APPENDIX I

Technical Information

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TONGA STATISTICAL DEPARTMENT
Appendix I to the National Accounts Statistics Bulletin 2022-2023

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1. Introduction

The Statistics Department Tonga is responsible for the compilation of Tonga's National Accounts. National Accounts statistics are available from the department and will be published annually on the Tonga Statistics Department's website http://tongastats.gov.to approximately 9 months after the end of the financial year reference period or you can request from the Department.

National Accounts compilation and GDP estimation, have a long history in Tonga which dates back to 1969-70 with the Statistics Section of the Ministry of Finance, before it became a department in July 1975. The Tonga Statistics Department (TSD) has a series of GDP estimates starting from 1993-94 and ending in 2022-23 which are all available on the department's website. Early GDP estimates were compiled by experts from the Commonwealth Secretariat in London with assistance from the regional agency. Further, a resident economic statistics advisor funded by Australian AID assisted the department for the compilation of GDP estimates from 2011 to early 2013. In recent year, the division of Economics Statistics within the TSD is compiling the GDP estimates, with assistance from the Pacific Financial Technical Assistance Centre (PFTAC), a branch of the IMF located in Suva. The current estimates are being compiled using several data sources which have been explained in detail in the following sections of this Appendix.

This estimate is broadly consistent with the United Nations System of National Accounts 2008 (SNA 2008) so far as the existing data permits, and the rebase work that was conducted during 2019 to have constant 2016-17 prices.

The following two sections summarise the key sources and methods used in the compilation of the National Accounts. More information is available on request from the Statistics Department.

1.1 GDP Production Sources and Methods

GDP (P) is primarily concerned with the generation of value added. In other words, the value of all goods and services produced within the economy. FISIM is deducted from GVA for all years.

GVA is the sum of all output, less costs of intermediate inputs, or, in national accounts terms, intermediate consumption. Intermediate consumption includes raw materials, power and fuel, rental on buildings and business services such as advertising, recruitment consultancy and cleaning. It specifically excludes staff costs and capital investment which are handled elsewhere in the accounts.

There are two main types of output: (1) that produced for the market (mainly by corporations) and (2) services not for market sale (mainly by government and non-profit institutions serving households). These two types of outputs are valued differently.

Non-market output is difficult to value, as there is often no correct selling price. By convention, itis therefore valued as a sum of the costs of production. Summing costs in this way does not measure actual output but this measure provides the best available approximation GVA on a production basis and valued at basic prices. To convert from GVA at basic price to GDP at market prices, taxes on products (such as value added tax and exercise duties on alcohol, tobacco and hydrocarbon fuel) are added and subsidies on products are subtracted.

The output of goods and services comprises the value of goods and services that are the result ofproduction activity by resident units during the reporting period. This includes non-market activity for agriculture and handicraft production and owner-occupied dwellings. Indicators are estimated by type of economic activity in accordance with the Tonga Standard of IndustryClassification (TSIC 2016). TSIC 2016 has been derived from the Pacific Standard Industrial Classification 2014 (PACSIC 2014) thus follows a set of internationally agreed concepts, definitions, principles for use in the collection and reporting of statistics according to kind of economic activity.

Principal data sources are:

- Annual GDP survey of Tonga's largest businesses to collect turnover and other selected data
- Merchandise trade data from Ministry of Customs and Inland Revenue
- CT and profit and loss data for businesses registered for CT (businesses with turnover ofgreater than T$ 100,000 are required to register for CT).
- Government finance data (GFS) from the Ministry of Finance and National Planning
- MAFFF –Domestic Market Survey Report
- Household Income Expenditure Surveys (HIES) for 2000-01, 2009 and 2015-16.
- Balance of payments travel exports and non-profit organisation remittances

Output for several market industries is extrapolated from the benchmark using data collected in the annual GDP survey. These industries include mining and quarrying (sales), electricity and water (sales), transport (sales), finance (net interest income), and insurance (commissions).

For wholesale and retail trade under ISIC Rev 4, Repair of personal and household goods moves out from ISIC Rev 3 class G5260 to Other service activities.

The 2000-01 Household Income Expenditure Survey benchmark is extrapolated by (mainly) population movements for: market and non-market agriculture; and expenditure on education, health and social work, recreational, cultural and sporting activities, and other community and personal services.

For construction a combination of trade data, CT sales, and government finance data is used. Balance of payments travel exports are used as indicators in hotels and restaurants, and recreational, cultural and sporting activities.

Non-profit organisation remittances are used in NPISH education; health and social work; recreational, cultural and sporting activities; and other community and personal services. Government finance data is used in public administration and government services and indirect taxes and subsidies.
The main source for deflators is Tonga's CPI which was re-based in October 2010 using weights from the 2009 Household Income and Expenditure Survey. A few overseas price indexes are also used, for example, IMF world price indexes for construction materials still going.

1.2 GDP Expenditure Sources and Methods

Household final consumption expenditures include expenditures on goods and services from their own resources; the receipt of goods and services in kind; and production for own consumption. They are estimated in accordance with the international Classification of Individual Consumption by Purpose (COICOP), using 2001 HIES benchmarks extrapolated by merchandise trade imports, population movements, and other data from the GDP (P) accounts.

Data for final consumption expenditure of the general government sector is provided from the GFS-based data from the Ministry of Finance and National Planning. Data for final consumption expenditure of non-profit institutions serving households comes from balance of payments non- profit organisation remittances and 2001 HIES benchmarks extrapolated by population movements.

Gross fixed capital formation for construction data sources are the same as the GDP (P) estimate.Imports of capital items are used for durable equipment. Imports of passenger vehicles are split 50:50 between households (for HFCE) and other sectors (GFCF).

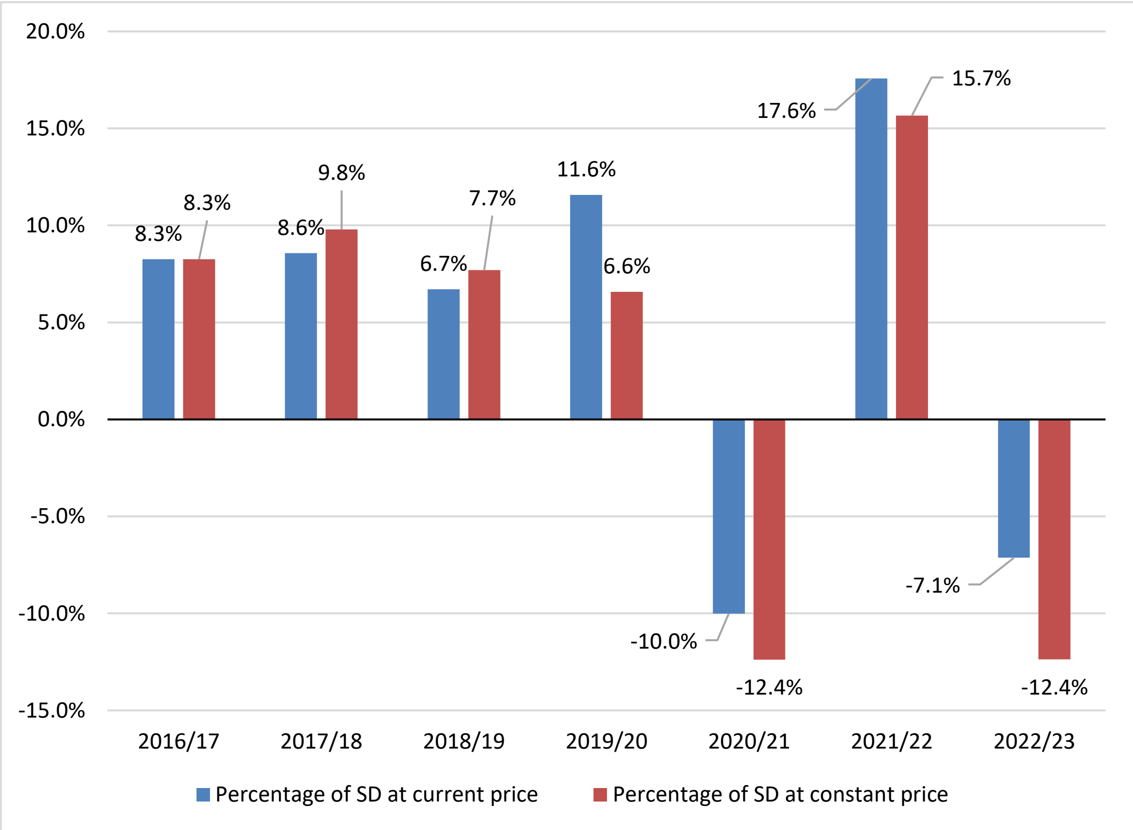
For inventories a stock building ratio is assumed at 0.5 percent of value added for mining and quarrying, manufacturing, construction, and wholesale and retail trade. The value of exports and imports of goods is determined from merchandise trade/balance of payments data.

1.3 Statistical Discrepancy

In theory, the production and expenditure measures of GDP should be in balance. In practice, there is usually a difference due to inconsistencies in data sources timing of transactions, etc. The statistical discrepancy for the goods and services account in nominal prices for 2022-23, measured as a percentage of the average of total resources and uses, was 2.7 percent which is not within the target of +/- 1.0 percent limit. In comparison, the percentage of statistical discrepancy at real price was 5.0 percent which falls outside of the target range, so further work needs to be done on this matter.

The target limit for the discrepancy between the production and expenditure measures of GDP is +/- 2.0 percent. For 2022-23, the discrepancy was negative 12.4 percent in real prices, and an average of 3.9 percent since 2012-13, which is outside the acceptable limit. For nominal GDP, SD for 2022-23 was negative 7.1 percent and averaged 5.6 percent between the years 2012-13 to 2022-23.

Figure A 1 Statistical Discrepancy as percentage of GDP in nominal and real prices



1.4 Data Sources

The TSD conducts an annual survey of selected large businesses around early February with the purpose to collect more up-to-date data for the GDP estimates. Additionally, information that was not available from previous years are not being used and industries are being revised accordingly. The Ministry of Revenue and Custom's data (consumption tax (CT), and profit and loss) from businesses registered for CT, was also used for the few businesses where survey data are not available.

The agriculture exports are compiled from the data entries submitted by importers and exporters or their authorized agents to the customs department. Agriculture commodity exports are required to leave Tonga with customs clearance documentation (mandated by the Customs Act and Regulations). For this GDP estimate, Customs Department volumes have been supplemented with Ministry of Agriculture Food and Forest (MAFF) Quarantine volumes for the major fruit and vegetable commodity exports from 2007-08 onwards. Customs Department implied prices (value divided by volume) are to revalue the total exports. Further work is on-going with the Ministry of Fishing for improvement in methodology and to supplement custom data with Fishing quarantine data similar to what is being done for the agriculture.

The provisional external account (Balance of Payments) for the fiscal years 2015-16 to 2021-22 is used in current estimates to derive other national accounts aggregates, such as the external trade components in the expenditure measure of GDP and the derivation of Gross National Income (GNI). The Expenditure on GDP, National Income, and Disposal Accounts are also provided for the same years. The old figures and tables have been revised in this report as new information and data was received over the past year. A detailed description of the data sources can be found in Part 5 of this report.

a. Revisions

A data update is a change to a previously released statistic; TSD does this when:

- new or more timely information has become available
- new methods or data sources are introduced
- existing methods or data sources are updated.

A data update differs from an error in that it is not due to a mistake, rather it is an improvement to previously published figures by incorporating the most up-to-date methods, data, and data sources available.

The current bulletin has revisions in the GDP numbers and growth rates for the previous five financial years from the last National Accounts bulletin. These are due to the revision in numbers from the various data sources including government agencies and the response of industries to our annual GDP survey of large businesses. The revisions include more complete admin data and updated population estimates.

For example, in the industrial sector, the downward revision can be linked to the delay in the construction activities of key projects like HTHH reconstruction activities and the Queen Salote wharf project. Private construction which involves residential building construction and repair also saw a fall in the value added to this sub-sector.

1.5 Change in methodology from previous National Accounts Estimates

This report was prepared by the department showing the GDP numbers calculated using the revised methodology with the base-year of 2016-17 prices developed in 2019. The report has been prepared with technical assistance provided by the IMF. For this task, Mr. Matthew

Powell, from PFTAC performed one mission, from 1 to 15 June 2023, for two weeks on-site in Tonga. He has since been giving remote assistance to the National Accounts division of the TSD. TSD sought the technical assistance for this report as result of staff turnover and new recruits to the team responsible for working on National Accounts.

The current report has revisions to previous estimates due to the incorporation of new data. For example, the new census estimates have changed the assumptions about population growth, and many data suppliers in government and the private sector have supplied data to replace preliminary estimates used previously. There have also been a revision in formulas which were previously under or over estimating the figures in the workbook.

The terms GDP at constant and real prices are used interchangeably throughout this report, as are the terms at nominal and current prices. During the 2019 rebase, a number of new data sources were introduced. To ensure international comparability in accordance with the United Nations System of National Accounts (UN_SNA 2008) the update used the new Tonga Standard Industrial Classification (TSIC) 2016 based on Revision 4 of the International Standard Industrial Classification. and spread Financial Intermediation Services indirectly measured (FISIM) across all uses rather than allocating it all to intermediate consumption.

Base year effects

New Base-Year is the most recent one than previous base-year. All commodities for each year are revalued by each corresponding price in the new base-year, usually higher than the prices in the previous base-year. Any index used in the GDP estimates has to shift to new base year as 100 and to recalculate forward and backward accordingly. As a result, the real GDP for the years prior to the new base-year are higher than the corresponding nominal GDP. The base year used in this report is 2016/17. Thus, the growth rates of GDP in the new base-year must be deferred from the growth rates derived by previous base- year

2. Concepts in the National Accounts

The following are the main concepts and definitions used in the compilation of national accounts. Every effort is made to follow these concepts although some modifications are necessary depending on the availability of data.

Gross domestic product (GDP)

Gross domestic product (GDP) is the most frequently used indicator in the national accounts. It lies at the heart of the entire system of national accounts. GDP combines in a single figure, and with no double counting, all the output (or production) carried out by all resident producer units within the country's economic territory.

There are three ways to measure GDP:

1. The production measure (GDP(P)), which is the sum of the gross value added of all resident institutional units engaged in production (plus any taxes, and minus any subsidies, on products not included in the value of their outputs).
2. The expenditure measure (GDPI), which is the sum of the final uses of goods and services (all uses except intermediate consumption) measured in purchasers' prices, less the value of imports of goods and services.
3. The income measure (GDP(I)), which is the sum of primary incomes distributed by resident producer units (not currently available in Tonga's national accounts).

Gross national income (GNI)

The term 'domestic' contrasts with 'national', as in gross national income (GNI), previously known as Gross National Product (GNP). GDP measures the total production occurring within theterritory, while GNI measures the total income (excluding capital gains and losses) of all economic agents residing within the territory (households, firms and government institutions). Residents are defined based on their centre of economic interest. To convert GDP into GNI, it is necessary to add the income received by resident units from abroad and deduct the income created by production in the country but transferred to units residing abroad.

Gross national disposable income (GNDI)

All GNI is not available for final uses domestically since some of it is transferred to other countries without anything being received in exchange, such as money sent to support dependants living in another country. Such transfers are called current transfers, and taking them into account leads to the concept of gross national disposable income (GNDI). GNDI is derived by adding to GNI, all current transfers (except social transfers in kind) receivable by that unit or sector and subtracting all current transfers (except social transfers in kind) payable bythat unit or sector.

Gross disposable Income (GDI)

Gross disposable household income is the amount of money that individuals in the household sector can spend or save after income distribution measures. This is the amount of money that households have available for spending and saving after accounting for taxes and social contributions. It focuses on the income of households within a specific region or country. It includes wages, salaries, property income, and social benefits, minus taxes and social contributions.

Gross value added (GVA)

The contribution of each industry in the economy. It is defined as output less intermediate consumption and does not include taxes and subsidies.

Intermediate consumption

The value of raw materials and other goods and services used up in the production process.

Compensation of employees

All payments in the nature of wages and salaries, whether in cash or in kind. It includes director'sfee; commissions and the value of staff benefits such as meals provided free of charge and employer contributions to any superannuation scheme. It does not include any drawings by working proprietors.

Ownership of dwellings

In the same way that a tenanted dwelling can be seen as a marketed service so can an owner-occupied dwelling be regarded as providing a service to the owner. By imputing a rent to owner- occupied dwelling, they are treated consistently with those being rented out, thus avoiding changes in the scope of production merely from change the proportion of owner-occupiedhousing. Owner-occupiers are treated like owners of tenanted dwellings: they are regarded as receiving production income from themselves while paying operating expenses.

Imputed bank service charge

Under the 1968 System of National Accounts (SNA), the gross value added of the banking sector is calculated by measuring the difference between interest receivable and interest payable. This is not specifically allocated to users of bank services but appears as a separate entry, theimputed bank service charge, as a cost against GDP. The 1993 SNA recommends specifically allocating the charges to depositors and borrowers who consume the services. The term “financial intermediation services indirectly measured” (FISIM) is adopted for these implicitcharges. Due to the difficulties involved in collecting this detailed information, the Statistics Department has no immediate plans to adopt the 1993 recommendation.

Taxes on production

Compulsory unrequited payments, in cash or kind, made to government by producers in respect of the production, sale, purchase and use of goods and services, and which producers treat as an expense of production. They are included in the values paid by purchasers in GDPE, but are not included in producer values on the supply side and are listed separately.

Subsidies on production

Grants on current account made by general government to enterprises which are credited to their production accounts. Subsidies include payments to ensure a guaranteed price or to enablemarket prices of goods and services to be held below the costs of production.

Final consumption expenditure of households

Final consumption expenditure of households is concerned with final purchases made by Tonganresident households. Conceptually it includes expenditure by Tongans overseas, and excludes expenditure by overseas tourists in Tonga. Included is expenditure on new durable (cars, household appliances etc) and non-durable goods (food, cleaning materials etc), services, and second-hand goods. Also included is an estimate for rental of owner-occupied dwellings and food and handicraft produced for own household consumption.

Final consumption expenditure of non-profit organizations serving households

The expenditure of such bodies as charities, sports clubs, and religious organisations.

Gross fixed capital formation

The outlays (acquisitions less disposals) of producers on fixed assets such as buildings, motor vehicles, plant and machinery, improvements to land, software and minerals.
Expenditure on mineral exploration was estimated for the first time in the year 2017-18 report, using the administrative data available. Inventories is also regarded as capital formation, which cover materials and supplies intended for use in production, work-in-progress, and finished goods held for sale or resale.

Change in inventories

The change in value of stocks of raw materials, work-in-progress, and finished goods, between the beginning and end of the period.

Exports and imports of goods and services

Exports include all goods and services produced by Tonga residents and purchased by the rest of the world. Exports of merchandise are valued free-on-board (fob). Imports include all goods and services produced by the rest of the world and purchased by Tongan residents. Imports of merchandise are also valued free-on-board (fob). Insurance and freight costs are included in imports of services.

As noted in the main report, TSD have adjusted merchandise trade data upwards to include MAFF volumes of vegetables exported. Analysis of the large increase in construction activity suggests that there has been some under-reporting of the imported materials required to complete the construction projects, therefore goods imports have also been adjusted upward. It should also be noted that imports are shown in the BOP and national accounts “free-on-board” (FOB) whereas merchandise trade statistics are reported as “cost including insurance and freight” (CIF).

Implicit price deflator

The ratio of nominal (current-price) GDP to the real (constant-price) measure of GDP times 100.

The residency concepts

The concept of residence is associated with that of economic territory in the national accounts. Aunit is said to be resident in a country when its “centre of economic interest” is situated in that country’s economic territory. This is usually taken to mean that the unit has carried out economic activity there for more than one year. Most firms, including unincorporated enterprises that have an activity in the territory, are regarded as resident. Actual or intended location for one year or more is used as an operational definition. While the choice of one year as a specific period is somewhat arbitrary, it is adopted to avoid uncertainty and facilitate international consistency.