



TECHNICAL ASSISTANCE REPORT

CAYMAN ISLANDS

Rebasing of Gross Domestic Product

AUGUST 2024

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Executive Summary

In response to a request from the Economics and Statistics Office (ESO) in Cayman Islands, a technical assistance (TA) mission took place between 5 August and 9 August 2024, to support the improvement and rebasing of Gross Domestic Product (GDP). The ESO intends to update the base year of the National Accounts Statistics (NAS) with the development of supply and use tables (SUT). A Household Budget Survey (HBS) for 2023 will be the major new data source introduced. As a concurrent exercise, the ESO will compile tables one to six of a Tourism Satellite Account (TSA) within the SUT.

The mission focused on the following aspects: updating the industry dimension of the SUT to the International Standard Industrial Classification, Revision 5 (ISIC); providing guidance on estimating the primary tables of a TSA within SUT; expanding the detail of the product dimension of SUT to improve estimates of gross fixed capital formation (GFCF), household final consumption expenditure (HFCE) and intermediate consumption (IC) of transportation products; and demonstrating fixed versus variable ratio backcasting.

A draft Revision 5 version of ISIC is now available. This updated ISIC is meant to compliment the upcoming System of National Accounts (SNA) Manual, 2025. The mission therefore reviewed the industry dimension of the Cayman Islands 2015 SUT against the updated ISIC. Although there are many minor changes in ISIC which the ESO should adhere to, there are more significant changes to Accommodation Services, which need to be defined in the updated SUT.

The SUT product dimension should be expanded to improve the estimation of transportation goods. Although a full analysis of the SUT product dimension was limited due to a forthcoming update of the Central Product Classification (CPC), the transportation goods product detail should be expanded. This will improve the estimation of the composition of GFCF, HFCE and IC for these products. As most of these products are imported, the International Merchandise Trade Statistics (IMTS) contain sufficient detail in the Harmonized System (HS) codes to identify the level of detail required.

To support a TSA, some of the tables should be compiled within the SUT. The mission provided training and recommendations on estimating a limited benchmark TSA as part of the rebasing process. There are issues with the detailed Balance of Payments (BOP) data which the TSA requires. There were two cases where exports of tourism products are greater than domestic production. This is not possible and highlights issues with these data. Additional information on travel expenditures is required. Nevertheless, the framework for a limited TSA has been demonstrated. Since the ESO are committed to producing a TSA, it is recommended to seek out additional capacity development (CD) assistance.

The backcasting method could be expanded to include variable ratio backcasting and a link year. The fixed ratio method which has been utilized by the ESO assumes that previously published growth rates at current and constant prices by industry are relatively high quality and should be maintained in the backcasted series, in all years before the link year. There are instances however where the annual indicator is relatively low quality and the previously published estimates of the level of value added (VA) in the previous benchmark is relatively higher quality. In those cases, a variable ratio method of backcasting is preferred. Regardless of whether a fixed ratio or variable ratio method is used, a link year should be introduced to allow the weights to vary in the historical time series.

To support progress in the above work areas, the mission proposed the following priority recommendations needed to improve estimates of GDP.

TABLE 1. Priority Recommendations

Target Date	Priority Recommendation	Responsible Institutions
December 2024	Update the industry dimension in the SUT to reflect ISIC, Rev.5, especially for Accommodation Services.	ESO
January 2025	Expand the product dimension of the SUT to improve estimation of GFCF, HFCE and IC of transportation products.	ESO
January 2025	Investigate product dimension of BOP statistics and collect information on the level and product composition of travel expenditures for the updated benchmark year.	ESO

Further details on the priority recommendations and the related actions/milestones can be found in the action plan under Detailed Technical Assessment and Recommendations.

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Acronyms and Abbreviations

BOP	Balance of Payments
CARTAC.	IMF's Caribbean Regional Technical Assistance Centre
CD	Capacity Development
CII	Change in Inventories
CPC	Central Product Classification
ESO	Economics and Statistics Office
GDP	Gross Domestic Product
GFCF	Gross Fixed Capital Formation
HBS	Household Budget Survey
HFCE	Household Final Consumption Expenditure
HS	Harmonized System
IC	Intermediate Consumption
IMTS	International Merchandise Trade Statistics
IPD	Implicit Price Deflator
ISIC	International Standard Industrial Classification
ITS	International Travel Survey
NAS	National Accounts Statistics
NSO	National Statistics Office
SNA	System of National Accounts
SUT	Supply and Use Tables
TA	Technical Assistance
TSA	Tourism Satellite Account
TVA	Tourism Value Added
VA	Value Added

I. Introduction

With support from The Caribbean Regional Technical Assistance Centre (CARTAC) the ESO compiles and releases current and constant 2015 price annual estimates of production-based GDP based on the ISIC Revision 4, expenditure-based GDP (GDP-E), and income-based GDP (GDP-I). The estimates are broadly consistent with the standards set out in the 2008 System of National Accounts (2008 SNA).

The objectives of the mission were to (i) update the industry dimension of the SUT to ISIC Revision 5; (ii) provide guidance on estimating tables one to six of the TSA within the SUT; (iii) demonstrate different backcasting techniques; and (iv) expand detail of product dimension of SUT to improve estimates of GFCF, HFCE and IC of transportation goods. These developments are considered in the following sections of this report.

II. Updating SUT Industry Dimension to ISIC, Rev. 5

The United Nations Statistical Commission have released an updated ISIC. The most recent SUT for Cayman Islands is for base year 2015, and uses ISIC, Rev. 4. A new SUT will be compiled to rebase the NAS to 2023 and will make use of the recently completed HBS. The ESO should take this opportunity to review the industry classification and make modifications to be consistent with the new ISIC version. The mission therefore assisted with this review.

There are activities which the ISIC, Rev. 5 do not provide sufficient detail. ISIC is available at a four-digit level of detail. There are activities in Cayman Islands that are sufficiently large which are more granular than a four-digit ISIC. As in ISIC, Rev. 4, additional industries should be created beneath the ISIC four-digit. For example, for the industry 'Urban and Suburban Passenger Land Transport', ISIC 4921, the ESO wish to separately identify the Public School Bus, and Private Bus components. This can be achieved by disaggregating 4921 into 4921_1 and 4921_2, which are industries 'Urban and Suburban Passenger Land Transport – Public Bus', and 'Urban and Suburban Passenger Land Transport – Private Bus', respectively. There are several industries which require this type of disaggregation.

Ensure sufficient detail is specified for any industries with a significant tourism component. It is necessary to identify tourism industries in the SUT specification. A tourism industry is one which would be significantly reduced in the absence of tourism. For example, for industry 'Other Amusement and Recreation Activities', 9329, it isn't obvious whether this fits the definition of a tourism industry. However, one could decompose this industry into the three separate activities of: 'Diving, Snorkelling and Related Activities', ISIC 9329_1, 'Activities of Night Clubs', ISIC 9329_2, and 'Operations of Beaches & Recreations Parks', ISIC 9329_3. Using knowledge of the economy, ISIC 9329_1 and ISIC 9329_3 have been identified as tourism industries, where ISIC 9329_2 is not. This is one example where further disaggregation is required for TSA compilation.

There are cases where combining ISIC is required. For example, the ESO does not have separate data on non-life insurance and reinsurance, as the same companies provide these two activities, and the financial statements cannot be decomposed. The insurance industries are therefore specified as 'Life Insurance', ISIC 6511, and 'Non-Life insurance & Reinsurance', which is ISIC 6512 and 6520 combined.

Attempt to use official ISIC codes and descriptions as much as possible. The 2015 SUT often used industry descriptions or codes which were not consistent with ISIC, Rev 4. This was done so local data users would better understand the activities in the local context. If there is a desire to maintain this, one should develop a correspondence table between the formal descriptions from the ISIC and the more user-friendly descriptions to be provided with the rebased series. Appendix I contains the recommended industry detail, using information from the 2015 SUT, requirements of the TSA, and regional nuances.

Recommendations

The ESO should:

- Disaggregate four-digit ISIC codes into more detail where appropriate data exist, and the detail is significant for the Cayman Islands economy.
- Ensure sufficient industry detail is specified to identify tourism industries.
- Combine ISIC codes when detailed data does not exist.
- Use official descriptions and codes as much as possible.
- Use the recommended industry detail in Appendix I as a guide.

III. Estimating Tables of TSA Within SUT

The mission presented the fundamentals of estimation of a TSA. The ESO is interested in developing a TSA. A previous CARTAC mission in February 2023 presented the essential elements of a TSA. This included definitions, direct versus indirect and induced tourism activity, an explanation of tables one to ten, the main data requirements, and other country experiences. The current mission extended this through providing a presentation on estimation of tables one to six of the TSA within SUT. As CD in TSA is generally beyond the scope of CARTAC activities, the mission focused on the direct TSA only. The mission made use of Statistics Canada's Manual on the Canadian Tourism Satellite Account¹. Although this manual presents the Canadian experience, it focuses on direct tourism only, and is consistent with the methods outlined in the International Recommendations for Tourism Statistics Manual 2008², from the United Nations. Finally, Statistics Canada used their Manual when providing CD to Saint Lucia in the development of their TSA. Appendix II contains the presentation provided to the ESO.

Define the scope of a tourist. There are two types of tourists. The first is a person who spends one or more nights outside of their usual environment. This is defined as a 'tourist'. The second is a person who spends less than one night outside their environment and defined as an 'excursionist'. Together, these are defined as 'visitors'. A TSA therefore is really a Tourism Visitor Account. In practice though, when we use the term 'tourists', we are also including 'excursionists'. In Cayman Islands, it is important to include 'excursionists' in the TSA as they would comprise of cruise ship visitors. The purpose of the visit must be for leisure, business and other purposes not related to the exercise of an activity remunerated from within the place visited. This is broader than the notion of "leisure travel".

Define tourism industries. A tourism industry is an industry which would operate at significantly reduced levels in the absence of direct tourism. There is no explicit notion of the term 'significant', and National Statistics Offices (NSO) have some degree of flexibility. A restriction is that the tourism activity must be direct. For example, one may believe that 'Cargo Handling' is a tourist industry. However, it does not meet the requirement of 'direct tourism'. Most of the expenditures on 'Cargo Services' is IC in the Transportation Industries rather than direct purchases by tourists. Only when the indirect and induced impacts of tourism are compiled will 'Cargo Handling' be relevant. The mission assisted the ESO using the 2015 SUT and the compilers knowledge of the economy to determine the tourism industries for the 2023 SUT. Table 3 lists these industries, which are also consistent with ISIC. Rev. 5. It also contains a list of industries that are not part of the TSA but are often mistaken to be.

¹ Statistics Canada, Income and Expenditure Accounts Technical Series, [Canadian Tourism Satellite Account Handbook](#), 2007

² United Nations, Department of Economic and Social Affairs, [International Recommendations for Tourism Statistics](#), 2008

Table 2: Tourism Industries in the 2023 SUT

Industry Code	Description	TSA
4922_1	Taxi	Yes
4922_2	Other passenger land transport	Yes
5011	Sea and coastal passenger water transport	Yes
51	Air transport	Yes
5222	Service activities incidental to water transportation	No
5223	Service activities incidental to air transportation	No
5224	Cargo handling	No
5229	Other support activities for transportation	No
5510	Hotels and similar accommodation activities	Yes
5520	Other short term accommodation activities	Yes
5590	Other accommodation n.e.c.	No
5610	Restaurants and mobile food service activities	Yes
5621	Event catering activities	No
5629	Other food service activities	No
5630	Beverage serving activities	Yes
7710	Rental and leasing of motor vehicles	Yes
791	Travel agency and tour operator activities	Yes
9121	Museum and collection activities	No
9142	Nature reserve activities	Yes
9329_1	Diving, Snorkeling and Related Activities	Yes
9329_3	Operations of Beaches & Recreations Parks	No
9690_3	Wedding & Social Event Planners	Yes

Ensure the product dimension is sufficiently detailed. The ESO will wait for the updated CPC before finalizing the 2023 SUT product dimension. The dimension should identify tourism products as much as possible. For example, Air Transport produces both Air Passenger and Air Freight Transport Services. One needs to isolate and estimate Air Passenger Transport Services as much as possible. Table 4 contains the primary products associated with each tourism industry and indicates whether it is a tourism product.

Table 3: Tourism Industries, Primary Products, and TSA Products, 2023 SUT

Product Description	Industry Description
	Taxi
Taxi Services – TSA	
	Other passenger land transport
Charters and Excursions – TSA	
Limo Services – TSA	
	Sea and coastal passenger water transport
Water Passenger Transport – TSA	
	Air transport
Air Passenger Transport – TSA	
Air Freight Transport - Not TSA	
	Hotels and similar accommodation activities
Accommodation services – TSA	
	Other short term accommodation activities
Accommodation services – TSA	
	Restaurants and mobile food service activities
Direct Food and Beverages Services – TSA	
Catering of Food and Beverages - Not TSA	
	Beverage serving activities
Direct Food and Beverages Services – TSA	
	Rental and leasing of motor vehicles
Rental of vehicles – TSA	
	Travel agency and tour operator activities
Travel agencies and tour operators – TSA	
	Museum and collection activities
Museums – Not TSA	
	Nature Reserve Activities
Nature Reserve Activities-TSA	Diving, Snorkeling and Related Activities
Diving, Snorkeling and Related Activities – TSA	
	Operations of Beaches & Recreations Parks
Operations of Beaches & Recreations Parks – Not TSA	
	Wedding & Social Event Planners
Wedding & Social Event Planning – TSA	

Estimating domestic tourism supply. For each of the tourism industries, output, IC, and VA must be compiled within the SUT. The sources and methods used are really not different than those currently being utilized in the annual GDP compilation. A potential issue could be the composition of output for tourism industries which have a tourist and non-tourist component. In Table 4, these are Air Transport, and Restaurants and Mobile Food Service Activities. It is unlikely the ESO will be able to estimate this without additional data sources. Rather, these will be estimated through the product balancing reconciliation.

Estimating tourism demand. There are three types of tourism demand, with each corresponding to a specific table in the TSA. Table 1 is inbound tourism demand. These expenditures should be incorporated in the BOP statistics and be recorded as an export in the SUT. An International Travel Survey (ITS) should be conducted which provides the total expenditure and the details which correspond to the TSA products in Table 4. In practice, obtaining total expenditures and a breakdown between Air Transportation Services, Other

Transportation Services, Accommodation Services, Food and Beverage Services, Travel and Tour Operators, and Recreational Services is more common. It is the intention of the Department of Tourism to conduct this survey to support the TSA and BOP. Whatever the level of detail is in the survey, it will need to be allocated over the TSA products in Table 4 and recorded as an export. Table 2 of the TSA is domestic tourism demand. For simplicity, the ESO will assume this is insignificant, and initialize it at zero. This is the same method being used in the TSA of Saint Lucia. Table 3 is outbound tourism demand. This information is to be contained in the HBS and should be recorded as an import.

Balancing tourism products in 2023 SUT. The balancing of the tourism products follows the best practices of product balancing in general. Data which are considered relatively high quality are not adjusted in the process. The ESO will need to assess that quality. An added complexity of tourism products is that they have both a tourism and non-tourism component. Consider the product 'Taxi Services' produced by the 'Taxi' industry. Although the ESO has determined that the Taxi industry meets the requirements to be defined as a tourism industry, less than 100 percent of expenditures on Taxi Services are tourism related. It is necessary to determine this composition when producing Tourism Value Added (TSA) by industry. Table 5 illustrates to compilation borrowing from the 2015 SUT.

Table 4: Taxi Services from 2015 SUT

SUT Category	(CI\$'000)
Domestic Production - Taxi Industry	10025
Imports	742
Taxes less Subsidies	0
Total Supply at Purchaser Prices	10767
Intermediate Consumption	0
Exports	8933
HFCE	1834
Total Demand and at Purchaser Prices	10767
Tourism Expenditure	8933
Commodity Ratio	0.89

Tourism expenditure will rely on export estimates. The production of taxi services used in the National Accounts Survey, HFCE was determined through the HBS, while international trade made use of BOP. In the balancing process the international trade estimates are generally considered relatively high quality, and any product imbalance could be address with adjustments to output and HFCE (within reason). This highlights the importance of improving BOP with a detailed ITS. From the balanced product we see 89 percent of domestic production is used by tourism activity Table 5 shows how the tourism commodity ratio is calculated. In this example, the total domestic production of taxi services is 10,025 CI\$'000 at basic prices. Taxes are added (which are zero in this example) to convert from basic prices to purchaser prices, thereby matching the valuation used for demand. Thus, at purchaser prices, domestic supply of "taxi services" remains 10,025 CI\$'000, while tourism spending on 'taxi services' 8,933 CI\$'000. The tourism commodity ratio, the ratio of the demand to the supply can be calculated. In this example, the ratio is 89%. Although to be precise, a further decomposition of the exports is required since a small portion of exports are not tourism related (airplane crew, etc.). This commodity ratio can then be used to estimate tourism value added (TVA) for the Taxi Industry as illustrated in Table 6, borrowing from the 2015 SUT.

Table 5: Taxi Industry Tourism Value Added from 2015 SUT

	(CI\$'000)
Production	10025
Intermediate Consumption	3391
Value Added	6634
Commodity Ratio	0.89
Tourism Value Added	5904

TVA by industry requires commodity ratios. As illustrated in Table 6, one needs to calculate commodity ratios for each of the tourism products. For tourism industries with production of non-tourism commodities (Air Transportation, Food and Beverage Services), the commodity ratio is only calculated for the tourism component. To compile TVA for these industries, only the proportion of VA associated with the tourism product is used. One can assume (in the absence of other information) that VA to output ratios are the same for tourism and non-tourism products. Table 7 illustrates this compilation for Air Transportation using fictitious data, and a commodity ratio of Passenger Air Transportation of 0.90.

Table 6: Air Transportation, Tourism Value Added

	(CI\$'000)
Production	15000
Passenger Transportation	10000
Freight Transportation	5000
Intermediate Consumption	10000
Value Added (1)	5000
Proportion of Value Added - Passenger Transportation (2)	0.67
Commodity Ratio - Passenger Transportation (3)	0.90
Tourism Value Added (1 * 2 * 3)	3000

Compiling Tourism GDP. TVA needs to be compiled for each of the tourism industries using the methods illustrated in Tables 5, 6 and 7. To compile tourism GDP, taxes less subsidies on products for the tourism products needs to be introduced. For each of the tourism products, one needs to compile the taxes less subsidies that are allocated to tourism. In this case, the commodity ratio for each tourism product can be used.

Likely errors were discovered for tourism products in the 2015 SUT. When demonstrating the compilation of commodity ratios, the mission discovered instances where the exports were greater than the domestic production. This is unlikely in the case of trade in services, as re-exports are not common. Under these cases, the commodity ratio is greater than 1. When balancing the tourism commodities (and service commodities in general), one should investigate the ratio of exports relative to domestic production. Table 8 illustrates this for Water Passenger Transport.

Table 7: Water Passenger Transport 2015 SUT

SUT Category	(CI\$'000)
Domestic Production	15449
Imports	1238
Taxes less Subsidies	0
Total Supply at Purchaser Prices	16688
Intermediate Consumption	0
Exports	15775
HFCE	912
Total Demand and at Purchaser Prices	16688
Tourism Expenditure	15775
Commodity Ratio	1.02

Further Capacity Development is recommended. The ESO are motivated to produce a TSA as part of GDP rebasing, including estimates of the indirect and induced effects. It is recommended to seek additional CD, beyond the fundamentals of estimation delivered in this mission.

Recommendations

The ESO should:

- Ensure excursionists are included in the TSA and part of the data collection process.
- When identifying tourist industries, use the list in Table 2 as a guide.
- Isolate tourism commodities as much as possible when developing SUT product classification.
- Seek additional data sources such as an ITS to estimate tourism demand.
- Compile commodity ratios as a method to determine Tourism Value Added by Industry.
- Investigate services commodities in the 2015 SUT which contain an export to domestic supply ratio which is greater than one.

IV. Backcasting Methods

Introduce a link year. When the ESO rebase to 2023 the updated estimates will be backcasted to at least the previous base year. In the previous rebasing a fixed ratio backcasting method was used. The 2015 SUT resulted in a level revision to VA by industry, relative to the previously published level. To backcast the series, the previously published growth rates at constant prices were maintained. An issue with this approach is that the same weights are imposed on the entire historical series. An introduction of a link year addresses this problem. A link year could be chosen as the mid-year between the previous and updated base year. In this case, the link year could be 2019. From 2020 to 2022 (or the most recent annual publication year) the series is recompiled with updated source data, SUT, methodology, etc. Commencing between 2019 and 2020 the backcasting occurs.

Consider introducing variable ratio backcasting for certain industries. Using fixed ratio backcasting is a common practice for the period before the link year. There are instances though when it can be improved. Consider the industry of personal services. The 2015 SUT estimates made use of the HBS at that time to reconcile output estimates of personal services. The resulting output and VA are therefore considered high quality. Between 2015 and 2023 an annual indicator extrapolated VA. This indicator is often population growth. 2023 will feature a new HBS in the SUT, and a level revision to the VA of personal services may occur. The level of VA in both the 2015 and 2023 SUT are most likely a more accurate measure of VA than the one derived using the growth in population. As in fixed ratio backcasting, the 2020 to 2022 will need to be recompiled. However, commencing in 2019, the revised level of VA at current prices is wedged back to 2015 in a manner which emulates the previously published series as much as possible, while producing no revision in 2015. At constant prices, one can use the previously published implicit price deflators (IPD) re-referenced to 2023 to convert from current to constant prices. Appendix III contains the presentation on these methods including the formula for variable ratio backcasting. Table 9 illustrates the methods for a single series.

Recommendations

The ESO should:

- Introduce a Link year in the backcasting exercise.
- Consider using variable ratio backcasting for certain industries.

Table 8: Demonstration of Backcasting Methods

Industry	2015	2016	2017	2018	2019	2020	2021	2022	2023
					Link Year				
Value Added - Current Prices - Base Year 2015	15449	15681	15994	16474	16804	16804	17224	17741	18628
Value Added - Constant Prices - Base Year 2015	15449	15635	15791	16107	16429	16478	16643	16976	17485
Implicit Price Deflator (2015)	100	100	101	102	102	102	103	105	107
									SUT 2023
							Recompiled		
Value Added - Current Prices - Base Year 2023						17594	18137	18578	19559
Value Added - Constant Prices - Base Year 2023						18358	18643	18964	19559
Method 1) Fixed Ratio									
Value Added - Current Prices - Base Year 2023	16176	16418	16747	17249	17594				
Value Added - Constant Prices - Base Year 2023	17212	17418	17592	17944	18303				
% Revision - Current Prices	4.70	4.70	4.70	4.70	4.70	4.70	5.30	4.72	5.00
% Revision - Constant Prices	11.41	11.41	11.41	11.41	11.41	11.41	12.01	11.71	11.86
Method 2) Variable Ratio									
Value Added - Current Prices - Base Year 2023	15449	15826	16291	16935	17433				
Implicit Price Deflator, Re-Referenced to 2023	93.9	94.1	95.1	96.0	96.0				
Value Added - Constant Prices - Base Year 2023	16459	16810	17135	17639	18158				
% Revision - Current Prices	0.00	0.92	1.86	2.80	3.75	4.70	5.30	4.72	5.00
% Revision - Constant Prices	6.53	7.52	8.51	9.51	10.53	11.41	12.01	11.71	11.86

Section V. Detailed Technical Assessment and Recommendations

Table 9: Detailed Technical Assessment

Priority	Action/Milestone	Target Completion Date	Actual completion date
Objective: Strengthen compilation and dissemination of National Production, Income and Expenditure Accounts.			
Outcome: New benchmarks have been developed aligned to international statistical standards and using the latest most comprehensive source data available			
M	Develop and release a new Vintage of Supply and Use Tables	12/31/2026	On-going
M	Update- GDP backcasted results and publish	12/31/2026	On-going
M	Finalize 2023 SUT	6/30/2026	On-going

Table 10: Summary of Recommendations

Priority	Recommendation	Target Completion Date
H	Update the industry dimension in the SUT to reflect ISIC, Rev.5, especially for Accommodation Services.	December 2024
H	Expand the product dimension of the SUT to improve estimation of GFCF, HFCE and IC of transportation products.	January 2025
H	Investigate product dimension of BOP statistics and collect information on the level and product composition of travel expenditures for the updated benchmark year.	January 2025
M	Disaggregate four-digit ISIC codes into more detail where appropriate data exist, and the detail is significant for the Cayman Islands economy.	December 2024
H	Ensure sufficient industry detail is specified to identify tourism industries.	December 2024
M	Combine ISIC codes when detailed data does not exist.	December 2024
M	Use official descriptions and codes as much as possible.	December 2024
H	Use the recommended industry detail in Appendix I as a guide.	December 2024
H	Initialize values of GFCF of 'Motor Vehicles', and 'Other Transport Equipment' using international imports for the specified HS codes as illustrated in Table 2.	January 2025
H	For the four-digit HS codes which contain both GFCF and HFCE, use the HBS to estimate HFCE, and GFCF (and CII) will be the SUT balancing item.	June 2025

Priority	Recommendation	Target Completion Date
H	Ensure excursionists are included in the TSA and part of the data collection process.	January 2025
H	When identifying tourist industries, use the list in Table 3 as a guide.	January 2025
H	Isolate tourism commodities as much as possible when developing SUT product classification.	January 2025
H	Seek additional data sources such as an ITS from the Department of Tourism to estimate tourism demand.	December 2024
H	Compile commodity ratios as a method to determine Tourism Value Added by Industry.	December 2026
H	Investigate services commodities in the 2015 SUT which contain an export to domestic supply ratio which is greater than one.	July 2025
H	Introduce a Link year in the backcasting exercise.	January 2026
H	Consider using variable ratio backcasting for certain industries.	January 2026

Section VI. List of Officials Met During the Mission

Name	Institution
Mr. Selburn Christian	<i>Economics and Statistics Office</i>
Mr. Adolphus Laidlow	<i>Economics and Statistics Office</i>
Mr. Ralston Henry	<i>Economics and Statistics Office</i>
Mr. Joseph Anderson	<i>Economics and Statistics Office</i>
Mr. O'Dayne Plummer	<i>Economics and Statistics Office</i>
Ms. Francine Wright	<i>Economics and Statistics Office</i>

Appendices

Appendix I: Recommended Industry Detail for 2023 SUT

ISIC Code	Title
0113	Growing of vegetables and melons, roots and tubers
0119	Growing of other non-perennial crops
014	Animal production
031	Fishing
B	Mining and quarrying
1010	Processing and preserving of meat
1071	Manufacture of bakery products
1103	Manufacture of beer
1105	Manufacture of soft drinks; production of mineral waters and other bottled waters
1400	Manufacture of wearing apparel
22	Manufacture of rubber and plastic products
2395	Manufacture of articles of concrete, cement and plaster
2399	Manufacture of other non-metallic mineral products n.e.c.
310	Manufacture of furniture
32	Other manufacturing
33	Repair, maintenance and installation of machinery and equipment
35	Electricity, gas, steam and air conditioning supply
3600	Water collection, treatment and supply
3700 & 3800	Sewerage, Waste collection, treatment and disposal, and recovery activities
4100	Construction of residential and non-residential buildings
421	Construction of roads and railways
4220 & 4290	Construction of utility projects and Construction of other civil engineering projects
43	Specialized construction activities
G	Wholesale and retail trade
4921_1	Urban and suburban passenger land transport - Public Bus Services
4921_2	Urban and suburban passenger land transport - School Bus Services
4922_1	Taxi
4922_2	Other passenger land transport
4923	Freight transport by road
5011	Sea and coastal passenger water transport
5012	Sea and coastal freight water transport
51	Air transport
5222	Service activities incidental to water transportation
5223	Service activities incidental to air transportation
5224	Cargo handling
5229	Other support activities for transportation
5310	Postal activities
532	Courier activities

5510	Hotels and similar accommodation activities
5520	Other short term accommodation activities
5590	Other accommodation n.e.c.
5610	Restaurants and mobile food service activities
5621	Event catering activities
5629	Other food service activities
5630	Beverage serving activities
581	Publishing of books, newspapers, periodicals and other publishing activities
59	Motion picture, video and television programme production
60	Programming, broadcasting, news agency and other content distribution activities
61	Telecommunications
62	Computer programming, consultancy and related activities
6411	Central banking
6419_1	Commercial Retail/Non-Retail Banks
6419_2	Class B banks with physical presence
6419_3	Class B banks without physical presence
6419_4	Building Societies
6419_5	Credit Unions
6419_6	Remittance services
643	Activities of trusts, funds and similar financial entities
6495_1	Other credit granting activities - Development Bank
6495_2	Other credit granting activities – Institutions
6511	Life insurance
6512 & 6520	Non-life insurance & Reinsurance
6530	Pension funding
6611	Administration of financial markets
6612	Security and commodity contracts brokerage
6619	Other activities auxiliary to financial service activities, except insurance and pension funding
6622	Activities of insurance agents and brokers
6629	Other activities auxiliary to insurance and pension funding
6630	Fund management activities
6810_1	Renting of dwellings
6810_2	Owner- occupied dwellings
6810_3	Renting of commercial property
6829	Other real estate activities on a fee or contract basis
6910	Legal activities
6920	Accounting, bookkeeping and auditing activities; tax consultancy
7020	Business and other management consultancy activities
7110	Architectural and engineering, and related technical consultancy activities
7310	Advertising activities
7410	Specialized design activities
7420	Photographic activities
7500	Veterinary activities
7710	Rental and leasing of motor vehicles
772	Rental and leasing of personal and household goods

7730	Rental and leasing of other machinery, equipment and tangible goods
7810	Activities of employment placement agencies
791	Travel agency and tour operator activities
80	Investigation and security activities
812	Cleaning activities
8130	Landscape service activities
8210	Office administrative and support activities
8411	General public administration activities
8412	Regulation of the activities of providing health care, education, and other social services
8421	Foreign affairs
8422	Defence activities
8423_1	Public order and safety activities – Police
8423_2	Public order and safety activities – Fire
8510	Pre-primary education
8520_1	Primary education – Public
8520_2	Primary education – Private
8531_1	Public secondary schools
8531_2	Private secondary schools
8531_3	Public special education
8532	Vocational secondary education
8540_1	Tertiary education – Public
8540_2	Tertiary education – Private
855	Other education
8610_1	Hospital activities – Public
8610_2	Hospital activities – Private
8620	Medical and dental practice activities
8710	Residential nursing care activities
8720	Residential care activities for persons living with a mental illness or substance abuse
879	Other residential care activities
88	Social work activities without accommodation
90	Arts creation and performing arts activities
911	Library and archive activities
9121	Museum and collection activities
9122	Historical site and monument activities
9141	Botanical and zoological garden activities
9142	Nature reserve activities
9200	Gambling and betting activities
9311	Operation of sports facilities
9312	Activities of sports clubs
9329_1	Diving, Snorkeling and Related Activities
9329_2	Activities of Night Clubs
9329_3	Operations of Beaches & Recreations Parks
9411	Activities of business and employers membership organizations
9412	Activities of professional membership organizations
9491	Activities of religious organizations

9499	Activities of other membership organizations n.e.c.
95	Repair and maintenance of computers, personal and household goods, and motor vehicles
9610	Washing and cleaning of textile and fur products
962	Hairdressing, beauty treatment, day spa and similar activities
9630	Funeral and related activities
9690_1	Spas, Massage & Tattoo Parlours, etc.
9690_2	Pet Care Service Activities
9690_3	Wedding & Social Event Planners
9690_4	Other Service Activities
U	Activities of households as employers

Backcasting Methods

- ❖ Fixed ratio splicing;
 - ❖ "Proportional approach" in which conversion coefficients are compiled at the most detailed possible level of aggregates using the common year data of these variables.
 - ❖ These coefficients are then applied on the old series (both at current and constant prices) to form a time series that is consistent with the new series.
 - ❖ This method is equivalent to applying the growth rate of the old time series to the revised levels of the new series, for each variable being backcast.

Backcasting Methods

- ❖ Steps.
- ❖ 1) Identify the detailed levels of activities, products and aggregates that would be covered in the fixed ratio splicing exercise.
- ❖ 2) Prepare concordance tables based on conversion coefficients for each detailed level identified for backcasting.
 - ❖ The conversion coefficient is calculated as new series value in the base year (which is also the common year between the two series) divided by the old series value.
 - ❖ The current and constant price values are same for the base year. Therefore, same data are used for compiling coefficients separately for backcasting current and constant price values in the old series.
 - ❖ For improving the quality of the conversion coefficients it is recommended to extend the period of double coding, for instance by another year, in order to give the new classification time to settle down, and to have the coefficients calculated on the basis of data which has already undergone some corrections.

Backcasting Methods

- ❖ Steps.
- ❖ 3) Apply the conversion coefficients on the old series data, at most detailed level to obtain a consistent time series of national accounts.

Year 2010 is the year to calculate conversion ratio

-Ratio of values at splice point=110/105=1.04

	2006	2007	2008	2009	2010	2011	2012
Output of economic activity 1 -New (2010-12)					110	123	138
Output of economic activity 1 -Old	60	75	85	94	105	117	134
GR of Output of economic activity 1 -Old		25.0	13.3	10.6	11.7	11.4	14.5
Output of economic activity 1 -New (2006-12)	63	79	89	98	110	123	138
GR of Output of economic activity 1 -New (2006-12)		25.0	13.3	10.6	11.7	11.8	12.2

Backcasting Methods

- ❖ When to apply fixed ratio splicing.
 - ❖ 1) It has been determined that recompilation is not possible or not defensible.
 - ❖ 2) It is believed that the difference in aggregates computed in the SUT apply **in equal magnitude** to all years in past and previously published growth rates remain correct.
 - ❖ EX; 2013 base year estimates used a SUT and a survey of **large** wholesale/retailer businesses to estimate value added for distributive trade.
 - ❖ VA was subsequently extrapolated using GST/VAT.
 - ❖ 2017 base year estimates used a SUT and an economic census. SUT gave a VA estimate of 10% higher than previously published.
 - ❖ 2013 series most likely underestimated VA in **all** years at roughly the same magnitude due to poorer coverage.
 - ❖ Fixed ratio splicing is appropriate.
 - ❖ VAT/GST was still a reliable indicator of growth.

Backcasting Methods

- ❖ Variable ratio splicing (wedging);
 - ❖ Use when recompilation is not possible AND, no conceptual reason to believe old base year level was incorrect.
 - ❖ The new level in the new base year is tapered/wedged back through time so that at some point (usually the previous year) the values are identical.
 - ❖ Technically more advanced than fixed ratio splicing.
 - ❖ An infinite number of methods to taper/wedge (will present the most common method).
 - ❖ Yet, a defensible backcasting exercise will almost always contain some series with variable ratio splicing (you need to know how to implement it).

Variable ratio splicing

- instead of a fixed factor (as in historical series indicator), factor starts at one and move towards the factor at splice point

	2006	2007	2008	2009	2010	2011	2012
Output of economic activity 1 - New (2010 -12)					110	123	138
Output of economic activity 1 - Old	60	75	85	94	105	117	134
GR of Output of economic activity 1 - Old		25.0	13.3	10.6	11.7	11.4	14.5
Factor	1	1.0119	1.0238	1.0357	1.0476		
Output of economic activity 1 - New (2006 -12)	60	75.9	87.0	97.4	110	123	138
GR of Output of economic activity 1 - New (2006 -12)		26.5	14.7	11.9	13.0	11.8	12.2

Backcasting Methods

- ❖ Variable ratio splicing - technicalities;
- ❖ Most common method;
- ❖ Wedge the new base year level back to the old base year so that the values are identical.

	2013	2014	2015	2016	2017
Old Base	12000	13000	13500	13300	14000
New Base from SUT	12000	X	Y	Z	15000

Need to derive values for X, Y and Z.

Backcasting Methods

- ❖ Standard Formula;
- ❖ Step 1) Derive Annual Adjustment (AA) - Fixed.
 - ❖ $AA = (\text{New Base value} / \text{Old Base Value}) ^ {1 / (\text{Number of years} - 1)}$
- ❖ Step 2) Derive Adjustment Factor (AF) – Variable for each year.
 - ❖ $AF = (AA) ^ {(\text{Number of years since old base year})}$
- ❖ Step 3) Derive Adjustment Factor (AF) – Variable for each year.
 - ❖ $\text{New Value} = \text{Old Value} * AF$

Backcasting Methods

	2013	2014	2015	2016	2017
Old Base	12000	13000	13500	13300	14000
New Base from SUT	12000 X	Y	Z		15000

- ❖ $AA = (\text{New Base value} / \text{Old Base Value}) ^ {1 / (\text{Number of years} - 1)}$
- ❖ $= (15,000 / 14,000) ^ {1 / 4} = 1.0174$
- ❖ $AF = (AA) ^ {(\text{Number of years since old base year})}$
- ❖ $AF(2013) = 1.0174 ^ 0 = 1$, $AF(2014) = 1.0174 ^ 1 = 1.0174$
- ❖ $AF(2015) = 1.0174 ^ 2 = 1.0351$, $AF(2016) = 1.0174 ^ 3 = 1.0531$
- ❖ $AF(2017) = 1.0174 ^ 4 = 1.0714$
- ❖ $\text{New Value (NV)} = \text{Old Value} * AF$
- ❖ $NV_{2013} = 12000 * 1 = 12000$, $NV_{2014} = 13000 * 1.0174 = 13226$
- ❖ $NV_{2015} = 13500 * 1.0351 = 13974$, $NV_{2016} = 13300 * 1.0531 = 14006$
- ❖ $NV_{2017} = 14000 * 1.0714 = 15000$

Backcasting Methods

	2013	2014	2015	2016	2017
Old Base	12000	13000	13500	13300	14000
Growth		8.3	3.8	-1.5	5.3
New Base	12000	13226	13974	14006	15000
Growth		10.2	5.7	0.2	7.1

- ❖ Major implication of this method;
 - ❖ Most revision tend to be positive.
 - ❖ Therefore, this method normally produces higher backcasted growth rates.