from the product (final expenditure) side. Summing up the relevant income streams (factor costs) produces an estimate of \$474.1 million in 1999 and \$418.7 million in 2000. In 2000, constant dollar GDP measured as product is \$437.8 million, and \$458.9 million (nominal) measured as income. Though negative real growth seems to have occurred in final expenditure GDP, the reader should not make too much out of the implied 1.43% decrease. The estimates beyond 1999 are highly influenced by uncertain swings in trade and government expenditures, and have other embedded variances. For this reason, modest lapses in growth could in fact be zero or even positive given the amount of noise in the data. To make this point even clearer, individual table entries in 2000 are given multiple asterisks wherever there is significant concern about their reliability.

Without imputations for subsistence agriculture and rent, 1999 GDP is probably some \$68.5 million dollars lower falling to \$369.6 million. Even if one retains the imputations,

²³ Imputation for: rent and consumption attributed to owner occupied housing, and for income and consumption attributed to subsistence agriculture,

when provision is made for the nationality as opposed to the locality of the income and product being generated, GNP, the alternative measure, is smaller still at \$350.7 million²⁴.

In the opinion of most economists, the portrait of economic activity at the country level does not necessarily represent the well being of the individual. For this reason, it is more enlightening to focus on personal income per capita²⁵. Census estimates of personal income in 1999, adjusted to BEA definitions, place the average American Samoan resident's income from all sources at \$4347²⁶. However, when provision is made for imputed rent and subsistence agriculture²⁷, the figure rises by \$1197 to \$5544. The addition of business transfers, net government subsidies, indirect business taxes and capital depreciation completes the transformation to gross national income of \$6332. This latter number corresponds to the lower middle income category defined by the World Bank²⁸

Because this is a first attempt, the NIPA team is still gaining experience. The numbers reported here are not as thorough or precise as those estimates crafted by an established NIPA statistics shop. Clearly, there is room for improvement: 1) synthetic estimates/imputation procedures affect measurements for over 69% of interim benchmark final expenditures and 45% of interim benchmark national income. If the extreme assumption is made that all of the maximum potential variances are fully realized, then \$89.1 million of final expenditure uncertainty is identified (see section 6.3.1). Accepting this figure creates a gray zone around the GDP estimate roughly 20%. Tempering this impression somewhat is the fact that the 1999 statistical discrepancy of \$-29.9 million is roughly 6.7%²⁹ of estimated GDP. This percentage compares very favorably with U.S

²⁴ We estimate that \$111.6 million in cannery operating surplus was not captured by American Samoa in 1999. Also refer to Appendix B for calculation of operating surplus. Canned tuna sales are not realized until the product reaches the target market. The reader is also asked to keep in mind that all of the above figures are net of: imports declared by individuals for personal use and thus not recorded by Customs; income earned but not reported to the tax authority by illegal aliens; and construction activity associated with the military.

²⁵ The distribution of income should also be analyzed, but reliable data to perform this calculation are not available at this time.

²⁶ See Section D.1.1.1. Personal income is estimated to be \$248,855,179; population in 1999 is 57250.

²⁸ See *World Development Report 2003*, Table 1. pp. 234-5. Per capita gross national income for lower middle income status, on a PPP adjusted basis, was \$5020 in 2001. A representative sample of countries falling into this category include, inter alia,; Algeria, Bulgaria, Columbia, Dominican Republic, Kazakhstan, and Lebanon. World Bank numbers do not appear to include imputations for rent or subsistence agriculture.

²⁹ The statistical discrepancy in 2000 though not shown is 4.3% based upon nominal GDP of \$437,889,511. For the 1999 calculation, the measured closeness of the estimates is slightly exaggerated because the left and right hand sides of the account are not fully independent. Personal consumption expenditures were derived from Census records on personal income, and thus track the compensation data used in the factor cost approach. While we have confidence that this method produces the best estimate, had actual expenditures on merchandise been used instead, the statistical discrepancy would probably have been larger. Trade based estimates of PCE are roughly \$44 million less than the PCE figure reported in the summary account tables. If that proxy figure were correct, then the statistical discrepancy would balance the two sides of the ledger only if it increased from \$-29.9 (6.7%) to -\$46.7 million (10.5%).

experience (< 2%), and provides reassurance that the effort is moving out of terra incognito.

Recognizing these deficiencies, the team has proposed a series of organizational and statistical initiatives to replace these imputations with improved data sets in the near future. Thus, there is every reason to expect continual improvements in the accounts over the next few years, especially after the benchmark value added estimates become available in March 2004.

For the time being, one must be content with the numbers as they are and try to assess their reliability. As long as the benchmark value added estimates are not available, it is not possible to give sure answers to questions about the range of variation or confidence one can place in some of the more important NIPA aggregates, let alone individual line item NIPA entries. Nevertheless, it is still possible to place bounds on some of these synthetic measures for the major line items in the sense that more than one method can be used to estimate a missing variable.

Table M2: Personal Income and Outlay Account

Line		2000	1999	Line		2000	1999
1	Personal tax and non-tax payments (3-12)	12,635,883	12,888,134	7	Wage and salary disbursements (1-3)	181,130,101	178,629,291
2	Personal outlays	306,632,439	309,011,124	8	Other labor income (1-7)	3,593,476	3,676,596
3	Personal consumption expenditures (1-36)	297,712,439	298,677,124				
4	Interest paid by persons (2-17)	4,120,000	3,534,000	9	Proprietors' income with inventory valuation and capital consumption adjustments (1-8)	55,534,116	54,656,198
5	Personal transfer payments to the rest of the world (net) (4-6)*	4,978,000	4,978,000				
6	Personal savings (5-4) ³⁰	4,424,825	-3,831,392	10	Rental income of persons with capital consumption adjustment (1-9)	40,327,609	38,766,824
				11	Personal dividend income	832,118	843,917
				12	Dividends (1-15)	2,991,801	2,376,932
				13	Less dividends received by government (3-6)	2,159,683	1,533,015
				14	Personal interest income	12,184,142	10,641,561
				15	Net interest (1-19)	6,622,499	5,375,214
				16	Net interest paid by government (3-5)	1,441,643	1,732,347
				17	Interest paid by persons (2-4)	4,120,000	3,534,000
				18	Transfer payments to persons	34,719,258	33,439,785
				19	From business (1-22)	163,710	250,579
				20	From government (3-3)	34,555,548	33,189,206
				21	Less Personal contributions for social insurance (3-17)	4,439,673	4,408,306
	PERSONAL TAXES, OUTLAYS AND SAVINGS	323,881,147	316,245,866		PERSONAL INCOME	323,881,147	316,245,866

Sources: American Samoa *Internal Revenue Service/Treasury Tax Returns****, Table M1, M3

³⁰ Personal savings are calculated as a residual to balance the estimate of personal income with the estimate of personal taxes, outlays and savings. It is reassuring post facto, that the residual estimates of savings vary between 0.1 and 3.3% of personal income. These numbers are within the range outside experts suggested for the savings rate used in the derivation of PCE.

Table M3: Government Receipts and Expenditures Account

Line		2000	1999	Line		2000	1999
1	Consumption expenditure ³¹	117,158,609	129,876,293	12	Personal tax and non-tax payments (2-1)	12,635,883	12,888,134
2	Transfer payments	34,555,548	33,189,206	13	Corporate profits tax liability (1-13)	3,393,512	3,497,922
3	To persons (2-20)	34,555,548	33,189,206				
4	To the rest of the world (4-7)	***0	***0	14	Indirect business tax and non-tax liability (1-24)	6,118,823	14,226,647
5	Net interest paid (2-16)	1,441,643	1,732,347	15	Contributions for social insurance	15,425,698	15,406,343
				16	Employer (1-6)	10,986,025	10,998,037
6	Less dividends received by government (2-13)	2,159,683	1,533,015	17	Personal (2-21)	4,439,673	4,408,306
7	Subsidies less current surplus of government enterprises	-7,307,994	-9,605,320				
8	Less wages accruals less disbursements (1-4)	0	0				
9	Current surplus or deficit (-), national income and product accounts (5-12)	31,965,605	51,053,936	18	Receipt of U.S. Grant Money	138,079,811	158,694,400
	GOVERNMENT CURRENT EXPENDITURE AND SURPLUS	175,653,728	204,713,447		GOVERNMENT CURRENT RECEIPTS	175,653,727	204,713,447

Sources: American Samoa *Budgetary Reports*, Tables M1, M2,

³¹ Deflated using CPI.

Table M4: Foreign Transactions Account

Line		2000	1999	Line		2000	1999
1	Exports of goods and services (1-48)	482,069,368	464,307,656	3	Imports of goods and services (1-49)	514,483,873	535,865,161
2	Income receipts (1-32)	138,079,811	158,694,400	4	Income payments (1-33)	110,294,774	111,610,237
				5	Transfer payments to the rest of the world (net)	4,978,000	4,978,000
				6	From persons (net) (2-5)	4,978,000	4,978,000
				7	From government (net) (3-4)	0	0
				8	From business (1-23)	0	0
				9	Net foreign investment (5-3)	-9,607,468	-29,451,342
	RECEIPTS FROM THE REST OF WORLD	620,149,179	623,002,056		PAYMENTS TO THE REST OF WORLD	620,149,179	623,002,056

Sources: American Samoa Import Trade Data- Department of the Treasury, Customs & Excise Tax Division***, Tables M1, M3

Table M5: Gross Savings and Investment Account

Line		2000	1999	Line		2000	1999
1	Gross private domestic investment (1-40)	24,116,139	27,028,423	4	Personal saving (2-6)	4,434,825	-3,831,392
2	Gross government investment (1-50)	31,316,829	60,213,551	5	Wage accruals less disbursements (private) (1-4)	0	0
3	Net foreign investment (4-9)	-9,607,468	-29,451,342	6	Undistributed corporate profits (see 1-10, 1-16, 1-17 and 1-18)***	1,149,151	6,704,657
				7	Consumption of fixed capital (1-26)	29,265,688	33,713,973
				8	Private (1-27)	11,320,184	10,452,258
				9	Government (1-28)	17,945,504	23,261,715
				10	General government (1-29)		7,957,371
				11	Government enterprises (1-30)	17,945,504	15,304,344
				12	Government current surplus or deficit (-) national income and product accounts (3-9)	31,965,605	51,053,936
				13	Statistical discrepancy (1-35)	-20,989,768	-29,850,541
				14			
	GROSS INVESTMENT	45,825,500	57,790,632		GROSS SAVING AND STATISTICAL DISCREPANCY	45,825,500	57,790,632

Sources: Tables M1, M2, M3, M4

E) CHOICE OF MEASUREMENT TECHNIQUE

It is reassuring to find that the 1999 end year NIPA estimate of Personal Income (PI) (\$247,665,861³²), which is based primarily on the wage and salary data gathered by the tax authority, is virtually identical to the estimate derived from the 2000 Census (\$249,616,889). This implies that the subsequent (imputation free) estimate of Personal Consumption Expenditures (PCE) (\$230,097,119), which is derived indirectly from the Census PI, is not marred by significant underreporting of income in the latter.

To test the robustness of the Census PCE estimate, a second calculation based on extrapolating the 1995 HIES is reported. The “1999” end year HIES amounts to \$256,676,531 and is presumably gross of subsistence agriculture consumption and imputed rent (see Sections D.1.1.2 page 14 and D.1.1.3 page 16). To ensure comparability, it is necessary to add roughly \$68,580,005 to the Census figure since the latter, being an income based construct, does not include subsistence consumption or imputed rent. Given these considerations, PCE could be between \$257 and \$292.5 million. Put differently, measuring technique imparts roughly 12% variability to the estimate.

Lacking the appropriate census or survey materials, the NIPA team devised synthetic estimates for investment in residential and non-residential structures. Two approaches were taken:

- The first examined total construction activity, which was reported to authorities in the LUP (land use permit database). This method identified \$30,356,575 worth of such activity in calendar year 2000.
- The second method calculated the value of construction projects from the cost of material and labor inputs, and produced a year 2000 estimate of \$40,925,480. Again, measuring technique imparts variability but this time it could be as much as 33%.

Deflation of the net export series using different PPI indices is another source of variability in the estimates of final expenditure GDP. In this instance, both domestic and export PPIs were applied to the nominal dollar imports (net of landed fish). At most, the choice of PPI caused the value of imports to vary by 1 percentage point, or roughly \$2 million. As a final cross check on the procedure, the CPI was substituted for the PPIs. This caused the deflated value of imports to rise by roughly 5%, or \$11.3 million dollars, above the PPI adjusted figure.

Imputation to the trade data is another source of variability. The key assumptions are that any trade item series containing individual values less than 50% of the series maximum, and worth more than \$1,000,000 will trigger identification as a possible outlier. This rule

³² Wages for calendar year 1999 were estimated using average wages per employee in 2000 and average employment in 1999.

produces an upward revision of \$21.5 million in estimated trade³³. But these assumptions can be relaxed. If the trigger is set at 25% and \$500,000, an additional \$13,928,552 in trade, beyond the \$79,086,653 already detected, could be subject to revision. By implication, if the imputation correction procedure is proportional, this might add as much as \$3,783,966 to estimated f.o.b. imports. Put differently, the choice of trigger can cause the value of imports to vary by 1.6%.

If the extreme assumption is made that all of the above potential variances are fully realized, then \$82.6 million of final expenditure uncertainty is provisionally identified. Summing them translates into a gray zone around the GDP estimate of almost 19%.

By implication, sensitivity to measurement technique then becomes the first default standard for determining the plausibility of any given number. In other words, if the magnitude of the imputed variable is not sensitive to the choice of imputation technique, one can probably place more confidence in the accuracy of the estimate. The second standard for determining plausibility is compositional normality as measured by the percent of final expenditures falling into PCE, I, G or (X-M). In this instance, a set of reference/ analog economies is used to determine the typical range of final demand percentages found in each of the final demand categories.

³³ For another perspective on the reliability of the trade data, consider the following thought experiment: Section D.1.1.4-page 17- reports roughly \$92.5 million in import-identified-PCE-type expenditures. Household purchases of these same goods, when scaled by 30% for C.I.F. and excise taxes, results in an estimated retail value of \$120.25. To this figure add \$68.2 million for services and \$68.6 million for imputed rent and subsistence agriculture to arrive at total PCE of \$257 million. This PCE estimate is \$35 million less than the value reported in the Summary tables. For parity, there would have to be additional imports that were coming into American Samoa but not being captured by the Customs records. It is not hard to find examples of this type of leakage: annual air passenger arrivals routinely bring in millions of dollars of duty free merchandise.

F) ISSUES and CONCERNS

- Experience with the data inventory/assessment in American Samoa so far has uncovered a number of problem areas, the most significant of which are: outdated statistical information on personal consumption expenditures; incomplete/inconsistent records on factor income; partial records of investment activity; and excessively volatile trade data.
- Two obvious needs for the AS NIPA project are: a) stable funding resources and b) Staff devoted to work on data gathering, reviewing, analyzing and maintaining the vast amount of information collected. Federal funds provide the salary for only one staff. There are numerous surveys and censuses that need to be performed as part of the data gathering process which have neither local nor federal funds earmarked for these purposes.
- Regarding the lack of staff, currently there is only one staff working full time on NIPA activities, which is not adequate given the amount of work requires. In the first Semi Annual Report, it was recommended for establishment of the National Income and Product Unit with the Department of Commerce for the sole purpose of data collection, analysis and dissemination.
- The other concern is the lack of a legal mechanism to mandate the required data collection. The proposed Statistical Act 2003 was submitted to the Governor's Office for submission to the Fono and the latest received from them that it will be discussed in the upcoming first session. The NIPA Task Force still operates under the NIPA Executive Order that was signed by late Governor Tauese on January 15th 2003. However, this Executive Order is not sufficient to capture all the legal matters concerning NIPA.

G) RECOMMENDATIONS

➤ **Adopt AS NIPA Budget**

Presented below in Table B is the budget for salaries and expenses for the recommended AS NIPA Unit.

Table B: AS NIPA Unit Budget

Item Numbers	Categories	Detail	Total Budget	Cumulative Expenditures
1	Personal			
	Statistical Analysts (2)		\$46,680	\$46,680
	Salaries and Wages	\$20,000 X 2		
	Benefits (FICA & Retirement (16.70%))	\$3,340 X 2		
	Research Specialist (1)		\$54,915	\$101,595
	Salaries and Wages	\$45,000		
	Benefits (8.70%)	\$3,915		
	Housing	\$500 X 12		
2	Travel	\$15,000	\$15,000	\$116,595
3	Office Supplies	\$3,100	\$3,100	\$119,695
4	Office Equipment	\$12,000	\$12,000	\$131,695
5	Workshop/Training/Task Force Meeting	\$5,000	\$5,000	\$136,695
6	Printing/advertising/dissemination	\$5,000	\$5,000	\$141,695
7	Contractual Services	\$43,305	\$43,305	
	TOTAL BUDGET			\$185,000

➤ **Establish the American Samoa Income and Product Account (AS NIPA) Unit.**

The NIPA Unit is proposed to establish within the Department of Commerce as the main repository for all NIPA information needed to complete the five NIPA accounts. The NIPA Unit is solely responsible with the assistance of the Statistics Division for all NIPA information gathering; analysis; publication and also provide technical staff support for the NIPA Task Force. In other words, NIPA Unit will be the clearinghouse for all NIPA information related activities. Since this is the first time to establish this Unit, there is obviously the need for staff, equipment and supplies for the initial startup phase of this Unit. Presented below is the NIPA budget recommended for adoption.

➤ **Publication and Dissemination of Information**

All NIPA information must be approved by the Advisory Group before submitting it to the Governor for adoption and then publish and disseminate as

public information. All the financial responsibilities for publication and dissemination of NIPA information are that of the NIPA Unit.

➤ **Purpose of American Samoa NIPA Estimates**

The NIPA record measures the flow of production, income, and use of income for consumption, investment, and saving. These decision-making units are grouped into three sectors- businesses, households, and nonprofit institutions serving households, and general government. They are designed to shed light on the value and composition of national output and the distribution of incomes generated in production.

The intent of NIPA policies is to provide a basis for individual policymakers to develop economic policies, and to evaluate individual economic sectors on their performance in the overall Territorial economy.

➤ **Training Initiatives**

Training initiatives is a very critical avenue that is vital for a continuous data gathering process of economic, social and demographic statistics. The information published and disseminated by the Department of Commerce is always out of date hence prompt the need to do something to bring it to date. Statistical workshop training is seen here as the immediate step to take.

Hence, it is being recommended here for a two part statistical workshop trainings to be conducted in which all stakeholders will participate. Firstly, to hold a workshop for all agencies partaking in gathering of all sets of statistical information economic, social and demographic anchoring on different aspects of the data gathering process-classification, definitions, methodologies etc. Secondly, specifically for the NIPA project and its stakeholders to participate in a week long workshop training on *Statistical Methodology for Measuring Economic Development and Economic Growth*.

➤ **NIPA Strategic Plan 2004**

Apparent from the discussions above that there is a great need for a short and/or long term strategic plan for NIPA that outlines the work that needs to be done in terms of surveys, census and other data collection as well as inter-agencies roles in data gathering. Appendix A contains the proposed NIPA Strategic Plan 2004 which outlines all necessary surveys that need to be carried out as well as each agencies' roles. It is hereby recommended that the NIPA Strategic Plan 2004 be adopted as the foundation for carrying this NIPA project to the next level and further

H) NEXT STEPS

While the series of workshops and consultations has been very productive, there still remains a significant amount of analysis and data gathering to conduct before a complete set of NIPA's can be produced. The first objective must be, wherever practical, filling in missing numbers with actual data; and replacing the remaining imputed values with estimates derived from appropriately designed surveys and censuses. Leftover tasks from the August 2003 sessions and subsequent efforts through November 2003 included:

- Developing more reliable trade data. Over the next few years, implementing a new data capture system based upon a revised customs form and automated software,
- Creating survey based trade deflators to replace the proxy deflators derived from the U.S. PPIs. Assistance from IPC/BLS will be needed to accomplish this,
- Obtaining sample tax information which allow imputation for the income of non-filing proprietors,
- Clearing up ambiguities in the measurement of corporate profit,
- Re-examining the banking data on money transfers; clearing up the uncertainties; and determining how the modified numbers fit into the NIPA framework,
- Initiating the process of taking a survey of retail trade and services. This action will ultimately relieve the pressure to derive PCE growth rates from the trade data. The replacement will employ BEA sanctioned methodology. Assistance from IPC/Census will be needed to accomplish this,
- Initiating the process of taking a construction survey. This action will allow us to improve significantly on the current incomplete estimates of construction investment, which, by default, are based on the LUP and other administrative records. Assistance from IPC/Census will be needed to accomplish this,
- Initiating the process of taking a capital expenditures survey. This action will allow us to avoid using the current incomplete estimates of investment in machinery and equipment, which, by default, are based on the trade data and other administrative records. Assistance from IPC/Census will be needed to accomplish this,

- Preparing the data from the Economic Census for the calculation of the benchmark estimate of GDP. Rubin is planning on returning to American Samoa when Company Statistics Division (CSD) releases the Census data.

J) APPENDIX
Appendix A: Strategic Plan Schedule of Data Collection and Reporting for NIPA January 2004

Goal: This is a brief description of the activities of the Statistical Division of ASDOC in its efforts to collect data throughout the Territory for the purposes of fulfilling the National Income and Product Account (NIPA) project. This paper will describe the various upcoming new census and surveys, establishing the schedule for their implementation, and explain other related data collection acts.

Background: The census and surveys listed below are included under the National Income and Product Account (NIPA), statistical division, of the Department of Commerce. Any other future renewals or updates of such, or additional reports that contribute to the economic description of the Territory would fall under these five accounts. The assemblage and reporting of these data collections are directed toward analysis and management by appropriate governmental bodies (see below). Any use of the data for planning and policy making by the government must be based on correct and complete statistical information of various aspects/characteristics of the Territory.

Guidelines for data requirements and methodologies are set forth by the US Bureau of Economic Analysis. NIPA reporting also employs the North American Industry Classification System (NAICS), and the Harmonization System (HS) for imports classification. NIPA information is segmented into the five summary accounts:

- Account 1: National Income and Product Accounts
- Account 2: Personal Income and Outlay Account
- Account 3: Government Receipts and Expenditures
- Account 4: Foreign Transaction Account
- Account 5: Gross Savings and Investments Account

Methodology: Survey and data collections will be conducted in an ongoing basis, (see suggested schedule below), using Statistical Division personnel, outside consultants and temporary workers. The following lists show the key data sets that have been used extensively thus far for final expenditure estimates of national product and the estimation of GDP. Final estimates of the NIPA will be based upon numerous data sources that will undergo constant revision and checking for accuracy and relevancy. Publication of NIPA results for analysis and distribution will be completed with each survey and final results submitted to the Governor.

Personal Consumption Expenditures (PCE)

1995 Report of the 1995 Population, Housing and Expenditure Survey (HIES)
2000 Census of Housing and Population

1999 Census of Agriculture
1999-2002 Import Trade Data- Department of the Treasury, Customs & Excise
Tax Division

Gross Private Domestic Investment (I)

Land Use Permit Data Base
Import Trade Data- Department of the Treasury, Customs & Excise Tax Division
ASG Budgetary Reports
Construction Survey

Government Expenditures (G)

ASG Budgetary Reports CARF reports 1998 to 2003

Net Exports (X-M)

Import Trade Data- Department of the Treasury, Customs & Excise Tax Division
Cannery Reports
Government Foreign Purchases
U.S. Government trade documents

Interdepartmental Considerations: In the ongoing data collection processes leading to approved and acceptable reporting, the Statistical Division of DOC works closely with other areas of the AS government to assess, direct and fully implement the conditions of data collection. These other departments are included in the NIPA Working Group, reporting to the Advisory Group, and principally act to implement and verify the goals of the NIPA data collection processes.

- **Customs:** With the addition of a new computer system at the Territory's ports of entry, it is anticipated that the record keeping and storage of up-to-date immigration and customs information will be upgraded and easily accessible for NIPA purposes. This area is also responsible for Account 4 above.
- **Legal:** All methods and uses of the NIPA information will be in accordance with Territory laws and statutes. Within the NIPA structure, standards are determined by the US Bureau of Economic Analysis and other US statistical bodies, as mentioned above. The NIPA project also holds a detailed policy of confidentiality and reporting compliance. The NIPA Working Group maintains constant referral to legal counsel in all of its activities. The NIPA project anticipates being established as permanent law, to be approved before the Fono as the Statistical Act.
- **Taxes:** Full capability and cooperation of all areas of taxation within the Territory will provide the most succinct and complete data for NIPA. These include determining much of the necessary income and expenditure information and other data necessary for Accounts 1 and 2, and some of Account 4, above.
- **Treasury:** Likewise, and in cooperation with taxation divisions, full capability and cooperation of all areas of Treasury will contribute to a more

complete and accurate NIPA reporting facility. Particularly for information in Account 1 and 3 above.

- **Department of Public Works** – Building Branch Division: investment data includes capital equipment and improvements. Type and value of investment both residential and commercial should be provided on a monthly basis from routine inspections.

Business Community and Chamber of Commerce: It is important that the business community be fully informed and cooperative to ensure that the most complete and correct data is collected for all business activity in the Territory. Many of the following scheduled surveys and census' depend upon quick response and reliable information from this group. And consequently, the final calculations of the GDP and primary NIPA results depend upon the truth and completeness of the numbers given. The AS Chamber of Commerce should be instrumental in motivating and enforcing the informed cooperation of the business community for this purpose. Working together with DOC and the NIPA Task Force, the COC can be a strong link between the individual entrepreneur and the Territory's economic policy planning.

Village and County Community issues: As with all matters that will involve the participation and involvement of the AS population, the NIPA framework needs to be presented to the various communities throughout the Territory for their input and agreement. This can also be accomplished by information dissemination via the numerous project publications and active participation in the censuses as they occur. Special meetings for additional explanation or exchange are readily encouraged.

Long-range strategic goals: The American Samoa NIPA project is the first undertaking of its kind in the Territory and for all of the other 5 U.S. insular areas. Therefore this project serves as the template and developed guideline for all other related island groups. The original timeline for NIPA activates was divided into three phases:

- Phase 1, the first retail survey with finalized NIPA estimates for 1998 – 2000;
- Phase 2, construction survey and finalizing of data 2001-2003,
- Phase 3, 2004 data collection with norms established for subsequent years plus setup and running of the HEIS.
- In-country 2 weeks training course for all statistical personnel employed with NIPA. This is to teach statistical methodology and particular NIPA procedures for measuring economical growth and productivity.

The reality of the NIPA project activities has led to a revision of the schedule to include current consideration of the following additional activities:

- 1. Agricultural Census Jan-Mar 2004 (\$50,000)**
 This is an informal sector statement of data, which will include household consumption plus agricultural produce. Information will also be collected from the agricultural industry using commercial resources where agricultural products are stored, processed or sold. The survey results will provide measurements for both formal and informal sectors of the agricultural economy.
- 2. Survey of Compensation and Employment Jan 2004-Ongoing Quarterly (Not funded)**
 This will collect data from business, government, personal and retail sources to give levels of income from compensation and persons employed for each quarter. These numbers will provide two of the basic contributions to a prompt GDP estimate. Resources will be ASG Treasury and Human Resources.
- 3. Retail Trade and Service Survey April-Dec 2004 (\$40,000)**
 This survey targets select business and service industries. It will be an update on the 1995 Mid Decade Census, which was done previously for Personal Consumption Expenditures (PCE) distribution. This will serve as the preliminary survey to feed into the HIES.
- 4. Construction Survey April-Dec 2004 (Not funded)**
 This is to measure the value of investment on finished construction, and work in progress for all types of residential and non-residential, including commercial, churches falesamoa's, community halls, schools, etc This will be input for both the Investment (#5) and Product (#1) accounts of NIPA. And also fulfill one of the most important economic indicators, "Housing start-ups".
- 5. Mid-Decade Census and Household Income Expenditures Services (HIES) 2005 (Not funded)**
 This survey is a collection of population, housing and household expenditure (personal consumption expenditure (PCE)). The results will give current demographic, social and economic profiles of the territory five years after the regular census of 2000. The PCE accounts for 70% of the GDP calculation and figure heavily in other economic indicators. This is one of the most complete collections of information and culminates the ongoing efforts of the Statistics Division.
- 6. Continued Collection of Administrative Data Ongoing**
 The following goals will underlie the current activity of data collection and processing for clear and concise recording:

 - Improve the various collection processes in relation to statistical standards for subject matter, particularly in the Customs area.
 - Continue the Statistical Yearbook collection and publication

- Coordinate the government agencies particularly those named above, to plan and act on the described methods
- Standardize reporting requirements and statistical definitions for trend analysis

Additional small surveys are forecast for an unspecified time in the future to further expand the statistical information and investment data resources for more explicit and complete economic indicators:

- Construction Index
- Customs and Trade
- Governmental Internal Financial Data, i.e. Treasury

Status of current projects, in process:

1. Economic Census Report: data was collected and consolidated in April-June 2003. The final report is due out in early 2004
2. The Statistical Act will be presented before the Fono at the beginning of their next session in Jan 2004

J) Appendix B

Deriving Operating Surplus in the Cannery Industry (current year \$)

We perform the calculations below to provide a more complete picture of: 1) how cannery activity affects final demand through the net export sector of the economy, and 2) how these trade flows are connected to the corresponding generation of income through the retention/non retention of profits in American Samoa. Estimates produced here are vital to the conversion of GDP to GNP.

In 2002, there were \$482,555,000 dollars in gross revenue (export value) of fish and fish products. Monthly industry reports indicate that imports of landed fish cost the canneries \$218,363,820. In the government study on the economic impact of the minimum wage, cannery officials indicated that landed fish account for 70-75 percent of the cost of goods sold (COGS). Thus, dividing the value of landed fish by the midpoint percentage, 0.725, yields the COGS of \$352,795,768 reported below. If employee compensation costs of \$43,000,000 are deducted from COGS, the remainder, \$309,795,768 is intermediate purchases. In the last step of the calculation, value added of \$172,759,232 is obtained by subtracting intermediate purchases from the gross revenue (export) figures.

By definition, value added estimated using the first method must equal value added calculated using the second method. Not all of the pieces of data are in place to implement the second approach directly because we lack data on operating surplus. However, by imposing equality between the two methods, operating surplus can be calculated as a balancing residual. With compensation of \$43,000,000, depreciation a maximum of \$9,318,361 (IRS value of depreciation for all corporations combined), and \$0 in indirect business taxes; operating surplus would have to be \$120,439,871 (see table B.1). If this \$120 million figure is valid, the NIPAs will be seriously distorted (understated) on the income side (left hand side of Account 1) by a similar amount.

Table B.1 Operating Surplus

	2002	2001	2000	1999
Exports of Fish from the FT Reports	482,555,000	411,439,000	436,858,000	453,414,000
COGS	352,795,768	374,023,874	317,243,865	333,198,579
Intermediate purchases	309,795,768	332,436,567	275,656,558	289,519,778
Value Added in the Canneries, Method I	172,759,232	86,445,690	161,201,442	163,894,222
Total Wages and Salaries	43,000,000	*41,587,307	41,587,307	*43,678,801
Indirect Business Tax	0	0	0	0
Depreciation	9,319,361	9,319,361	9,319,361	8,605,184
<i>Operating Surplus</i>	<i>120,439,871</i>	<i>28,095,765</i>	<i>110,294,774</i>	<i>111,610,237</i>
Value Added in the Canneries, Method II	172,759,232	79,002,433	161,201,442	163,894,222

Sources: *Import Trade Data- Department of the Treasury, Customs & Excise Tax Division, American Samoa Budgetary reports, Monthly Cannery reports***, FT895 U.S. Trade with Puerto Rico and U.S. Possessions, author's calculations using appendix E, table E2.2. *Data not available, therefore estimated.*

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L) Dr. Marc Rubin's Resume.

Marc Rubin is currently employed as Special Assistant to the Associate Center Chief for Demographic and Economic Analysis in the International Programs Center (U.S. Bureau of the Census). In this capacity, Rubin serves as an "in-house" consultant on matters pertaining to general economic measurement and modeling; adoption of best practice project management techniques; and the development of a long-term research program covering socio-economic trends in the transition economies of the former Soviet Union.

Since 1999, Rubin has also been working as a part-time consultant, under contract, to the U.S. Department of Interior. He has been tasked to produce comprehensive national income and product accounts (NIPA) for the insular areas, and to date, has conducted training workshops in American Samoa, the Commonwealth of the Northern Mariana Islands, and Guam. Under Rubin's direction each territory has already, or shortly will, begin to gather the data necessary to produce annual and quinquennial estimates of gross national income and product. Rubin, working in close contact consultation with local staff, is developing the data sets used to fill in the NIPA templates, and teaching the methods necessary to estimate GDP and its various components using the same island-supplied data. Over the course of two years, the plan is to institutionalize the capacity to generate the estimates indigenously without significant outside assistance.

Prior to coming to the Census Bureau, Rubin spent ten years in academia teaching various courses in economics, and five years in the government and the private sector doing economic consulting on trade and energy issues.

Rubin did his undergraduate training in economics at Cornell University (1968) and completed his education with the Ph.D. in economics from the University of Pennsylvania (1977). More recently, he received both a Master's and Advanced Master's Certificate in Project Management from the George Washington University (2001, 2002). In conjunction with that training, Rubin took the board examination to earn professional certification in project management from the Project Management Institute (2001).