

# Measuring the Cayman Islands' Gross Domestic Product through the Income Approach

## 1. Introduction

In 2009, the Economics and Statistics Office (ESO) released the results of the first-ever compilation of the System of National Accounts (SNA) in the Cayman Islands which presented the Gross Domestic Product (GDP) for the years 2006 and 2007. GDP is the total value added of goods and services produced in an economy within a specified period of time, usually a month, a quarter or a year. The GDP along with its associate measures such as per capita GDP remain the primary indicators of economic performance and well-being of a country.

The SNA identifies three alternative ways of measuring GDP: a) the expenditure approach, i.e. by summing up expenditures for consumption, physical investment, and net trade; b) the production approach, i.e. by summing up the value added of all local industries; and c) the income approach which is discussed in this paper. The 2009 SNA report presented the GDP calculation using the production approach.

The income approach measures GDP as the sum of all income accruing to the factors of production. GDP is calculated as sum of the compensation of employees, operating surplus, consumption of fixed capital and taxes on production and imports less subsidies on production and imports. That is,

$$\begin{aligned} \text{GDP} = & \\ & \text{Compensation of Employees} \\ & + \text{Consumption of Fixed Capital} \\ & + \text{Operating Surplus} \\ & + \text{Taxes on production and imports} \\ & - \text{Subsidies on production and imports} \end{aligned}$$

The definitions used in calculating each of the above are discussed in Section 2 of this report. The results of the calculation are presented in Section 3.

## 2. Methodology and Definitions

**2.1 Compensation of employees.** This is defined as the total remuneration, in cash and kind, paid by employers to employees for work done during the accounting period. Compensation has two components:

1. Gross wages and salaries
2. Employers' social contributions

### 2.1a Gross wages and salaries

This is defined to include all payments which employees receive in respect of their work. Included are:

- (a) Commissions, tips, bonuses and gratuities;
- (b) Allowances such as housing, uniform and travelling;

- (c) Wages paid during vacation and sick leave;
- (d) Overtime payments; and
- (e) Wages and salaries in kind.

The following items are among the consumption goods and services provided by the employer to the employee without charge or at a markedly reduced cost, which are of clear and direct benefit to the employees as consumers and are therefore included as part of wages and salaries:

- (a) Meal and drinks;
- (b) Housing services that can be used by all members of the household;
- (c) Uniforms that employees choose to wear frequently outside of the workplace as well as at work;
- (d) Sports, recreation and holiday facilities for employees and their families;
- (e) Transportation to and from work, car parking; and
- (f) Nurseries for the children of employees.

#### 2.1b Employers' social contribution

This includes contributions paid by employers on behalf of their employees to social security schemes, private pension funds and insurances schemes. These are geared towards providing benefits for the employees in the event that circumstances affect their ability to earn income, such as sickness, accidents, redundancy, retirement etc. These social contributions may be actual or imputed.

- Employers' actual social contributions - These consists of social contributions paid directly by employers for the benefit of their employees to social security funds, insurance enterprises or other instituted units responsible for the administration and management of social insurance schemes.
- Employers' imputed social contributions - Some employers provide social benefits directly to their employees or dependents out of their resources without the use of an insurance enterprise or special pension fund. Remuneration should therefore be imputed equal in value to the amount of social contributions that would be needed to secure the entitlement.

#### 2.3 Consumption of Fixed Capital

This is the cost of production associated with the decline in the value of fixed assets used in the production process. It can be viewed in general terms as the replacement cost of the fixed assets used up in the process of production.

The SNA recommends that this be valued using the actual or estimated prices of fixed assets prevailing at the time the production takes place but not the prices at the time the fixed asset was originally acquired. However, in the case of the Cayman Islands depreciation is used as the indicator for consumption of fixed capital.

## **2.4 Taxes less subsidies on production and imports**

Taxes are compulsory, unrequited payments made to government by other institutional units. Taxes are said to be unrequited because the government does not directly provide a specific good or service in return for the payments made. There are two types of taxes on production and imports:

a. Taxes on products are taxes on goods and services that become payable when the goods are produced, sold, imported or otherwise disposed of by their producers. The following are categories of this type of tax:

- a) Taxes and duties on import
- b) Other taxes on product excluding taxes and duties on import (e.g. hotel occupancy tax).

b. Other taxes on production are all taxes excluding taxes on products that establishments incur as a result of engaging in production (e.g. business and professional licences, property tax, stamp duties).

## **2.5 Subsidies on production and imports**

It should be noted that in the Cayman Islands, subsidies as defined by SNA are negligible.

Subsidies are current unrequited transfers that government makes to resident producers and importers. These transfers or payments are based on the levels of production and/or the quantity and value of goods and services produced, imported or sold. Subsidies are seen as negative taxation as producers receive them rather than pay them. There are two types of subsidies on production and imports:

1. Subsidies on products – subsidies payable per unit of a good or service e.g. fertilizer sold to farmers;
2. Other subsidies on production - subsidies excluding subsidies on products that are paid to resident establishments as a result of engaging in production.

## **2.6 Operating surplus/mixed income**

Operating surplus/mixed income is the income accruing to the production process before deducting interest charges, rent or property incomes payable. It is equivalent to the excess of the value added over the sum of the compensation of employers, net taxes on production, and allowances for the consumption of fixed capital.

That is,

Operating Surplus = Gross Value Added – (Compensation of Employees + net Taxes on Production and Imports + allowance for the Consumption of Fixed Capital)

### 3. Results of GDP Calculation at Current Market Prices by Income

#### 3.1 Value and Contribution to GDP

The Cayman Islands' Gross Domestic Product (GDP) at current market prices stood at \$2,778.5 million in 2007. The breakdown of GDP by income type is presented in Tables 1a and 1b.

**Table 1a GROSS DOMESTIC PRODUCT BY INCOME AT CURRENT PRICES (CI\$000)**

Type of Income	2006	2007
Compensation of Employees	1,259,304.6	1,373,700.6
Operating Surplus\Mixed Income	852,182.4	894,187.8
Consumption of Fixed Capital	130,297.4	149,524.7
Taxes <i>less</i> Subsidies on Production and Imports	369,461.6	361,122.9
<b>Gross Domestic Product at Market Prices</b>	<b>2,611,246.0</b>	<b>2,778,536.0</b>

**Table 1b PERCENTAGE CONTRIBUTION TO GROSS DOMESTIC PRODUCT AT CURRENT MARKET PRICES BY INCOME**

Type of Income	2006	2007
Compensation of Employees	48.2	49.4
Operating Surplus\Mixed Income	32.6	32.2
Consumption of Fixed Capital	5.0	5.4
Taxes <i>less</i> Subsidies on Production and Imports	14.1	13.0
<b>Gross Domestic Product at Market Prices</b>	<b>100.0</b>	<b>100.0</b>

The Cayman Islands is a service-oriented economy which relies heavily on labour. The estimation of GDP by income type shows the relative importance of labour as a factor of production relative to physical capital and equity.

As shown in Tables 1a – 1b the largest contribution to GDP by type of income was compensation of employees which was valued at \$1,373.7 million in 2007 accounting for 49.4 percent of total GDP. The second largest contribution (32.2%) came from operating surplus/mixed income with a total value of \$894.19 million in 2007. Contribution from taxes net of subsidies on production and imports amounted to \$361.1 million or 13.0 percent of GDP. Finally, the small share of fixed capital consumption (5.4%) suggests the relatively low usage of physical capital including industrial machinery and other types of fixed asset in domestic production and is consistent with a service oriented economy.

### 3.2 Contribution to GDP Growth in 2007

Economic performance is normally described in terms of GDP growth. Categorizing the GDP components by income thus allow the analysis of the sources of growth in a similar fashion. This exercise was based on data derived from the 2006-2007 Annual National Accounts Survey conducted in 2008. The survey covered the economic activity of all industries in the Cayman Islands in 2006 and 2007. The survey was also supplemented by administrative records and other secondary data from the central government, regulatory and statutory authorities.

In 2007, GDP valued at current market prices grew by 6.4 percent over the previous year's level. All the categories of income, except net taxes on production and imports, contributed to this growth as shown in Table 2 below.

**Table 2 PERCENTAGE GROWTH OF GROSS DOMESTIC PRODUCT  
AT CURRENT MARKET PRICES BY INCOME, 2007**

<b>Type of Income</b>	<b>% Growth</b>
<b>Compensation of Employees</b>	<b>9.1</b>
<b>Operating Surplus/Mixed Income</b>	<b>4.9</b>
<b>Consumption of Fixed Capital</b>	<b>14.8</b>
<b>Taxes less Subsidies on Production and Imports</b>	<b>(2.3)</b>
<b>Gross Domestic Product at Market Prices</b>	<b>6.4</b>

Total compensation of employees (9.1%), operating surplus (4.9 %) and consumption of fixed capital (14.8 %) all grew. However, net taxes on production and imports fell by 2.3 percent. Contributing to the fall in net taxes on production and imports are the decline of 4.3 percent in import duties resulting from a fall in the value of imports of goods, and the decline in number of cruise passenger arrivals.

Growth in total compensation of employees can be traced to growth in employment or/and growth in the average compensation. The year 2007 saw an increase of 2.8 percent in the number of persons employed over the previous year. There was also increase in wage rates among some industries. For example, the public sector saw an increase of 3.2 in wage rate as it sought to keep employees' pay in line with the rate of inflation.

### 3.3 Compensation of Employees

Table 3 shows the breakdown of total compensation in the Cayman Islands for 2006 and 2007 by industry. (This classification is based on the International Standard Industrial Classification Revision 3.1).

Table 3 COMPENSATION OF EMPLOYEES (CI\$000)

Industry	2006	2007
Agriculture	4,267.2	5,087.5
Fishing	435.9	479.0
Mining & Quarrying	16,514.6	17,493.3
Manufacture	13,252.3	14,745.7
Electricity & Water Supply	25,976.0	27,625.0
Construction	90,410.3	90,348.8
Wholesale & Retail Trade, Repairs & Installation of Machinery	92,351.7	91,180.3
Hotels & Restaurants (incl Bars)	52,123.4	56,208.6
Transport, Storage & Communication	84,031.5	89,922.8
Financing & Insurance Services	348,375.2	387,884.7
Real Estate, Renting & Business Activities	227,888.4	257,458.6
Public Administration and Defense	145,933.6	162,007.7
Education Services	51,009.2	57,276.3
Health and Social Work	56,612.3	60,189.8
Other Services	50,123.0	55,792.6
<b>TOTAL</b>	<b>1,259,304.6</b>	<b>1,373,700.6</b>

As shown above, these industries recorded over half of all compensation in the country in 2006 – 2007 these are:

- Financing and Insurance Services with \$387.9 million in compensation or 28.2 percent of the total compensation in 2007;
- Real Estate, Renting and Businesses activities with \$257.5 million in compensation or 18.7 percent of total compensation in 2007; and
- Public administration and defense with \$162.0 million in compensation or 11.8 percent of total compensation in 2007.

It may be noted that financing and insurance services was the fifth largest employer in Cayman in 2007 with a share of 9.5 percent of total employment. Meanwhile, real estate, renting and business activity was the second largest employer with 12 percent of the total employment. The fact that the shares of these industries in total compensation are

higher than their share to total employment suggests that average compensation in these industries are also higher than the overall average compensation in the country.

The construction industry is perennially the largest employer of labour in Cayman. In 2007, it employed 5,646 persons or 16.1 percent of total employment. In terms of compensation, the calculated value from this industry amounted to \$90.3 million in 2007 or only 6.6 percent of total compensation. The relatively small share is, however, not surprising since labour cost in the construction industry is generally lower relative to the financing and insurance industry and other high-paying industries. This industry has also the highest percent of unskilled and semi-skilled labour.

Based on the 2007 Labour Force Survey, wholesale and retail trade, and hotels and restaurants are also among the top five industries in terms of employment. Wholesale and retail trade employed 3,619 jobs in 2007 (or 10.3 % of total) while hotels and restaurants had 3,499 (or 10% of total). Calculated compensation for these industries amounted to \$91.2 million for wholesale and retail trade (including repairs and installations of machinery), and \$56.2 million for hotels and restaurants.

### **3.4 Operating Surplus/Mixed Income<sup>1</sup>**

As domestic production in the Cayman Islands is largely in the domain of the private sector, it is expected that this category will be a prominent contributor to GDP.

As shown in Table 4, three industries account for a dominant share of approximately 85.0 percent of operating surplus/mixed income (before deducting interest expenses) in the country. Financing and Insurance Services, Real Estate, Renting and Business Activities, and Wholesale and Retail Trade industries each amassed operating surplus/mixed income in excess of \$100 million.

The largest amount of operating surplus/mixed income was recorded by the financing and insurance services at \$851.4 million in 2007 alone. It is noted that this amount is more than twice the amount of total compensation for the industry, which could be explained by significant amounts for interest expenses and/or net operating surplus.

The second largest amount of operating surplus/mixed income (before interest) was recorded for the real estate, renting and business activities, amounting to (\$245.4 million). This is followed by the wholesale and retail industry, with \$114.6 million.

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<sup>1</sup> As shown in Table 4, the total amount of this income type comprises two parts:

- (A) : The amount before deducting interest expenses across industries, equivalent to \$1,426.7 million in 2007; and
- (B) : The total amount after deducting overall interest expenses which is equivalent to the line "Financial Services Indirectly Measure" (FISIM). Ideally, FISIM should be apportioned across the various spending industries. However lack of data does not currently permit this exercise.

Table 4. OPERATING SURPLUS AND MIXED INCOME (CIS\$000)

Industry	2006	2007
Agriculture	2,533.1	2,669.6
Fishing	1,174.4	1,279.7
Mining & Quarrying	11,454.5	9,216.7
Manufacture	11,954.6	12,680.6
Electricity & Water Supply	29,588.6	34,839.1
Construction	41,110.7	39,999.4
Wholesale & Retail Trade, Repairs & Installation of Machinery	112,208.6	114,638.1
Hotels & Restaurants (incl Bars)	29,245.1	32,001.8
Transport, Storage & Communication	54,893.7	48,541.0
Financing & Insurance Services	775,051.6	851,385.6
Real Estate, Renting & Business Activities	222,347.6	245,418.3
Public Administration and Defense	-	-
Education Services	2,075.0	2,025.7
Health and Social Work	4,570.6	5,723.7
Other Services	31,943.4	26,253.8
Less Financial Services Indirectly Measured (FISIM)	477,969.1	532,485.3
<b>TOTAL</b>	<b>852,182.4</b>	<b>894,187.8</b>

### 3.5 Consumption of Fixed Capital

Consumption of fixed capital (or depreciation cost of capital) is not expected to be a major contributor to GDP in the Cayman Islands in view of its economic structure where service industries rather than manufacturing play the dominant part.

As presented in Table 5, the largest amounts of depreciation in 2006-2007 were incurred in the financing and insurance services closely followed by transport, storage and communication. The latter industry is physical capital-intensive which explains its significant amount of depreciation. The other industries with relatively large depreciation costs are wholesale and retail trade, electricity and water supply and real estate, renting and business activities.



Table 5 Consumption of Fixed Capital (CIS\$000)

Industry	2006	2007
Agriculture	166.2	197.6
Fishing	348.8	383.3
Mining & Quarrying	1,921.9	2,309.8
Manufacture	1,216.7	1,355.1
Electricity & Water Supply	15,972.0	17,587.0
Construction	5,405.6	6,170.9
Wholesale & Retail Trade, Repairs & Installation of Machinery	18,796.3	19,471.1
Hotels & Restaurants (incl Bars)	5,276.7	5,721.6
Transport, Storage & Communication	23,895.7	28,978.1
Financing & Insurance Services	26,190.1	31,030.6
Real Estate, Renting & Business Activities	11,840.3	12,181.6
Public Administration and Defense	6,884.1	7,400.3
Education Services (private)	3,509.5	3,292.0
Health and Social Work (private)	2,640.8	3,452.2
Other Services	6,232.8	9,993.5
<b>TOTAL</b>	<b>130,297.4</b>	<b>149,524.7</b>

### 3.6 Taxes less Subsidies on Production and Imports

Table 6 shows two data sets: 1) Other Taxes on Production net of Other Subsidies on Production charged to industries; and 2) Taxes net of Subsidies charged to buyers of products and imports. The second type of charges is more dominant as it accounts for 57.8 percent of all taxes (net of subsidies) in 2007.

The industrial breakdown of the first type of taxes "Other taxes on Production" showed that the financing and insurance industry alone accounted for 73.0 percent of all taxes (net of subsidies) paid by the domestic industries. This data shows the importance of the industry as a revenue base.

Table 6 Taxes less Subsidies on Production and Imports (C1\$000)

Industry	2006	2007
Agriculture	73.8	91.1
Fishing	65.1	251.5
Mining & Quarrying	144.9	194.5
Manufacture	196.6	246.7
Electricity & Water Supply	846.0	1,021.0
Construction	1,327.4	3,323.6
Wholesale & Retail Trade, Repairs & Installation of Machinery	5,162.6	5,157.0
Hotels & Restaurants (incl Bars)	987.5	1,021.0
Transport, Storage & Communication	8,144.1	8,875.2
Financing & Insurance Services	112,025.4	110,949.9
Real Estate, Renting & Business Activities	17,948.3	20,269.8
Public Administration and Defense	16.6	2.5
Education Services (private)	16.0	26.3
Health and Social Work (private)	191.6	187.8
Other Services	500.5	470.0
Taxes less Subsidies on Products	221,815.4	209,035.1
<b>TOTAL</b>	<b>369,461.6</b>	<b>361,122.9</b>