



*Economic
impact study*
Cayman Turtle
Farm

May 2013

pwc



Basis of Preparation and Disclaimer

Basis of Preparation

This report has been prepared solely for the purpose of providing the Cayman Turtle Farm (“CTF” or “You”) with our assessment of the overall contribution of CTF to the Cayman Islands economy, as required under our engagement letter dated 21 March, 2013 (the “Engagement Letter”), between PwC Corporate Finance & Recovery (Cayman) Limited (“PwC”) and the CTF. PwC Corporate Finance & Recovery (Cayman) Limited is a member firm of PricewaterhouseCoopers International Limited, each member firm of which is a separate legal entity.

Disclaimer

This report is strictly confidential and must not be provided to or made available, by any means, to any person other than the intended recipients, the CTF and the Cayman Islands Government (‘CIG’). This report should not be copied or disclosed to any third party or otherwise be quoted or referred to, in whole or in part, without the prior written consent of PwC. In the event that this report is obtained by a third party or used for any purpose other than in accordance with its intended purpose, any such party relying on the report does so entirely at their own risk and shall have no right of recourse against PwC, and its partners, directors, employees, professional advisors or agents. None of PwC, its partners, directors, employees, professional advisors or agents accept any liability or assume any duty of care to any third party (whether it is an assignee or successor of another third party or otherwise) in respect of this report and any such party who receives a copy of this report whether from PwC, or any other source shall have no right of recourse against PwC, its partners, directors, employees, professional advisors or agents.

In preparing this report PwC must stress that it has relied upon information provided by, amongst others, the CTF, the CIG, the Department of Tourism, the Economic Statistics Office, private sector tour operators and tourism attraction owners and BREA (Business Research & Economic Advisors). **PwC has not performed an audit examination on this information. Except where specifically stated, PwC has not sought to establish the reliability of the sources of information presented to them by reference to independent evidence. The financial analyses presented in this report are based on estimates and assumptions, and projections of uncertain future events. Accordingly, actual results will vary from the information provided in this report, even if some or all of the assumptions materialize such variances may be significant as a result of unknown variables.**



The Board of Directors
Cayman Turtle Farm
786 North West Point Road
West Bay, PO Box 62
Grand Cayman, Cayman Islands

16 May, 2013

Dear Sirs,

Economic Impact Study of the Cayman Turtle Farm

We are pleased to present our report assessing the overall contribution of the Cayman Turtle Farm (“CTF” or “You”) to the Cayman Islands economy, as required under our engagement letter dated 21 March, 2013, between PwC Corporate Finance & Recovery (Cayman) Limited (“PwC”) and the CTF.

In preparing this report, PwC has relied upon information provided by, amongst others, the CTF, the CIG, the Department of Tourism, the Economic Statistics Office, private sector tour operators and tourism attraction owners and BREA (Business Research & Economic Advisors). PwC has not performed an audit examination on this information. Except where specifically stated, PwC not sought to establish the reliability of the sources of information presented to them by reference to independent evidence. The financial analyses presented in this report are based on estimates and assumptions, and projections of uncertain future events. Accordingly, actual results will vary from the estimates provided in this report, and even if some or all of the assumptions materialize such variances may be significant as a result of unknown variables.

We would be pleased to meet with you at your convenience, to discuss the report and our findings.

We appreciate the opportunity to assist you with this matter.

Very truly yours,

Simon Conway
Duly Authorised Officer
simon.r.conway@ky.pwc.com
T: 345 914 8688
F: 345 945 4237

PwC Corporate Finance & Recovery (Cayman) Limited, P.O. Box 258, Strathvale House, Grand Cayman KY1-1104, Cayman Islands T: +1 (345) 949 7000, F: +1 (345) 945 4237, www.pwc.com/ky

Unless otherwise stated, "PricewaterhouseCoopers" or "PwC" refers to PwC Corporate Finance & Recovery (Cayman) Limited, which is a member firm of PricewaterhouseCoopers International Limited, each member firm of which is a separate legal entity.

Contents

Basis of Preparation and Disclaimer	2
Basis of Preparation	2
Disclaimer	2
1. PwC's assignment	6
1.1. Introduction	6
1.2. Overview of PwC's economic impact methodology	6
1.3. Report structure	6
2. Overview of the CTF	7
2.1. Introduction	7
2.2. Pattern of visitors	7
2.3. Financial performance	10
2.4. Role of CTF in Cayman Islands tourism sector	11
3. Assessment of economic contribution of Cayman Turtle Farm	14
3.1. Introduction	14
3.2. Economic impact assessment framework	14
3.3. Estimating the economic contribution of the CTF	15
3.3.1. The direct economic impacts of the CTF	16
3.3.2. Establishing the most appropriate multipliers	17
3.3.3. Measuring the indirect and induced economic impacts	18
3.3.4. Estimating the employment supported by the CTF	18
3.3.5. Measuring the wider economic impacts of the CTF	18
3.4. Summary	22
4. Potential future contribution of the CTF – alternative scenarios	23
4.1. Introduction	23
4.2. Approach	23
4.3. Without a subsidy for CTF – Scenario 1	24
4.3.1. Impact on CTF operations	24
4.3.2. Impact on tourism spend	24
4.4. With a continued subsidy of CTF – Scenarios 2a and 2b	27
4.4.1. Scenario 2a – No development of Cruise Port	27
4.4.2. Scenario 2b – Development of Cruise Port	27
4.5. Estimating the potential future economic impacts of the CTF	29
4.5.1. Scenario 2a – CTF with subsidy (no Cruise Port redevelopment)	29
4.5.2. Scenario 2b – CTF with subsidy (Cruise Port redevelopment)	30

4.6. Sensitivity analysis	30
5. Conclusions and recommendations	33
5.1. Introduction	33
5.2. Economic impact of Cayman Turtle Farm	33
5.3. Recommendations	34
Appendix A. - Engagement Letter	36
Appendix B. - List of documents consulted	37

1. PwC's assignment

1.1. Introduction

The CTF is a statutory company governed by a board of directors, which is owned and under the ultimate authority of the CIG, and specifically the Ministry of Tourism and Development (“Ministry of T&D”).

While an autonomous body, CTF remains financially dependent on the Government of the Cayman Islands (“CIG” or “Government”), requiring a substantial subsidy each year to fund operating losses and debt service costs. CTF's operations also have close linkages with a number of areas of the Cayman Islands' tourism economy, most notably the cruise industry and associated tours on-island.

Accordingly, in order for the board of CTF, its advisory committee and the CIG to consider the subsidy requirements in the wider context, the board has engaged PwC to undertake an economic study to understand the overall contribution of CTF to the Cayman Islands economy.

To assist it in completing the economic study, PwC engaged as subcontractors, industry experts from PricewaterhouseCoopers LLP in the United Kingdom. PwC is solely responsible for the Independent Review. PwC Corporate Finance & Recovery (Cayman) Limited is a member firm of PricewaterhouseCoopers International Limited, each member firm of which is a separate legal entity.

1.2. Overview of PwC's economic impact methodology

The purpose of this study, as set out in the Engagement Letter, is to assess the overall contribution of the CTF to the Cayman Islands economy. The economic study will identify and support key assumptions and take into account linkages with the wider Cayman economy, impacts compared to alternative counter-factual scenarios without the CTF and probable future developments impacting the Turtle Farm.

PwC will consider economic impacts over a period approximating to the CTF's useful economic life. For the purposes of this study the CTF useful economic life has been estimated at 15 years, after which point a substantial renovation is likely to be required. Economic impacts will be considered both in terms of financial value and contribution to employment.

This approach used is consistent with that used in the UK by HM Treasury¹. PwC's detailed methodology and assumptions are set out in Sections 3 and 4 of this report.

The economic impacts are the net impacts which are estimated to accrue to the Cayman economy and to its citizens. The principal impacts are those on the tourism sector (which provides the prospect of faster economic growth and improved employment prospects).

Unless otherwise stated, all amounts in this report are presented in United States dollars in present value terms.

1.3. Report structure

This report is set out in five sections. Following the current Section 1, Section 2 describes the operations of the CTF and explains the role it plays in the context of the Cayman Islands tourism sector. Section 3 assesses the current economic impact of the CTF in 2012. Section 4 assesses the potential future economic of the CTF depending upon whether it continues to receive a subsidy from the CIG. Finally, a summary of PwC's conclusions and recommendations are presented in Section 5.

¹ HM Treasury, 2006, Value for Money Assessment Guidance, page 7

2. Overview of the CTF

2.1. Introduction

CTF was established in 1968, principally as a sea turtle commercial farming and conservation facility. Since that time, as the Cayman Islands' tourism sector grew, CTF evolved into a major tourism attraction while still retaining the conservation and farming role.

CTF is located in West Bay, on Grand Cayman, and currently employs 90 staff, of which c.90% are Caymanian.

By March 2007 CTF completed a major redevelopment and moved to new facilities incorporating water-based features and 50,000 square feet of new buildings over a circa 23 acre site. This redevelopment was prompted in part by calls from the major customer group, the cruise industry, to widen the CTF offering as well as a need to relocate the facilities slightly inland following hurricane damage in recent years.

In 2012, CTF received 229,393 visitors, of which a high proportion (71%), were cruise passengers. CTF is therefore heavily reliant on cruise passenger volumes.

In 2012, the World Society for the Protection of Animals ("WSPA") raised a number of concerns regarding CTF; specifically on areas such as water quality, overcrowding and unsupervised human handling. In response CTF commissioned an independent review in 2012, which concluded that the facility has an overall positive conservation impact. CTF also met with the Florida-Caribbean Cruise Association ("FCCA") to discuss WSPA's allegations and potential mitigating actions to address concerns. Based on the FCCA's response, it would appear that CTF continues to enjoy the cruise industry's support despite WSPA's continued allegations.

2.2. Pattern of visitors

The CTF offers a 'Full Access' tour and a 'Turtle Only' tour; the former includes additional interactive activities, such as swimming in the sea life lagoon.

Tickets are sold through various channels, with prices differentiated for each channel, namely:

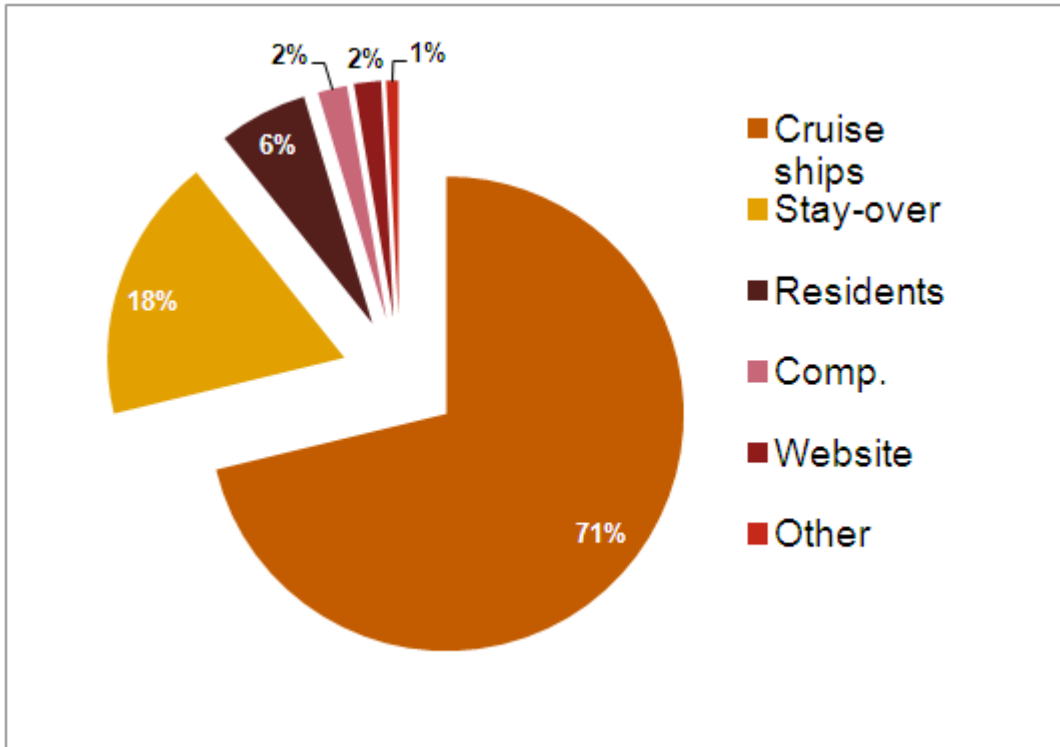
1. Wholesale to the cruise ships;
2. Wholesale to the cruise ships via independent tour operators ("ITOs");
3. 'Walk up' sales at the gate; and
4. Resident rates and complimentary tickets.

Based on feedback from the ITOs and CTF itself, the visitor demographics are relatively broad although, in general, the core market is price conscious, young-family groups.

Figure 1 below provides an overview of the sources of CTF admissions in 2012 and emphasizes the reliance on the cruise industry, which provides some 71% of the CTF visitors. In particular, family and price conscious oriented cruise lines, such as Disney and Carnival respectively, are major sources of visitors.

Figure 1

Sources of CTF Visitors 2012

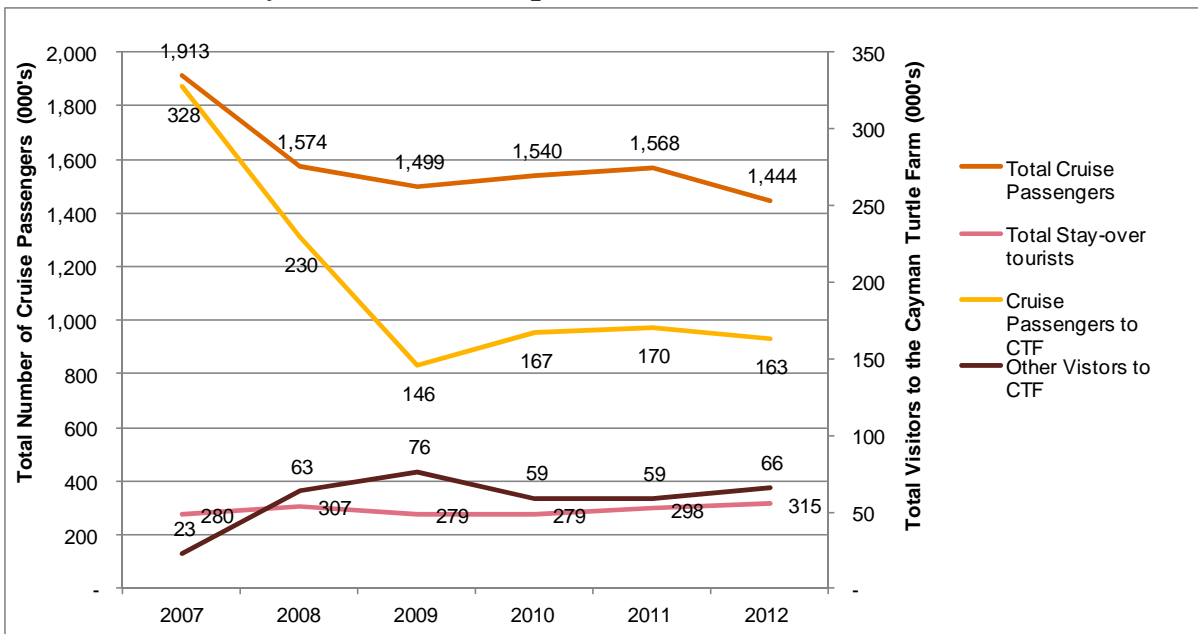


Source: CTF

As illustrated in Figure 2 below, CTF cruise passenger visitor numbers have underperformed the wider Cayman Islands cruise industry. Whereas other visitors, principally stay-over tourists, have outperformed the overall Cayman stay-over tourism trend.

Figure 2

Total cruise and stay-over tourists compared to visitors to CTF



Source: CTF and Cayman Islands Department of Tourism

Over the past five years, annual CTF cruise-related visitor numbers have fallen 50% from 327,777 in 2007 to 163,373 in 2012. This decline can only be partially attributed to the wider 12% decline in overall cruise visitors to the Cayman Islands over the same period. CTF has attracted a falling share of the Cayman Islands cruise tourism market, as illustrated in Figure 3, with a 17% CTF share in 2007 falling to 11% by 2012.

Figure 3

CTF visitors – key performance indicators

(US\$s)	2007	2008	2009	2010	2011	2012
Net Admission Revenues*	\$3,629,324	\$3,711,065	\$3,046,391	\$3,177,289	\$3,390,920	\$3,464,744
Visitor Numbers						
- Cruise	327,777	229,649	145,753	167,213	170,238	163,373
- Stay-over	16,894	32,352	42,807	37,388	37,942	41,418
- Other	6,327	31,007	33,474	21,687	20,966	24,602
- Total	350,998	293,008	222,034	226,288	229,146	229,393
Average Ticket Pricing	\$ 10.34	\$ 12.67	\$ 13.72	\$ 14.04	\$ 14.80	\$ 15.10
Total Cayman Cruise Visitors	1,913,071	1,574,076	1,498,531	1,539,760	1,568,093	1,444,090
Total Cayman Stay-over Visitors	279,858	306,738	279,198	279,388	298,248	315,153
Share of Cruise Market	17%	15%	10%	11%	11%	11%
Share of Stay-over Market	6%	11%	15%	13%	13%	13%

* Note: Net Admission Revenues stated net of ITO recharges

Source: CTF and Cayman Islands Department of Tourism

This declining share of the cruise market can be largely explained by a substantial increase in wholesale ticket prices following CTF's relocation to its new site in 2007. Given the highly price sensitive nature of the majority of cruise-related visitors, these price increases led to a 56% loss in cruise-related visitors over the following two years.

Since 2007/2008, CTF has sought to partially mitigate this impact through:

1. Some reduction in wholesale prices to support cruise-related visitor volumes, although wholesale prices remain well above pre-2007 levels;
2. Increased focus on CTF tours sold directly through the cruise lines, often in combination packages; and
3. Marketing effort to drive growth in higher margin stay-over tours sales, with CTF's stay-over market share more than doubling to 13% by 2012.

While the overall sales mix has generated higher net revenue per ticket, the impact of falling visitor numbers has more than outweighed this effect. PwC understands from CTF's management that, even during the busiest tourism season, the CTF facility uses only a fraction of its overall capacity, although there are some customer 'bottlenecks' during very busy periods, such as the restaurant.

However, despite the recent visitor declines, exit survey data from the Cayman Islands Government's Department of Tourism ('DoT') indicate that CTF remains the Cayman Islands most popular land-based tour attraction and the recent trend data suggest that CTF cruise-related admissions have now steadied at c.11% of the cruise market.

2.3. Financial performance

Figure 4 provides a summary of the financial performance of CTF over recent years.

Figure 4

CTF financial performance (years ended June 2008 – June 2012)

(US\$000's)	2008	2009	2010	2011	2012
Revenue					
- Net Admission Revenue *	3,711.1	3,046.4	3,177.3	3,390.9	3,464.7
- F&B and Retail Revenue	1,769.8	1,804.0	1,483.9	1,600.0	1,745.5
- Other	1,269.3	1,146.0	795.5	686.1	831.2
Total	6,750.2	5,996.4	5,456.7	5,677.0	6,041.4
Cost of Sales	1,211.6	1,146.7	862.1	938.5	711.9
Gross Profit	5,538.6	4,849.7	4,594.6	4,738.5	5,329.5
Gross Margin %	82.1%	80.9%	84.2%	83.5%	88.2%
Operating Expenses	12,977.0	11,981.7	9,042.0	8,640.5	9,557.5
Year-on-Year % Change		-7.7%	-24.5%	-4.4%	10.6%
EBITDA	(7,438.3)	(7,132.0)	(4,447.5)	(3,902.0)	(4,228.0)
Depreciation	2,810.5	3,400.0	3,400.0	3,127.5	3,252.3
Financing costs	3,027.7	2,716.1	2,581.3	2,451.1	2,203.7
Net Profit (Loss)	(13,276.5)	(13,248.1)	(10,428.8)	(9,480.6)	(9,683.9)

* Note: Net Admission Revenues stated net of ITO recharges

Source: CTF

As noted in 2.2 above, admissions revenues have been heavily impacted by declining visitor numbers.

The large decline in admissions initially caused a corresponding decline in food & beverage and retail from 2008 – 2010. Since 2010 F&B and retail sales have recovered, reflecting efforts to better target the retail and F&B offering.

Other revenues principally relate to sales of turtle meat for consumption and rental revenues for the Dolphin Discovery site and concessions within CTF.

The overall improvement in gross margins since 2008/09 is principally a result of:

1. A shift in the sales mix toward higher-margin direct sales of combination tickets to the cruise lines (rather than via ITOs) and a rising proportion of higher priced stay-over ticket sales; and
2. Improved focus on F&B and retail sales.

The bulk of the overhead base comprises payroll, energy costs, feed supplies and insurance. As part of the redevelopment of CTF, the facility significantly increased employment across the operational and administration functions during 2005 – 2008, with overall payroll costs increasing by up to 400% over that period. However, following the significant fall off in visitor numbers in 2007/08, new management subsequently brought in a range of restructuring measures and in particular workforce reductions, resulting in a 39% reduction in overall payroll costs during the period 2008 – 2012.

Nevertheless, the current size of the workforce remains significantly higher than the pre-redevelopment levels and represents the major cost driver for CTF. Similarly, energy costs also increased significantly following redevelopment as a result of the need to pump water to the new site.

Efforts to address losses since 2009/10 have resulted in savings in a number of controllable cost areas. However, non-controllable categories, such as unit energy prices, have contributed to the c.10.6% increase in the overhead base in 2012.

Overall, while the recent restructuring efforts have had some positive impact, the CTF remains heavily loss making at the operating level, thus making a negative overall direct economic contribution.

If the current scale of CTF operations and the existing sales pricing and mix remained unchanged, PwC estimates that to achieve break-even operating performance a significant volume of additional visitors per year would be required. Even assuming a significant future increase in cruise visitors to the Cayman Islands and a large increase in CTF's cruise market share, it is unlikely that this break-even level of CTF visitors could be achieved without structural change to the operations.

A major reduction in CTF's scale of operations coupled with changes in the sales and pricing mix could possibly deliver the improved operating performance required. However, for the purposes of this economic review, it is assumed that the operating scale and overall sales mix will remain constant over the review period.

The current debt balance of \$37.5m represents the outstanding portion of debt originally incurred to fund the redevelopment and gives rise to substantial financing costs.

CIG, as shareholder of CTF and guarantor of the bulk of CTF's debt, funds these annual losses and debt service costs through subsidies. In light of its guarantor status over the bulk of the debt, CIG's obligations with respect to the CTF debt will remain irrespective of whether the CTF continues to operate or not.

Accordingly, the relevant subsidy cost to CIG for decision making purposes is funding of the annual operating losses before depreciation incurred by the CTF; that is, the Earnings before Interest Taxation Depreciation and Amortization ("EBITDA") which in recent years averages around EBITDA losses of c.\$4m per annum.

2.4. Role of CTF in Cayman Islands tourism sector

CTF is very heavily reliant on cruise passenger volumes and is exposed to any variation in those volumes and the cruise line wholesale prices. However, CTF has a market share of c.11% of cruise visitors and c.13% of stay-over tourists. While the CTF's cruise penetration has reduced significantly, it still accounts for roughly 20% of the excursions taken by cruise passengers in the Cayman Islands, based on BREA's estimate of 55.9%² total shore excursions.

To an extent there is a symbiotic relationship between CTF and the cruise lines, as CTF represents the second most popular attraction in the Cayman Islands (and most popular land-based attraction) and is therefore a significant draw in the cruise lines' marketing of their itinerary, as well as a significant source of the cruise lines' all-important margin from tour sales in the Cayman Islands.

Figure 5 below sets out some of the key statistics of Cayman Islands' cruise related tourism, relative to other destinations in the region.

² ECONOMIC CONTRIBUTION OF CRUISE TOURISM TO THE DESTINATION ECONOMIES, Business Research and Economic Advisors, September 2012, Page 34.

Figure 5

Cruise Tourism Statistics 2012

Country	Time in Port (Hours)	Disembark (%)	Spend per Passenger (US\$)	Passengers Purchasing Shore Excursions (%)
Antigua	4.3	88%	\$65.30	51.6%
Aruba	4.0	90%	\$95.40	50.2%
Bahamas	4.3	90%	\$64.80	36.3%
Barbados	4.2	75%	\$65.60	54.0%
Belize	4.7	83%	\$73.00	70.3%
British Virgin Islands	4.1	89%	\$65.50	60.8%
Cayman Islands	4.3	90%	\$93.70	55.9%
Colombia	3.6	89%	\$98.80	75.8%
Costa Rica	5.6	87%	\$71.50	82.4%
Curacao	4.1	92%	\$71.70	49.9%
Dominica	3.8	88%	\$47.80	63.6%
Dominican Republic	3.8	85%	\$69.50	63.5%
Grenada	3.7	88%	\$40.80	50.7%
Honduras	4.5	85%	\$62.20	63.9%
Nicaragua	4.3	90%	\$45.60	64.8%
Puerto Rico	4.3	91%	\$118.10	48.9%
St Kitts and Nevis	4.4	89%	\$108.90	59.4%
St Maarten	4.5	90%	\$185.40	46.6%
St Vincent and the Grenadines	3.5	90%	\$27.10	35.6%
Turks & Caicos	3.8	90%	\$63.90	44.2%
U.S. Virgin Islands	4.5	90%	\$146.70	45.5%
Weighted Average	4.2	88%	\$95.92	56.2%

Source: Business Research and Economic Advisors, September 2012

PwC understands that the relatively high rate of passenger disembarkation in Cayman, at 90%, can largely be attributed to the low crime rates, good amenities in the vicinity of the disembarkation point and good overall range of activities offered.

At 55.9%, the Cayman Islands take-up of shore excursions is broadly in line with the rest of the region as a whole. However, when compared to similar small islands in the region, with limited inland sights and natural attractions, the Cayman Islands rate of tour take-up appears high. This relatively high rate of tour take-up may be partially attributable to the popularity of both CTF and Stingray City.

CTF's core advantages as a tourism attraction could be summarized as:

- **Unique offering:** Along with Stingray City, the CTF represents a unique experience for tourists. This is particularly critical for the cruise industry, where passengers are offered very similar experiences at the various itinerary destinations, such as dolphinariums, water parks and shopping excursions.
- **High capacity and family value:** Unlike many Cayman Islands alternative attractions, CTF has significant capacity. CTF also effectively targets the price-conscious family market.

The main alternatives to CTF would include high-volume, family oriented attractions such as Stingray City, the beach and budget water-based activities such as snorkeling. To a lesser extent, shopping and dining and higher-priced attractions such as swimming with dolphins also represent CTF substitutes.

Section 4 of this report examines the merits of the alternative attractions and the likely responses of cruise lines and cruise passengers to a closure of the CTF.

Increasingly, CTF visitors purchase their tickets as part of a wider 'combination tour', which includes alternative attractions in West Bay and nearby water-based attractions, including:

- Dolphin Discovery;
- Hell Post Office;
- Tortuga Rum Cake Factory;
- Automobile Museum; and
- Stingray City.

Section 3 of this report examines the extent to which the CTF acts as an anchor for these combination tours, bringing increased admissions and spend at the linked attractions.

3. Assessment of economic contribution of Cayman Turtle Farm

3.1. Introduction

This Section of the report provides an assessment of the economic contribution of the CTF to the Cayman Islands economy.

PwC has used economic impact analysis to estimate the scale of the contribution to the Cayman Islands' economy using two indicators to quantify economic activity: **economic output**, as measured by the Gross Value Added ("GVA"), and **employment** supported.

The Section is structured as follows:

- A description of the economic impact assessment framework;
- A summary of the analysis of the gross impacts that arise from the CTF;
- An assessment of the sensitivity of the results to key assumptions; and
- A summary of the key conclusions.

3.2. Economic impact assessment framework

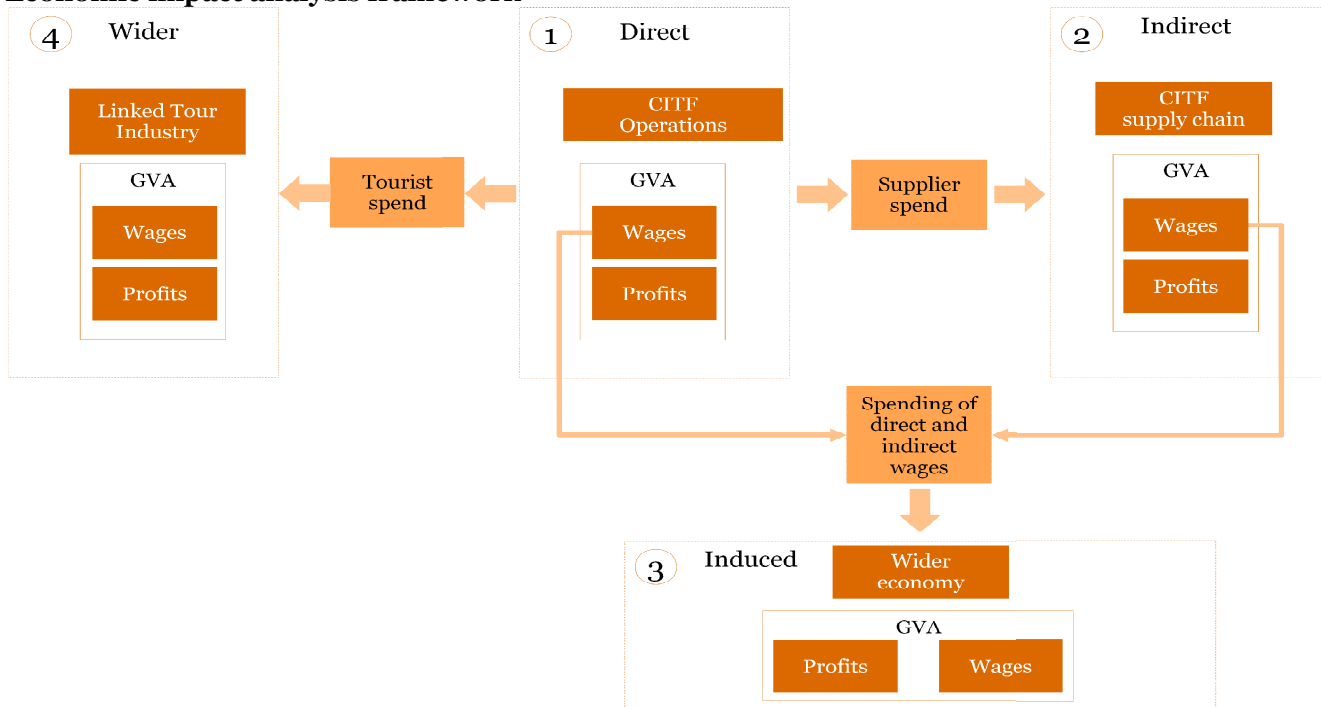
Economic impact analysis is an established methodology for assessing and valuing the economic impacts of investments. The technique is widely used by national governments, non-governmental organizations, multinational companies and other stakeholders across a range of emerging and developed countries.³ This part of the Section introduces this methodology as it has been applied to evaluate the CTF's impact on the Cayman Islands economy.

PwC's approach has considered the impact of the CTF focusing on two indicators of economic activity. The economic output as measured by GVA is estimated alongside the total number of jobs supported by the CTF. This provides an estimate of the 'gross' impact associated with the CTF. Importantly, this analysis assesses the impact on the Cayman Islands only and does not include the impact on other countries.

³ See for example, HM Treasury (2011) 'The Green book – Appraisal and Evaluation in Central Government'

Figure 6

Economic impact analysis framework



The impact on GVA and jobs is divided into four types: direct, indirect, induced and wider impacts. Such a division reflects the interdependencies between industries in an economy, and allows for the capture of the full effect associated with the CTF. Figure 6 provides an overview of these impacts:

- **Direct impact** corresponds to the contribution made to the Cayman economy as a direct result of the CTF. This refers principally to the wages and profits (or jobs) that arise from the operation of the CTF.
- **Indirect impact** is created primarily by the purchase of goods and services from firms that supply the CTF. This supports profits and wages that accrue across the supply chain.
- **Induced impact** is the additional impact on the economy resulting from increased expenditure by the workforce employed directly by the CTF and indirectly by its supply chain, as income earned by these employees is spent on various goods and services, leading to further economic activity and employment in the Cayman Islands.
- **Wider impact** captures the additional economic activity resulting from the spending by visitors to the CTF elsewhere in the Cayman economy. These wider impacts include transport and complimentary attractions linked to the CTF and other cruise passenger spending in the Cayman Islands.

3.3. Estimating the economic contribution of the CTF

This part of the Section presents PwC’s analysis and assessment of the economic contribution of the CTF. It describes each of the stages set out in Figure 7 for this analysis in detail.

Figure 7

Overview of the stages in the economic impact assessment

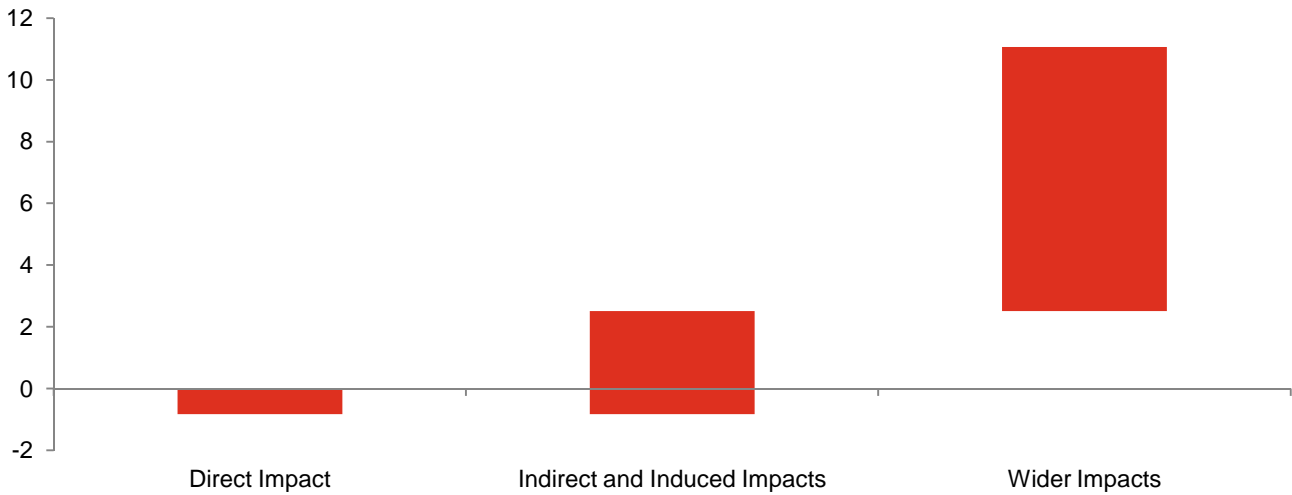


PwC’s analysis indicates that the current direct economic impact of the CTF is negative (-\$0.8m in 2012). This is because the revenues earned are less than the cost of bought in goods and services. The indirect and induced economic impacts for the CTF in 2012 are estimated at \$3.3m. The wider economic contribution has been estimated on the basis of overall related tourism and visitor spending, applied to CTF’s market share. On this basis, the wider economic contribution of the CTF is estimated at \$8.6m per annum.

Overall, the estimated economic contribution to Cayman Islands’ GVA is \$11.1m. This in turn is estimated to support employment of 290FTEs.

Figure 8

Current economic contribution of CTF (GVA, \$m)



Source: PwC analysis

3.3.1. The direct economic impacts of the CTF



PwC has estimated the direct economic impact of the CTF, measured in terms of GVA, by estimating the value of its component parts ((a) operating profits⁴, (b) payroll and (c) amortization/depreciation).

(a) Estimating operating profits

Operating profits, defined as revenues minus costs, were estimated based on data on revenue and costs provided by the CTF.

(b) Estimating payroll

The payroll estimate is based on data provided by the CTF on payroll costs as a proportion of total operating costs.

(c) Amortization/depreciation

Data on amortization and depreciation have been provided by the CTF.

(d) Estimating GVA

The direct GVA has been calculated as the sum of (a) operating profits, (b) payroll and (c) amortization/depreciation.

According to payroll data provided by management, CTF’s staff is c.90% Caymanian, with the remainder expatriate. Migrant employees tend to repatriate some of their income to their home country. This creates a “leakage” from the Cayman Islands’ economy and means that some of the economic impacts associated with the CTF are likely to flow outside the country. Given the relatively small scale of employment and high proportion of Caymanians at CTF, this potential leakage has not been factored into the economic model.

⁴ Operating profit refers to the accounting concept of earnings before interest and tax (EBIT).

3.3.2. Establishing the most appropriate multipliers



‘Multipliers’ are commonly used to estimate the indirect and induced economic impacts that result from the operation of a business like the CTF. Multipliers are a way of estimating how economic impacts cascade through an economy. The GVA multipliers measure the ratios of the indirect and induced GVA impacts on the economy relative to the initial direct GVA impact (as measured above). They can also be expressed in terms of employment multipliers, determined by the ratios of jobs created in the wider economy relative to the direct employment impact of the firm or industry. In the case of the CTF, where the direct GVA is estimated to be negative, a slightly different approach is required which involves estimating the GVA associated with the CTF’s purchases of goods and services.

Multipliers vary across the sectors of the economy and across countries as they reflect the unique structure and inter-dependencies in the economy being analyzed. Multipliers are usually estimated using Input-Output (IO) tables or Social Accounting Matrices (SAMs). PwC has not been able to calculate multipliers in this way for the Cayman Islands as the data required are not available. Instead, following an extensive review of the available international literature, PwC has taken the multipliers from a study by Tian et al. of the economic impact of tourism in Hawaii. This has the benefit of being a relatively recent study. Moreover, Hawaii has some similar economic features to the Cayman Islands (e.g. in terms of being an island economy with comparable per capita income levels and a significant tourism sector). Multipliers for Jamaica or the Dominican Republic would be less relevant as their economies are larger and more diverse than the Cayman Islands, whereas more comparable Caribbean economies, such as Bermuda, do not produce these estimates. The match is necessarily imperfect and so the precise multipliers should be treated with some caution.

Figure 9 summarizes the multipliers used in this analysis.

Figure 9

Multipliers used to estimate the indirect and induced impacts

Type of multiplier	Multiplier	Impact
GVA multiplier	1.4	Additional benefits to the economy that accrue in the form of GVA to employers and employees from operation of the CTF
Intermediate consumption multiplier (local)	1.4	Additional benefits to the economy from spending on locally produced intermediate inputs
Intermediate consumption multiplier (imports)	-0.197	Lost benefits to the economy from spending on foreign produced intermediate inputs

Source: Tian et al. (2011) *The Direct and Indirect Contributions of Tourism to Regional GDP: Hawaii, the Economic Research Organization at the University of Hawaii.*

The income generated from the operation of the CTF which accrues to its owners in the form of operating profits or to employees as payroll distributions has a positive impact on the economy. Income that is accrued by the operating firm(s) may be used to invest in further developments or can be distributed to its investors. Employees use their wages to consume other goods and services or to invest.

The expenditure that the CTF makes on local materials that are required for its operations also has a positive impact on the economy. This expenditure is calculated by estimating the share of operating costs that relate to local materials, which was informed by the CTF. Economic benefits are realized as income that is received by upstream firms in the supply chain which is then spent on other goods and services, invested or distributed to employees.

In contrast, the Cayman Islands economy will lose income when money is spent abroad on imported materials as income is redirected from the Cayman economy to trade partners. Based on information provided by the CTF, the expenditure that leaks out of the Cayman Islands has been estimated based on the share of each element of operating costs that relate to imported materials.

3.3.3. Measuring the indirect and induced economic impacts



The next stage of PwC’s approach combines the direct GVA and employment impacts estimated in stage 1 with the multipliers identified in stage 2. This provides estimates for the indirect and induced impacts.

The indirect impact on the Cayman Islands economy is that which results from the purchase of goods and services by firms directly involved in the CTF’s supply chain. The induced impact is the additional impact on the economy resulting from increased expenditure in the Cayman Islands by the workforce employed directly by the CTF and indirectly by people employed in its supply chain.

3.3.4. Estimating the employment supported by the CTF

The economic contribution of the CTF can also be expressed in terms of the employment that it supports, directly, indirectly and more widely.

The employment is estimated in terms of Full-Time Equivalents (“FTEs”).

This estimate is based on data provided by the CTF.

The CTF directly supports 90 jobs.

A standard method for estimating the employment supported by the indirect and induced impacts of the CTF is to use employment multipliers. This method works in a similar way to the multipliers applied to estimated GVA, described above. However, the data are not available for the Cayman Islands to calculate the relevant multipliers, so PwC has instead taken an estimate of GVA per employee from the Cayman Islands’ national accounts and applied different sector weights to get the most appropriate estimate of GVA per employee, see Figure 10. These estimates are combined with the relevant output from the GVA impact estimate to provide an estimate of the number of employees required to support the given level of GVA.

Figure 10

GVA per employee (2009)

	GVA per employees	Description
Used for construction impact	\$85,737	Average GVA per employee less FISIM
Used for GVA impact	\$79,045	Average GVA per employee weighted by CPI consumption basket
Used for intermediate consumption (local) impact	\$74,098	Average GVA per employee weighted by Hawaii input-output tables expenditures
Used for intermediate consumption (imported) impact	\$74,619	Average GVA per employee weighted by Hawaii input-output tables expenditures
Used for tourism expenditure impact	\$55,007	Average GVA per employee weighted by tourism expenditures from Jamaica 2012 Oxford Economics report

Source: Economic and Statistics Office, Cayman Islands

Note: Financial services indirectly measured (FISIM) has been removed from the estimate of economy wide GVA to account for the distorting effect of financial flows through the Cayman Islands’ economy.

3.3.5. Measuring the wider economic impacts of the CTF



The CTF also leads to important wider economic impacts beyond those captured above. The most significant are those which result from the additional spending by visitors to the CTF.

3.3.5.1. Impact of additional spending by visitors to the CTF

As well as making expenditures inside the CTF, visitors to the CTF are also likely to spend on goods and services outside the CTF, some of which, such as transport to CTF, are clearly related to the CTF facility. This generates economic benefits as income received by suppliers which then generates additional GVA as it is spent on other goods and services, invested or distributed to employees (which is eventually spent or invested). For the purposes of economic modeling, PwC considers the impact of all spending associated with cruise visitors to CTF, whereas for stay-over tourists their other spending on island is not considered to be linked to CTF.

In considering the wider economic impacts of the CTF, it is important to understand the extent to which the CTF underpins the Cayman Islands' overall tourism offering. Assessing the true value of CTF as a tourism draw is a subjective process and therefore requires careful consideration and triangulation of different data sources. However, this study seeks to examine the evidence on linkages by considering a range of different data sources, including:

1. DoT tourism statistics;
2. Interviews with CTF, the DoT and the Ministry of T&D;
3. Interviews with ITOs;
4. Interviews with competitor and complimentary attractions; and
5. BREAs' 2012 regional analysis of the economic impact of cruise tourism carried out on behalf of the FCCA.

In light of commercial sensitivities, cruise lines and the FCCA have not been directly contacted as part of this review. Instead, PwC has interviewed a number of industry participants with a long history of working with the cruise industry, to gauge the importance of CTF to the cruise lines.

PwC has examined the wider economic impacts separately for each of the major direct and indirect customer groups, in order to properly reflect the significant differences spending patterns and behaviors between the three main direct customer categories, cruise passengers, stay-over tourists and residents.

3.3.5.1.1. Cruise lines

At 71% of total CTF admissions, the cruise industry's customers also represent the largest customer group. While cruise lines are not the direct customers, the bulk of cruise related admissions are through tickets sold through the cruise lines either directly or via ITOs. As such, the cruise lines themselves are a significant customer group and CTF's marketing is heavily reliant upon the cruise lines.

As noted earlier, cruise passenger visits to CTF represent approximately 20% of the total tours taken by cruise passengers in the Cayman Islands. Increasingly since the global recession, the cruise industry has become reliant upon margin made on the sale of shore excursions to support overall profitability and keep headline cruise ticket prices down.

CTF ticket pricing data suggest that, in general, the cruise lines apply a mark-up on wholesale CTF ticket prices of c.100%. Based on discussions with CTF management, the market power of the cruise lines means they are able to exert significant influence on wholesale prices to protect retail margin.

Based on 2012 cruise-related admissions and revenue data, this would suggest that the cruise-lines are making a margin of up to c.\$1.7m per annum from the on-sale of CTF tickets.

In simplistic terms, this simply enhances profitability to the cruise lines and as such would have no wider economic impacts for the Cayman Islands.

However, interviews with the various Cayman Islands industry participants noted above indicate that, in the absence of this margin on CTF tour excursions, the cruise lines would likely seek to recover these returns elsewhere, possibly through either squeezing wholesale prices or raising retail prices on alternative attractions and transport. This effect is not explicitly captured in Section 3, but is examined further in Section 4.

3.3.5.1.2. Cruise passengers

There are three main areas in which CTF could influence cruise passengers' spending behavior and deliver wider economic benefits for the Cayman Islands.

Impact of choice of cruise itinerary:

Firstly, in light of its prominent role in marketing materials and unique offering, CTF may have some impact on cruise passengers' decisions to go on cruises which include a Cayman stop in the itinerary. While the importance of CTF for the Cayman Islands' overall tourism marketing should not be discounted, PwC considers that the actual impact of CTF on cruise passengers' itinerary decisions is likely to be de minimis.

Impact on decision to disembark:

Secondly, the availability of CTF tour tickets on-board the cruise ship could encourage passengers to disembark at the Cayman Islands, for the purpose of attending the tour, thus leading to additional spend in the Cayman Islands.

Currently c.11% of cruise visitors to the Cayman Islands go to the CTF. Whilst the majority of these CTF visitors would probably have disembarked in the Cayman Islands irrespective of the availability of the CTF tour to take part in alternative activities, for some visitors, in particular price-conscious family groups, the CTF may have been a decisive factor in their decision to disembark. Without CTF, such groups may choose to remain on board particularly given the breadth of child related activities on-board the cruise lines.

In Section 2 it was noted that the Cayman Islands has a relatively high cruise disembarkation rate of 90%, which can largely be attributed to the low crime rates, good amenities in the vicinity of the disembarkation point and good overall range of activities offered. The disembarkation rate of 90% in the Cayman Islands is 2% ahead of the regional average. For the purposes of determining the potential future impact of CTF on the decision to disembark from the cruise ships, we have assumed that this 'over-performance' against the regional average is a measure of the influence of the CTF. The sensitivity analysis later in this report tests the significance of this assumption on the estimated economic contribution of the CTF.

Impact on complimentary transport and attractions:

Finally, admissions to the CTF generate revenues for complimentary transport services and complimentary attractions on combination tours.

For the purposes of estimating the wider economic contribution from transport services, PwC has interviewed ITOs representing c.50% of the tourism transport industry in the Cayman Islands. The bulk of ITO tour sales are made through deals offered via the cruise lines, and the remainder are sold direct to disembarked passengers.

As with wholesale ticket pricing for CTF, wholesale pricing by the ITO sector also appears to be strongly influenced by the cruise lines. In particular, the large pool of operators and limited pricing co-operation between ITOs means that the ITO have been unable to pass on increasing input costs (such as petrol prices) through higher wholesale prices. As a result, profit margins reported by the ITOs are in the region of 10%.

In order to gauge the extent to which CTF generates revenues for nearby tourism attractions included on the same combination tour tickets, PwC interviewed owners and managers of a number of attractions which are included in CTF combination tickets. In general, these attractions fall into two main categories:

1. Admission charging attractions, which do not appear to derive significant revenues from CTF related visitors, and which could effectively act as substitutes for CTF, such as Stingray City, Dolphin Discovery and Dolphin Cove; and
2. No-admittance attractions, which offer complimentary services and benefit significantly from the volume of visitors to the CTF, such as Tortuga Rum Cake Factory and Hell Post Office.

While some attractions in the first category, such as Dolphin Discovery, receive substantial volumes of visitor numbers as a result of CTF, generally speaking, these derived visitors will act as spectators only and therefore not pay for the dolphin swimming experience. While there is likely to be some associated benefit from these visitors in the form of retail sales this is estimated to be minimal.

The second category, which represents complimentary attractions, can be considered to derive considerable wider benefits from the CTF. Owners and management of these facilities estimate that approximately one third of their visitor numbers and, an even high proportion of profitability is derived from CTF related visitors.

3.3.5.1.3. Stay-over tourists

While CTF contributes to the Cayman Islands' overall tourism product, PwC does not consider it likely that CTF has a material effect on the decision of stay over tourists to travel to the Cayman Islands (rather than other possible destinations).

However, as with cruise passengers, it is likely that the take-up of combination tours including the CTF by stay-over tourists generates additional spend in terms of transport and visits to complimentary attractions.

3.3.5.1.4. Residents

Residents and school parties are offered reduced admittance at CTF. In general, residents will not take-up a combination tour and will use their own transport to attend CTF, with negligible wider economic impacts.

To estimate the wider economic contribution of the CTF, PwC has used a tourism multiplier from the international literature. When examining tourism multipliers they often display very substantial international variations depending on the structure of the economy in which the tourism activity takes place or the spending patterns of the recipients of these expenditures. The size of the economy can also explain differences between the Caribbean countries listed in Figure 11. The larger and arguably more diversified economies such as Jamaica and the Dominican Republic show considerably higher multipliers when compared to small countries and economies such as the British Virgin Islands and the Cayman Islands, which indicates the linkages to other sectors are more developed in larger economies. In this case, the approach outlined above also had to be adjusted to reflect the fact that direct economic contribution of CTF is negative, and indirect and induced impacts were estimated using data on the supplier base.

Figure 11

Tourism multipliers – selected countries

Country	Size of multiplier	Country	Size of multiplier
Cayman Islands	0.65	Antigua	0.88
Bermuda	1.03 - 1.09	Jamaica	1.23 - 1.27
Dominican Rep.	1.2	Bahamas	0.78-0.79

Source: Meyer (2006) *Caribbean tourism, local sourcing and enterprise development: review of the literature*, Centre for Cultural Change, Sheffield Hallam University

Figure 12

CTF: Current economic impacts

	Net present value to GVA (\$m)	Impact in terms of employment – operational (FTEs)
(a) Direct impacts	(0.8)	90
(b) Indirect and induced impacts	3.3	45
(c) Wider impacts	8.6	155
Gross impacts (a) + (b) + (c)	11.1	290

Source: PwC analysis

Note figures may not sum due to rounding

3.4. Summary

This Section has estimated the expected current economic impacts of the CTF.

The scale of the expected impacts on the Cayman Islands economy has used two indicators: economic output, as measured by GVA, and employment. The analysis is based on information and projections provided by the CTF and publically available sources, notably CIG statistics.

The current impact of the CTF is estimated to be an increase in GVA of \$11.1m for 2012. Expressed in terms of employment effects, 290 FTEs are associated with the CTF.

However, in order to understand the true value of CTF to the Cayman Islands economy, one must estimate impacts against the counter-factual scenario; that is, what is the additional value of CTF compared to a scenario in which CTF is no longer operating. Accordingly, Section 4 below considers the incremental impact of CTF, and also considers anticipated structural changes in the Cayman cruise industry.

4. Potential future contribution of the CTF – alternative scenarios

4.1. Introduction

In considering the potential future economic contribution of the CTF, it is important to compare what is expected to happen if the CTF does not continue to receive a subsidy from CIG with what would happen if it were continued. Clearly, a key consideration is what effect the subsidy has on the CTF's ability to continue to operate. Once this has been assessed, it is important to consider how tourist and other spending is likely to be affected. For example, if the CTF was closed, any tourism spend that would simply be switched elsewhere in the Cayman Islands economy would not represent an incremental economic impact of the CTF on the Cayman Islands economy.

Furthermore, in light of CTF's close links with the cruise tourism industry, it is important to consider the potential implications of the proposed redevelopment of the Grand Cayman Cruise Berthing Facility (the "Cruise Port") on CTF's financial performance and corresponding economic impacts.

4.2. Approach

PwC's approach has considered the impact of the CTF on two indicators of economic activity. The economic output as measured by GVA is estimated alongside the total number of jobs supported by the expected outcomes from the CTF. This provides an estimate of the 'gross' impact associated with the CTF.

To estimate the 'net' impact of continuing to pay a subsidy to the CTF, the expected future economic outcomes with the subsidy are compared to a 'counterfactual' scenario which assumes that the CTF ceases to receive a subsidy and operations are run-down over a twelve month period. The scenarios are summarized in Figure 13.

Figure 13

Summary of scenarios

	Without Cruise Port redevelopment	With Cruise Port redevelopment
Without subsidy	Scenario 1: CIG subsidy discontinued and CTF operations run-down to closure over a twelve month period	
With subsidy	Scenario 2a: the CTF continues to receive a subsidy	Scenario 2b: the CTF continues to receive a subsidy and the Cruise Port is redeveloped

Source: PwC

As illustrated in Section 3, CTF has limited direct, indirect and induced economic impacts. Therefore, the key determinant of the net economic impact of the CTF is its wider effect on enabling and encouraging greater visitor spending in Cayman.

Accordingly, this section of the report examines the link between CTF and other visitor spending under different the scenarios. In particular, PwC considers the expected behavior of:

- Cruise passengers and other visitors in the absence of the CTF and/or following a redevelopment of the Cruise Port;
- Cruise lines in the absence of the CTF and/or following a redevelopment of the Cruise Port; and
- Tour operators in the absence of the CTF and/or following a redevelopment of the Cruise Port.

For the purposes of considering future impacts of the CTF, the fifteen year period to 2027 has been selected as an approximation of the useful economic life of the key assets of the CTF. Accordingly, the potential future economic impacts have been estimated over the period to 2027.

Finally, standard practice in economic impact analysis is to convert the economic impacts that accrue over the lifetime into present values. To achieve this, a discount rate is used to convert future GVA into present values.

The discount rate outlined under the Cayman Islands' Framework for Fiscal Responsibility⁵ ('FFR') is 3½%, and this discount rate is used as a key assumption in the analysis. An alternative discount rate can be derived from the cost of capital – or the interest rate at which CIG can borrow – and reflects the cost to government of funding the CTF. At present the government yield on 10 year borrowing stands at approximately 5½%. The sensitivities of the analysis are considered later in this Section of the report.

4.3. Without a subsidy for CTF – Scenario 1

4.3.1. Impact on CTF operations

As set out in Section 2.3, the CIG subsidises annual operating losses of CTF, as well as the debt service costs.

As guarantor for the bulk of CTF's debts, CIG retains this obligation irrespective of whether CTF continues to operate. However, CIG could choose to cease funding of CTF's ongoing operating losses.

In such circumstances, CTF would immediately become financially unviable and the directors would be obliged to either find a new source of funding, sell the company as a going concern or cease trading and have the operations wound up.

Based on current financial performance, it is unlikely that it would be possible to secure alternative private sector funding or achieve a sale as a going concern. As such, the most likely outcome is closure of the CTF. This closure would be likely to involve:

- A run-down period for operations, funded by CIG, during which time the turtles and other wildlife are either relocated to alternative facilities, or introduced into the wild;
- The outstanding debt obligations of CTF would be likely to be accelerated, requiring an immediate repayment by CIG as guarantor; and
- CTF's real estate and plant & machinery assets would be auctioned off.

For the purposes of the economic impact study, it is not necessary to quantify the run-down costs and likely sale proceeds for CTF. If the CTF real estate assets are subsequently redeveloped, this may have a positive economic impact in the future. However, given the lack of any existing plan for redevelopment it is not possible to ascertain these impacts with any degree of certainty and these impacts are therefore not included in our analysis.

For economic modelling purposes, PwC has assumed that the closure of CTF would take 12 months to complete.

4.3.2. Impact on tourism spend

4.3.2.1. Cruise lines

In order to understand the possible impact of the CTF it is necessary to consider what the likely reaction of the cruise lines might be.

PwC considers it unlikely that the cruise lines would decide to remove the Cayman Islands from their itinerary as a direct result of the closure of CTF. This is particularly the case given that the Cayman Islands' key attractions as a cruise destination would still remain; namely, the Cayman Islands' location en-route for Western Caribbean itineraries, low crime, good amenities at disembarkation point and a strong overall breadth of water related attractions.

Notwithstanding the continued attraction of the Cayman Islands without the CTF, as noted in Section 3.3.5.1.1, CTF represents approximately 20% of the total tour industry in the Cayman Islands and is therefore an important source of margin for the cruise lines, which mark up CTF ticket sales by c.100%.

With the closure of CTF, the cruise lines would seek to recover profitability possibly through sales to alternative attractions, or through downward pressure on wholesale prices for remaining attractions.

⁵ Framework for Fiscal responsibility, a set of fiscal and financial reporting guidelines agreed between the Cayman Islands Government and the UK Foreign and Commonwealth Office in November 0211

As outlined further below, there are limited realistic alternative attractions in the Cayman Islands for price-conscious family groups. And many of these, such as Stingray City, are facing increasing capacity constraints. As a result, it is likely that the cruise lines would not be able to replace the margin they earn from sales of tickets for tours to the CTF with ticket sales elsewhere.

Given the uncertainties regarding likely cruise line behaviors, it is not possible to determine the effect on whole prices with accuracy, but equally it should not be ignored entirely.

Scenario 1 assumes that spending per visitor for those cruise passengers who buy tours will be on average 5% lower following closure of CTF. This assumption is intended to reflect expected reductions in average tour retail prices for passengers (refer to Section 4.2.2.2 below) and also lower wholesale prices to the cruise lines, which would seek to protect their own margins. The sensitivity analysis later in this report tests the significance of this assumption.

4.3.2.2. Cruise passengers

In order to understand the incremental impact of the CTF it is also necessary to consider the likely behavior of the main visitor group, cruise passengers, in the absence of the CTF.

For this purpose, PwC has considered the main alternative activities available to cruise passengers:

Existing attractions:

The most likely direct substitutes for price-conscious family groups would include Stingray City, the beach & snorkeling trips, and shopping and restaurants.

More expensive options, such as dolphinariums, submarine and helicopter tours and jewelry shopping also represent alternatives, albeit to a far lesser degree.

Based on feedback from ITOs and the DoT, attractions in the East of Grand Cayman, such as the Botanical Gardens or Pedro St James are not assumed to be realistic alternatives for the high volume family market, given they cater for relatively niche historical and botanical interests.

New attractions:

The possibility of a new, high volume family oriented attraction replacing CTF has been discussed with the DoT, the Ministry of T&D and tour operators. The general consensus is that it would be difficult to establish a commercially viable high volume alternative in light of the current price pressure from the cruise industry.

Overall, it is likely that in the absence of the CTF there would be a substantial amount of alternatives for existing attractions and activities, but there would also be some level of overall drop-off in shore excursions. Such drop-off is inevitable given that the realistic alternatives for CTF face capacity constraints and/or are water-sports based activities which may not be as accessible for some of CTF's current visitor base. ITO representatives interviewed estimated this drop off at around 25% of existing combination tours which include CTF. This means that 75% of the tours would continue, but substitute some other attraction for CTF.

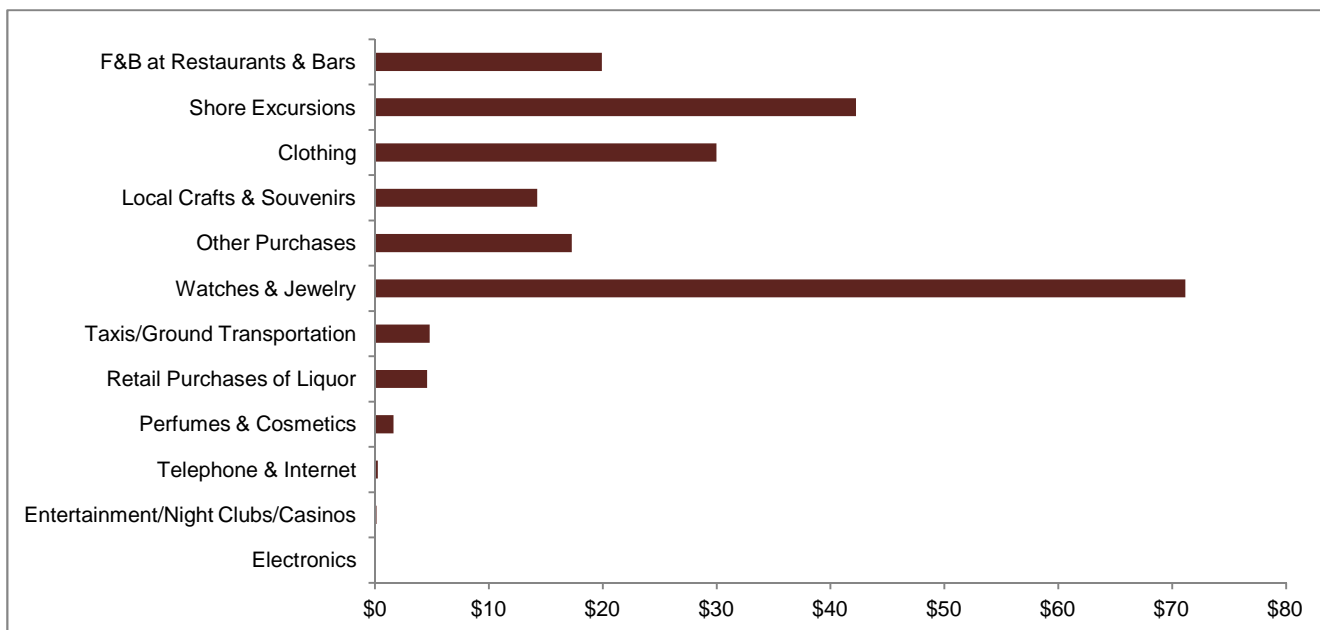
Accordingly, Scenario 1 assumes that 75% of the current CTF combination tour visitors would take-up an alternative tour in the absence of CTF, and that 50% of those that currently purchase a ticket to CTF alone would take-up an alternative tour. Those disembarking passengers who do not attend a tour are expected to spend on other categories of cruise visitor spend in line with the current trends.

As noted in Section 4.2.2.1, Scenario 1 assumes that overall spending by those cruise passengers who attend tours will be 5% lower following closure of CTF. The principal rationale for this assumption is that a major substitute for CTF tours would be visits to beach restaurants or other attractions with low / no admittance fees, thus shifting the overall pricing mix of tours downward.

Figure 14 provides an analysis of cruise visitor spend in the Cayman Islands.

Figure 14

Weighted cruise passenger spend in the Cayman Islands, by category



Source: Business Research and Economic Advisors, September 2012

Figure 14 illustrates that shore excursions, such as CTF, represent the second highest spending category after jewellery. The likely non-tour CTF substitutes identified above are F&B and beach trips (which involve ground transportation only). Accordingly, it is likely that the non-tour substitutes will generate significantly lower levels of tourism spend than CTF, based on statistics in the BREA Report⁶, PwC has estimated this spending differential at c.33%.

4.3.2.3. Stay-over and resident visitors

PwC has also considered the likely impact of a closure of CTF on the spending patterns of the current stay-over tourist and resident visitors to CTF. In particular, the focus has been on whether these visitors are likely to substitute other activities in the Cayman Islands.

Interviews with the DoT indicate that stay-over tourists in the Cayman Islands are often repeat visitors and relatively high spenders. As such, they are less likely to be operating on a set budget and foregoing visits to alternative attractions to visit the CTF. Accordingly, it is less likely that the closure of CTF would result in these visitors switching their vacation spending to alternative attractions in the Cayman Islands that they would not otherwise visit. In summary, although there would be some substitution effect, this is likely to be relatively small and most likely on lower cost activities such as beach visits or F&B.

For residents it is expected that the overall volume of other spending would be unchanged following a closure of CTF. The most likely result of closure of the CTF is that residents forego this expenditure and save the money. Particularly, in the case of expatriate residents this will mean that the foregone revenue will eventually leak out of the Cayman Islands economy.

⁶ ECONOMIC CONTRIBUTION OF CRUISE TOURISM TO THE DESTINATION ECONOMIES, Business Research and Economic Advisors, September 2012, Volume II, Page 66.

4.4. With a continued subsidy of CTF – Scenarios 2a and 2b

This part of the Section describes the two scenarios that have been developed to show the potential impact of if the CTF continues to receive a subsidy.

4.4.1. Scenario 2a – No development of Cruise Port

Scenario 2a considers the likely economic impact of CTF assuming that the CIG continues to subsidize its operating losses, but makes no investment in enhancing the Cruise Port during the review period.

The main driver of future economic impacts will be the level of cruise related visitors to CTF. Despite worldwide and regional growth in the cruise industry, the overall level of cruise visitor to the Cayman Islands fell c.8.3% between 2008 and 2012 and is expected to fall again for 2013.

The main reason cited for the Cayman Islands' falling share of cruise tourism is the lack of adequate berthing facilities. This is particularly relevant for future forecasting given that there is an industry-wide shift toward larger 'mega-ships' carrying 5,000 passengers or more, which cannot be accommodated by Cayman's existing mooring and tendering arrangements.

Accordingly, in the absence of a Cruise Port redevelopment the downward trend can be expected to continue. In practice, the passenger volume reductions do not follow a steady trend, but are instead characterized by step changes as decisions are made to remove the Cayman Islands from certain ship's itineraries. This was the case in 2012, when the loss of two major routes led to an 8% reduction in Cayman Islands cruise visitor numbers.

As the timing of these step changes is very difficult to anticipate, the base assumption included in Scenario 2a is for a consistent 0.4% annual reduction in passenger numbers. This is in line with the average decline over the past ten years.

As illustrated in Figure 3 above, CTF's share of the cruise market has been relatively consistent over the past three years and in Scenario 2a this is assumed to remain steady.

With respect to stay-over tourism, the DoT anticipates a strong level of growth over the next three years, resulting from improved marketing, better air-lift and new hotels coming on-stream. After this point, growth stay-over tourism could potentially be restricted by the long-delayed upgrade of the Owen Roberts International Airport and associated volume constraints. In light of the potential medium term constraints on growth, Scenario 2a assumes overall growth during the study period to 2027 will average at 0.2% p.a., in line with the long term historical trend. CTF visitor numbers as a proportion of stay-over visitors are assumed to remain constant over that period.

4.4.2. Scenario 2b – Development of Cruise Port

The redevelopment of the Cayman Islands cruise terminal and berthing facilities, in George Town Grand Cayman, has been a strategic objective of CIG for over ten years.

At present, cruise ships visiting Cayman are obliged to moor in the George Town harbor and tender passengers into shore, incurring significant expense and time delays. This can be addressed by the construction of 'finger piers' into the harbor and some additional dredging to allow dockside berthing.

The Cayman Islands' main competitors in regional cruise tourism have either already put in place alongside berthing arrangements or are in the process of doing so. To date, the Cayman Islands' favoured location for Western Caribbean cruises has largely protected its cruise market share, despite the lack of adequate berthing. However, as noted above, Grand Cayman has recently been removed from itineraries as a result of this issue. Moreover, George Town is unable to accommodate the new classes of 'mega-ship' due to lack of adequate berthing facilities.

Accordingly, the Ministry of T&D has recently commenced a new procurement process with a view to finalizing the redevelopment of the Cruise Port within three years. The initial focus of this redevelopment is defensive; that is the CIG is keen to ensure no further cruise market share is lost as a result of inadequate berthing.

In the medium term, the redevelopment is also intended to deliver some gains in overall cruise visitor numbers, by increasing the overall berthing capacity and making the Cruise Port more attractive to cruise lines and in particular cruise mega-ships.

Realistically, it is not expected that a redevelopment would generate the peak level of visitor numbers achieved in 2006 of 1.9m. In fact, that peak year was largely the result of traffic being diverted as a result of hurricane disruption in Cozumel, Mexico. However, CIG targets a medium term growth in cruise passenger numbers to approximately 1.6m – 1.7m per annum, as compared to the current level of c.1.4m.

For the purposes of Scenario 2b, PwC has modeled annual passenger number growth of 1% per annum to reflect the impact of the new berthing facilities. Once again, while the actual impact may be more ‘step-change’ in nature, rather than a steady annual increase, the overall impact should broadly equate in economic terms.

For the CTF, another significant impact of the proposed Cruise Port development is the expected affect on embarkation and disembarkation times.

At present, based on feedback from ITOs and the DoT, PwC understands that cruise visitors to the Cayman Islands currently face total waiting time of c.1 hour for disembarkation and embarkation. Where rough seas have made mooring at George Town infeasible, this waiting time is significantly prolonged.

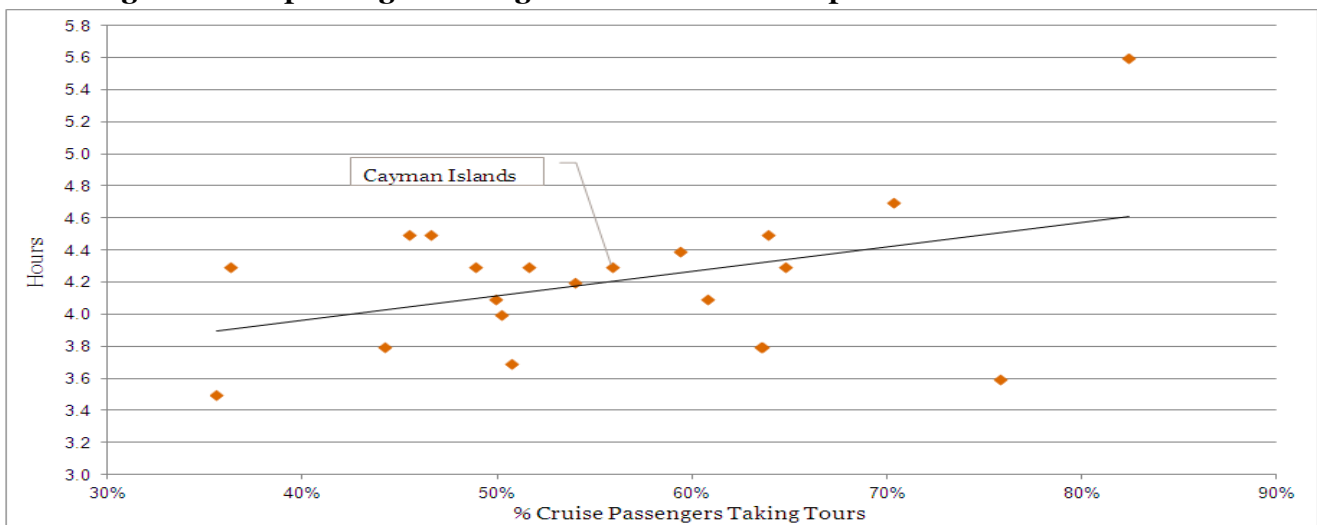
Following redevelopment of the Cruise Port to an alongside berthing facility, these delays would be largely avoided.

Based on BREA data, cruise visitors to the Cayman Islands currently spend c.4.37 hours visiting Grand Cayman. Accordingly, the avoidance of a 1 hour delay would represent a significant proportionate increase in actual time available to spend in the destination. ITOs interviewed stated that this can be expected to have a significant ‘step-change’ impact on the level of shore excursions taken-up by cruise visitors of up to 25% because tours, such as the CTF, often take up to c.3 hours of a visitors time.

This view is supported by Figure 15 which charts the proportion of cruise visitors taking up tours based against the time spent ashore for various regional cruise destinations. The ‘line of best fit’ indicates a correlation between time spent ashore and the level of take-up of shore excursions.

Figure 15

Percentage of cruise passengers taking tours based on time spent ashore



Source: Business Research and Economic Advisors, September 2012

7 ECONOMIC CONTRIBUTION OF CRUISE TOURISM TO THE DESTINATION ECONOMIES, Business Research and Economic Advisors, September 2012, Volume I Page 64.

A 25% increase on the current level of take-up of tours in the Cayman Islands would result in overall tour take-up of c.70%. Based on the BREA statistics, levels of shore excursion take up at 70% and higher are only achieved in major mainland destinations, which generally have overnight stays, such as Belize and Costa Rica. As such, it appears unlikely that the Cayman Islands would achieve this level of tour take-up, without overnight stays and a major new attraction.

Accordingly, for the purposes of determining the impact of the Cruise Port redevelopment in Scenario 2b, PwC assumes a 15% increase on the current level of cruise passengers taking up tours as a result of quicker disembarkation and embarkation. This would bring the overall level of shore excursion participation in the Cayman Islands up to 65%.

In addition to the indirect and wider impact of the Cruise Port redevelopment, Scenario 2b must also consider the possible impact on the CTF financial performance and associated direct economic impacts.

In order to consider impact on CTF financial performance, PwC has estimated the total fixed cost base of CTF (excluding staff costs) to be \$4.9m annually, based on 2012 performance. Total variable costs per customer are, therefore, estimated at \$6.04 per customer based on 2012 performance.

Under Scenario 2b over the review period to 2027, the anticipated increasing overall number of cruise visitors and increasing take-up of tours is expected to begin to generate positive direct economic impacts for CTF by 2020. However, assuming there are no changes to the CTF scale of operations or the pricing mix, even after allowing for the increased visitor revenues, CTF is expected to continue to incur operating losses throughout the review period.

4.5. Estimating the potential future economic impacts of the CTF

In order to assess the incremental effect of the CTF, it is important to consider the expected pattern of tourist spending if there is no CTF. Only by comparing this assessment with the expected impacts ‘with the CTF’ is it possible to understand the additional economic value provided by the CTF.

In order to establish the net (incremental) impact of the subsidy for CTF this section compares the total GVA and job impacts estimated in the two scenarios *with the subsidy* (**Scenarios 2a and 2b**) after deducting the level of economic activity that would have been achieved under the counterfactual scenario in which the CTF closed, *without the subsidy* (**Scenario 1**).

4.5.1. Scenario 2a – CTF with subsidy (no Cruise Port redevelopment)

This part of the Section provides an assessment of the expected economic impacts of the CTF if it continues to receive a subsidy from CIG, but there is no port redevelopment.

The analysis uses a similar approach to estimate the economic impacts as that used in Section 3. As before, the analysis uses data provided by the CTF and tourism statistics as its starting point and incorporates assumptions developed by PwC. The GVA and employment figures below are stated net of the economic activity under Scenario 1; that is, after deducting the level of GVA and employment that would have been achieved had the CTF closed within twelve months.

Figure 16**CTF: Net expected economic impacts with continued subsidy but no Cruise Port development - (Scenario 2a stated net of Scenario 1)**

	Net present value to GVA (\$m)	Impact in terms of employment – operational (FTEs)
(a) Direct impacts	-9.7	90
(b) Indirect and induced impacts	38.5	45
(c) Wider impacts	44.2	68
Gross impacts (a) + (b) + (c)	73.0	203

Source: PwC analysis

Note figures may not sum due to rounding

4.5.2. Scenario 2b – CTF with subsidy (Cruise Port redevelopment)

This part of the Section provides an assessment of the expected economic impacts of the CTF if it continues to receive a subsidy from CIG and there is also port redevelopment.

The analysis relies on a similar approach for estimating the economic impacts as used in Section 3. As before, the analysis uses data and assumptions provided by the CTF as its starting point. The GVA and employment figures below are stated net of the economic activity under Scenario 1; that is, after deducting the level of GVA and employment that would have been achieved had the CTF closed within twelve months.

Figure 17**CTF: Net expected economic impacts with continued subsidy and Cruise Port development - (Scenario 2b stated net of Scenario 1)**

	Net present value to GVA (\$m)	Impact in terms of employment – operational (FTEs)
(a) Direct impacts	-	90
(b) Indirect and induced impacts	40.30	48
(c) Wider impacts	180.00	465
Gross impacts (a) + (b) + (c)	220.20	603

Source: PwC analysis

Note figures may not sum due to rounding

4.6. Sensitivity analysis

The penultimate part of the Section presents the sensitivity of the results of the quantitative analysis to the key assumptions that underpin them.

Figure 18 summarizes the five key sensitivities that have been tested as part of the analysis. It shows the assumptions that have been used in the base case, the sensitivities that have been tested and the reasons why the sensitivities were felt to be appropriate.

Figure 18

Summary of key sensitivities

Sensitivity	Base case assumption	Sensitivity tested	Reason for sensitivity analysis
Impact of CTF on disembarkation rates	2.5%	1%	The level of cruise passenger disembarkation is a significant driver of economic impacts. At 90%, disembarkation in the Cayman Islands is relatively high in the regional context. The extent to which this is driven by attractions such as CTF is uncertain. The base case Scenario 1 assumption is that 2.5% of disembarkation is the result of passengers wishing to visit CTF. This should be viewed in the context of 11.3% of passengers visiting CTF overall. The sensitivity considers the impact if only 1% of the disembarkation level is driven by CTF.
Impact of Cruise Port redevelopment on disembarkation rates	2.5%	1%	The base case assumption in Scenario 2b is that the level of disembarkation of cruise passengers at the Cayman Islands would increase by 2.5% following the redevelopment of the Cruise Port, principally reflecting the reduced disembarkation and embarkation times. The sensitivity considers the impact if there is only a 1% increase in disembarkation.
Level of substitution of CTF tours	50% CTF only 75% combined tours	75% CTF only 90% combined tours	In the event of the closure of CTF, there would be a degree of substitution of other available tours by cruise and stay-over visitors. The base case assumptions are based on interviews with ITOs and the DoT. The sensitivity considers the impact if this level of substitution were increased to 75% for the portion currently taking CTF only tours and 90% for those currently taking combined tours.
Level of passenger number growth	-0.4%; 1%, with Cruise Port redevelopment	-1%; 0.5%, with Cruise Port redevelopment	Scenarios 1 and 2a include the baseline assumption that cruise passenger numbers to the Cayman Islands will continue to fall at the long term trend rate of 0.4% per annum. Whereas Scenario 2b assumes cruise passengers will rise annually at 1%, as a result of the Cruise Port redevelopment. The sensitivity considers the impact if these annual growth levels were reduced to -1% and 0.5% respectively.
Discount rate	3½%	5½%	The analysis has been based on a discount rate 3½% which is taken to reflect the social rate of time preference (and is referenced in the FFR). As sensitivity, consideration has been given to the effect of using a discount rate which reflects CIG's current cost of capital. This is taken to be 5½%.

Source: PwC analysis

Figure 19 below summarizes the results of the sensitivity analysis. The top row of the table presents the expected NPV of the stream of GVA associated with each of the Scenarios 2a and 2b that have been analyzed.

Each subsequent row shows the **change** in the expected NPV as a result of the sensitivity. The key points to note are that:

- The results are highly sensitive to the level of disembarkation of cruise ship passengers. As a result, the degree to which CTF is an influence in convincing cruise passengers to disembark in Cayman is critical in terms of its economic value to the Cayman Islands.
- Similarly, the impact of the Cruise Port development, and its corresponding impact on the performance of Cayman Islands tourist attractions, will be heavily influenced by the degree to which the alongside berthing contributes to a higher level of cruise passengers disembarking.
- The extent of substitution of tours currently including CTF for other alternative tours in the event of CTF closure is another major driver of economic impacts. In practice, this level of substitution will be determined by capacity and affordability considerations, as well as the extent to which alternative tours can offer a compelling attraction to family groups.

- Variation in passenger growth rates will have an impact across the two Scenarios and in particular for Scenario 2b, where the success of the redeveloped Cruise Port will be important.
- Given that much of the benefits from the Cruise Port redevelopment are expected to accrue in the later years, a change in the discount rate assumption has a significant effect on the level of GVA estimated.

Figure 19**Impact of key sensitivities on expected GVA (\$m, NPV)**

Sensitivity	With subsidy but no Cruise Port redevelopment (Scenario 2a)	With subsidy and Cruise Port redevelopment (Scenario 2b)
Base case GVA	73.0	220.0
Disembarkation driven by CTF	-12.4	-12.4
Disembarkation driven by Cruise Port	-	-14.9
Substitution of CTF tours	-15.6	-15.6
Passenger growth rate	-3.1	-4.8
Discount rate	-9.3	-33.0

Source: PwC analysis

5. Conclusions and recommendations

5.1. Introduction

This section presents PwC's overall assessment of the historical economic impact of the Cayman Turtle Farm as well as its assessment of its potential future economic impact under alternative scenarios.

5.2. Economic impact of Cayman Turtle Farm

While loss making at the operating level, the CTF nevertheless provides some important economic support to the Cayman Islands cruise tourism industry.

To an extent there is a symbiotic relationship between CTF and the cruise lines, as CTF represents the second most popular attraction in the Cayman Islands (and most popular land-based attraction) and is therefore a significant draw in the cruise lines' marketing of their itinerary, as well as a significant source of the cruise lines' all-important margin from tour sales in the Cayman Islands.

The CTF also provides support to the tour industry. The level of Caymanian employment in the ITO industry is estimated at c.60% across the year, varying between busy and slow seasons. As a relatively low skilled and flexible source of employment, any permanent reduction of employment in the ITO industry would be likely to have long term implications for the level of unemployment in the Cayman Islands.

The scale of the expected impacts on the Cayman Islands economy has used two indicators: economic output, as measured by GVA, and employment.

The current impact of the CTF is estimated to be an increase in GVA of \$11.1m. Expressed in terms of employment effects, 290 FTEs are associated with the CTF.

However, in order to understand the true value of CTF to the Cayman Islands economy, one must estimate impacts against the counter-factual scenario; that is, what is the additional value of CTF compared to a scenario in which CTF is no longer operating.

In order to establish the net (incremental) impact of the subsidy for CTF this Figure 20 below compares the total GVA and job impacts estimated in the two scenarios *with the subsidy* (**Scenarios 2a and 2b**) after deducting the level of economic activity that would have been achieved under the counterfactual scenario *without the subsidy* (**Scenario 1**).

The economic impacts below are estimated over the fifteen year period to 2027, discounted to net present value.

In addition to the economic impacts, the CTF also serves various environmental roles. Part of the original rationale for establishing the turtle farm in 1968 was to provide farmed turtle meat and thereby reduce the widespread poaching of wild turtles for meat in the Cayman Islands. Furthermore, since that time CTF has also released thousand of turtles into the wild, helping revive the local populations. Accordingly, closure of CTF could be expected to result in an increase in poaching activity and the end of the turtle rearing and release programs.

Figure 20

CTF: Net expected economic impacts (Scenarios 2a and 2b stated net of Scenario 1)

		Net present value to GVA (\$m)	Impact in terms of employment – operational (FTEs)
Scenario 2a	With subsidy – no Cruise Port redevelopment	73	203
Scenario 2b	With subsidy – Cruise Port redevelopment	220	603

Source: PwC analysis

The economic impacts outlined above should be considered in the context of CIG’s ongoing subsidy of operating losses, which, at approximately \$4m per annum, equate to a net present value of \$40m over the fifteen year period. In determining the value-for-money of the subsidy, the CIG should consider whether its \$40m ‘investment’ is generating sufficient ‘returns’ in terms of economic benefits. This assessment should not be made in isolation, but bearing in mind alternative subsidy options for cruise tourism such as, for example, subsidization of cruise berthing fees. CTF’s conservation role discussed above and the cultural/social value of CTF will also be relevant in these considerations.

The main observations to be drawn from the analysis are:

- Overall, CTF clearly has a number of linkages for the cruise and tour industry in the Cayman Islands. Together with attractions such as Stingray City, it offers a unique experience for cruise visitors, which is critical in light of the repetition of attractions in many competitor destinations, such as dolphinariums. As a result, the wider economic impacts of CTF are substantial.
- While CTF has also a somewhat symbiotic relationship with the cruise lines, its presence in Cayman is not likely to be the deciding factor in cruise lines’ decisions to include the Cayman Islands on their itinerary.
- In the absence of a redevelopment of the Cruise Port, the ongoing subsidy of operating losses may still be justifiable in the context of the overall CTF economic impacts. However, without a new Cruise Port an even more rapid decline in cruise tourism than expected could quickly undermine the rationale for the ongoing subsidy.
- In the context of a redevelopment of the Cruise Port and a wider strategic tourism plan to maximize Cayman Islands’ offering to the cruise industry, CTF’s long term positive economic impacts could be substantial. In this scenario, the rationale for the ongoing subsidy would be clear, particularly if it formed part of the overall cruise tourism strategy.

5.3. Recommendations

Based on its analysis and findings as documented in this report, PwC recommends the following:

- As part of the business case development for the new Cruise Port, CIG should consider the existing and potential new cruise tourism attractions in Grand Cayman in order to develop an overall strategic plan to maximize the Cayman Islands’ benefits from cruise tourism, incorporating the CTF.
- Feedback from the DoT and ITOs indicates that a significant reduction in the scale of CTF operations would not have a significant detrimental impact on tourism demand for the attraction. As such, CTF may wish to consider whether further major structural change, in addition to the recent restructurings, could be carried out to reduce the overhead and payroll burden and reduce losses. Similarly, CTF could consider the sale of redundant or underused assets.
- PwC understands that, while there are some bottlenecks in the tour, CTF’s overall visitor numbers represent only a fraction of its operating capacity. One option outlined above is to effect a major

restructuring to reduce the size and footprint of operations. Alternatively, changes to pricing mix could possibly be used to drive greater visitor volumes and generate F&B and retail sales growth. This would no doubt require some cooperation from the cruise lines in terms of their retail pricing and marketing enhancements.

Appendix A. - Engagement Letter

Appendix B. - List of documents consulted

	Document
1	Caribbean tourism, local sourcing and enterprise development: review of the literature, Centre for Cultural Change, Sheffield Hallam University, Meyer (2006)
2	CIG Economic and Statistics Office, statistical compendiums 2006 - 2010
3	ECONOMIC CONTRIBUTION OF CRUISE TOURISM TO THE DESTINATION ECONOMIES, Business Research and Economic Advisors, September 2012
4	Cayman Turtle Farm, Audited Annual Financial Statements and Monthly management accounts 2005 – 2012
5	Cayman Turtle Farm, Breakdown of ticket revenues and combination ticket analyses 2006/7 – 2011/12
6	Department of Tourism, Analyses of visitor numbers and spending patterns
7	Cayman Turtle Farm, Employee breakdowns
8	Cayman Turtle Farm, Outstanding Debt Schedule
9	PMFL Financial Regulations (2004)
10	Public Management and Finance Law (Revised)
11	Time Series Analysis, Hamilton, J (1994)
12	The Cayman Islands' 2010 Census of Population & Housing Report
13	The direct and indirect Contributions of Tourism to Regional GDP: Hawaii, the Economic Research Organisation at the University of Hawaii Tian et al. (2011)
14	The Framework for Fiscal Responsibility agreed between the CIG and FCO on 23 November, 2011