UNIVERSIDAD DE COSTA RICA
INSTITUTO DE INVESTIGACIONES EN CIENCIAS ECONÓMICAS

FINAL REPORT

ANALYSIS OF THE ECONOMIC CONTRIBUTION OF RECREATIONAL AND COMMERCIAL FISHERIES TO THE COSTA RICAN ECONOMY

Prepared by Instituto de Investigaciones en Ciencias Economicas of Universidad de Costa Rica Sponsored by The Billfish Foundation

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San José, May 30, 2010
Ciudad Universitaria Rodrigo Facio

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Executive Summary

Background, Research Objectives and Methodology

1. The Billfish Foundation (TBF) is a U.S.-based nonprofit working worldwide to advance the conservation of billfish and associated species to improve the health of oceans and economies. TBF conservation programs are implemented through research and education. To this effect, in 2005 and 2006, TBF studied the economic contribution of sportfishing of billfish and other species in Los Cabos, Baja California Sur in Mexico, and found this activity generated high impact and added value to the local economy of the area. In the study, international anglers mentioned one of the most attractive countries to them was Costa Rica and that they were visiting the country to fish and thus contributing to the local economy.
2. Tourism is the number one generator of foreign currency in Costa Rica and, in particular, sportfishing is one of Costa Rica's specialized tourism sectors. However, the impact of this activity on tourism and the Costa Rican economy is not known including the contributions to the direct and indirect generation of foreign currency, investment, and direct plus indirect jobs. Commercial fisheries of these species also contribute to the national economy, and it is expected that with appropriate regulations, their harvest can be sustainable.
3. The University of Costa Rica (UCR) also has the mission to promote the conservation and sustainable development of the country's natural resources, including marine species.
4. The UCR and TBF signed an agreement in October 2008 (to be executed through Instituto de Investigaciones en Ciencias Económicas –IICE) to carry out a study of the economic contribution of marine sport and commercial fishing, especially of billfish, to Costa Rica. In addition, the firm Southwick Associates, Inc., headquartered in Florida, United States, was hired by TBF to coordinate design and methodology, management and monitoring of this research and to generate information regarding U.S. anglers' international travel activities and preferences. The results of this study, the first of its class given the level of depth and analysis, are expected to contribute to the design of policies for the conservation and sustainable use of these species.
5. The species selected and compared for the commercial fisheries study are those that attract sportfishing tourists to the country, namely: mahi-mahi (Coryphaena hippurus), sailfish (Istiophorus platypterus), striped marlin (sometimes known in Costa Rica as pink marlin (Tetrapturus audax)), blue marlin (known in Costa Rica as white marlin (Makaira mazara)), swordfish (Xiphias gladius), wahoo (Acanthocybium solandri), tuna ((Thunnus spp.), but mainly yellow fin tuna (Thunnus albacares)), snook (Centropomus spp), and tarpon (Megalops atlanticus). It is possible that black marlin (Makaira indica) is captured by the commercial fleet and included with the other species of marlin mentioned above.
6. Sportfishing mainly catches the same species, with the exception of swordfish as the catches are fairly low, and includes others such as sierra mackerel (Scomberomorus sierra), roosterfish (Nematistius pectoralis), jacks and amberjack (Carangidae Family), yellow tail or rainbow runner (Elagatis bipinnulata) and demersal species or groundfish such as groupers (Serranidae Family) and snappers (Lutjanidae Family). Appendix 1 provides a detailed description of the species considered in this study.

7. Since almost no information existed on tourism-based sportfishing economics (such as employment, indirect jobs, investment in facilities, production, taxes, and foreign income generation), the project included two on-site surveys to collect data. One survey was conducted in February and March 2009 of tourists entering Juan Santamaría and Daniel Oduber (Liberia) International Airports from the United States and Canada. The second survey was conducted of hotels and businesses in four geographic areas of the country in July and August 2009, for the purpose of collecting quantitative information on estimated income and investment by these facilities as a result of sportfishing.
8. To determine the value chain and economic contributions of specific commercial fisheries, economic examination secondary information sources were combined with industry interviews and expert criteria.
9. An econometric model was used to compare the effect of both activities on supply and demand in the national economy and, therefore, the Gross Domestic Product. The model is based on a series of assumptions and uses information collected from the surveys as well as secondary information obtained from national institutions.

Research results are summarized in three sections; the first focuses on sportfishing; the second analyzes commercial fisheries; and the third is a comparative analysis of these activities in terms of their economic contribution.

Main Results and Conclusions

10. Using an econometric model for 2008, a comparison was made of the effects on Costa Rica's Gross Domestic Product (GDP) if there were no sportfishing or commercial fishing activities for selected species. The effect studied is focused on supply (investment through gross capital formation) and demand (through consumption). The estimate concludes that the impact of commercial fisheries on economic activity is lower than that of sportfishing for the same species.
11. The impact of sports and commercial fishing activities on the national economy was estimated using econometric techniques, based on sectoral data obtained from primary and secondary sources. The following table summarizes the results obtained from the model under different assumptions and scenarios. The effects are interpreted in the sense of what would have happened in the national economy in 2008 in the absence of commercial harvests or sportfishing for the selected species. For comparison purposes, the illustration can be interpreted in a positive sense by inferring what is the contribution of these activities to the national production on variables such as supply, demand and taxes; this is the sense of the following interpretation:

    - The effect of sportfishing on the GDP was approximately US$599.1 million (2.13% of the GDP for 2008), while commercial fishing contributed US$527.8 million (1.88% of the GDP). In other words, sportfishing contributed about US$70 million more than commercial fishing, equivalent to 0.25 percentage points of GDP contribution.
    - It should be noted that the above effects cannot be aggregated. In other words, they cannot be added together to obtain a combined effect from

commercial and sportfishing on GDP as the estimates were obtaining by eliminating only one of the activities at a time.

- For investment (gross capital formation), it was estimated that sportfishing contributed US$279 million, while commercial fishing contributed US$16.6 million in 2008. One explanation for the difference is anglers are willing to spend thousands of dollars to catch a fish while commercial fishers try to use the most cost-efficient methods possible.
- Taking the overall average tax burden for Costa Rica of 13% (without any analysis of the effect of subsidies and similar issues), it was estimated sportfishing generated US$77.8 million in tax revenues for the country, while commercial fisheries contributed US$68.6 million.

Impact on Gross Domestic Product from the Elimination of Sport and Commercial Fishing of Selected Species in 2008 (x US $1,000)

Commercial Fishing	**W/comm. fishing**	**W/O comm. fishing**	**Absolute change**	**Percent change**
Gross Domestic Product	$28,141,491	$27,613,656	-$527,835	-1.88%
Gross Capital Formation	$6,813,218	$6,796,615	-$16,603	-0.24%
Consumption	$19,619.453	$18,476,031	-$1.143,422	-5.83%
Taxes (13% rate)			-$68,619	
Sportfishing	**W/ tourist expenditures**	**W/O tourist expenditures**	**Absolute expenditures**	**Percent change**
Gross Domestic Product	$28,141,491	$27,542,387	-$599,104	-2.13%
Gross Capital Formation	$6,813,218	$6,533,581	-$279,637	-4.10%
Consumption	$19,619,453	$18,488,495	-$1,130,959	-5.76%
Taxes (13% rate)			-$77,884	

Source: IICE with econometric model results

12. In terms of employment, the estimates for the Economically Active Population (EAP) in 2008 enabled inferring how many jobs would be needed to increase GDP by 1.88% resulting from the effect of commercial fisheries of the target species or, alternatively, 2.13% of GDP from sportfishing. These effects were estimated using total productivity of the factors assuming a natural employment rate for the EAP and a function of scaled constant yield production. The result is that sportfishing contributed 63,000 jobs and commercial fisheries 57,000 total jobs.
13. To learn the frequency, profile and expenditures of anglers in Costa Rica, a survey was taken of US and Canadian tourists at the Juan Santamaría and Liberia Airports in the months of February and March 2009. It was estimated that 22% of these tourists visited exclusively for fishing. Taking into account the total number of tourists entering the country each year, we were able to infer average spending by each tourist and his or her travel group. Prior to this estimate, the total number of anglers visiting Costa Rica in 2008 was inferred. The final result was 283,790 people. In addition, it was estimated that of these anglers, about 3,700 have their own boats in the country, whether permanently or temporarily. These anglers with their own boats spent approximately US$138 million on maintenance and operation in Costa Rica.
14. Expenditures made by these 283,790 anglers in Costa Rica were estimated. Total foreign currency income for Costa Rica in 2008 was approximately

US$467 million, of which US$138 million were expenses and investment (boats, fuel, repairs and maintenance, crews, insurance, taxes, accessories and furniture), US$329 million was spent on travel including lodging (US$119 million), restaurants (US$15.6 million), flights and fishing guides (US$88 million) and land transportation (US$6 million), among others. On the other hand, it was estimated that approximately US$105 million were spent outside Costa Rica prior to arrival for airfare or other travel expenses, though these dollars are not included in the economic analyses.

15. In order to obtain more precise information regarding anglers' expenditures for hotels and other businesses, a survey was administered to hotels and sportfishing businesses in the Caribbean, Central Pacific, South Pacific and North Pacific regions of Costa Rica. The survey was conducted between 17 August and 5 September 2009. To prepare the sample, information was used from Instituto Costarricense de Turismo (Costa Rican Tourism Board) and the Internet, and it was determined there are 438 businesses (hotels and others) in these areas, of which 239 cater to anglers, with 117 hotels and 122 others including fishing tackle retailers, marinas and guide services Later, 56 hotels and 79 businesses were selected at random. The statistical estimate for 2009 indicated that anglers spent US$110 million in these areas. Of these expenditures, approximately 30.2% was used for investment back into the businesses (gross capital formation), while the rest was used to cover common expenses (input, raw materials and salaries).
16. Using information from a survey conducted in the U.S. by Southwick Associates, Inc., it was estimated that approximately 7.5 million Americans fished outside their country in 2009. Of these, 3.6% visited Costa Rica. Among anglers visiting Costa Rica, 40% said they would have not visited the country if they could not fish. Based on an estimate of nearly 271,200 U.S. anglers, 40% represents 116,000 visitors per year and about US$135 million in tourism income for Costa Rica. In addition, these anglers said the main factor to determine satisfaction is 'quality of fishing', followed by 'relative peace and quiet' and 'fishing services, boat and crew quality'.
17. Commercial fishing in Costa Rica decreased from 4.4% of GDP in 2003 (approximately US$770 million of a US$17 billion GDP) to 3.9% in 2007 (US$1.024 billion of US$26 billion).
18. In particular, commercial fishing of the selected species decreased from 20% of the gross production value of commercial fisheries in 2003 (US$154 million) to 19% in 2007 (US$194 million).
19. The slight percentage decline of commercial fishing for the selected species could be partially explained by the ban on sailfish exports starting in December 2008. While the exports of the target species in 2005 totaled US$16.6 million, in 2008 exports decreased to US$8.1 million. The accumulated figure through May 2009 indicates exports of only US$149,000.
20. The report compares the economic impacts for fish species that are sought by both the recreational and commercial sectors. It does not attempt or claim to estimate the economic impacts generated by all commercial fishing activity in Costa Rica. The intent is to help Costa Rica better manage its fisheries resources by understanding the relative contributions of commercial and recreational fishing when both target the same species.
21. It is important to clarify that this project represents pioneer research in the field of Costa Rican sportfishing. There were no prior information sources available to

estimate sportfishing's contribution to the Costa Rican national economy. Important parameters such as incidence of sportfishing among tourists were not available. In the absence of data regarding the seasonal fluctuations in sportfishing participation, it was assumed that rates remain constant throughout the year. This may introduce a bias towards overestimation if that ratio was in fact lower during tourism's slow season. On the other hand, the study's exclusion of all tourists other than Canadian or American could bias the estimate downward. Until additional empirical studies become available implemented during different times of the year, it is not possible to assess the magnitude of these biases and their impact on the estimates.

Introduction

This report was originally developed in Spanish. All efforts have been made to translate this report into English without losing any of the intent or meaning of the original document.

Tourism has been the primary foreign income-generating activity for Costa Rica in recent years. One of the more popular tourist activities is sportfishing, especially for sailfish and marlin. Angler tournaments have largely adopted the use of circle hooks to reduce injury to fish and to assist in immediate release, thus helping to sustain valuable fisheries.

Commercial fishing for the same species targeted by anglers also produces economic benefits in terms of employment, investment and a national food source.

Until production of this report, the impact of sportfishing tourism on foreign currency income, capital formation, investment, employment and national production was unknown. No research is available on the contributions of commercial fisheries either. It would be desirable for both activities - sport and commercial fishing - to complement each other and to generate added value and wealth, maximizing the conservation of marine species and sustainable development.

The conservation of marine species is the primary goal of The Billfish Foundation (TBF)[1]. In 2005 and 2006, TBF undertook a similar study to determine the economic contribution of sportfishing in Los Cabos, Mexico. The results demonstrated the significant economic impact sportfishing tourism brings to the national and local economy.

In order to analyze the impact of both recreational and commercial fishing on the Costa Rican economy, Universidad de Costa Rica (UCR) and The Billfish Foundation signed a contract in October 2008 to initiate a cooperative research project.[2] The Instituto de Investigaciones en Ciencias Economicas (IICE), or Economic Sciences Research Institute, was the technical arm responsible for carrying out the research. The main objective of this project was to analyze the contribution

[1] It should be mentioned that TBF is a non profit, non governmental international organization dedicated to the conservation of nature and the environment, and in particular billfish and marine diversity around the world. TBF focuses on training and research to support the sustainable management of billfish including: marlin (Makaira indica, Makaira nigricans, Tetrapterus audax, among others), sailfish (Istiophorus platypterus), swordfish (Xiphias gladius) and their oceanic ecosystems, is based in the United States, has members in many parts of the world, and was founded in 1986. TBF is particularly interested in supporting the development of management plans and fisheries research (biological and socio-economic), to achieve the sustainable development of marine billfish species that are highly migratory and shared with the countries of the Central American Isthmus, for which it has signed cooperation agreement with Organization del Sector Pesquero y Acuícola del Istmo Centroamericano (OSPESCA).

[2] Appendix 1 contains a list of the selected species.

of sport and commercial fishing for billfish and other marine species to the Costa Rican economy. The secondary objectives were:

a. To quantify direct and indirect jobs, retail sales, tax contributions and other economic benefits generated by visiting anglers.
b. To cooperate in a survey with the Instituto Costarricense de Turismo (ICT), or Costa Rica Department of Tourism, of international anglers who visit Costa Rica, as well as businessmen and other experts to quantify the impact anglers have on the Costa Rican economy.
c. To design and execute an economic model to quantify the impact of sportfishing tourism on the Costa Rican economy.
d. To quantify direct and indirect jobs, retail sales, tax payments and, in general, the benefits of the economic activity generated by commercial fishing of billfish, tuna, snook, wahoo, tarpon and mahi-mahi in Costa Rica.
e. To coordinate with Instituto Costarricense de Pesca y Acuicultura (INCOPESCA), Banco Central de Costa Rica –BCCR- and other public and private entities for the collection of commercial fisheries data in Costa Rica, as well as to design surveys and interview experts within the value chain of this activity.
f. To design and execute an economic model to quantify the impact of commercial fisheries on the Costa Rican economy.

Given the limitations of available data, it was necessary to collect quantitative information through surveys and interviews of tourists in businesses and hotels associated with sportfishing activities. In addition, experts were interviewed to collect secondary information regarding commercial fishing for the selected species. Limited availability of literature on the topic made comparison with previous studies difficult. For this reason, the study was carried out as an exploratory analysis of commercial fisheries of specific species in Costa Rica.

The first survey was taken at the two main airports: Juan Santamaria and Liberia, and collected information using random sampling procedures from U.S. and Canadian tourists regarding their angling activities and expenses. The fieldwork was done in February, March and part of April 2009. The second survey, developed by the IICE, sought information from companies and hotels associated with sportfishing in Costa Rica. The IICE interviewed contacts in four regions of the country: North Pacific, Central Pacific, South Pacific and the Caribbean. To complement the information obtained from the surveys, the IICE designed a questionnaire for sportfishing experts in Costa Rica. These people were identified by the Conservation Director for TBF in Central America. The purpose of this latter survey was to gain a better idea of the issues facing sportfishing in Costa Rica.

Collecting this information enabled statistical estimates regarding how much anglers spend, businesses' income, investment and operating expenses. The data were used to calibrate an econometric model. This model explains the general balance of the Costa Rican economy and was designed by IICE to simulate proposed policies and provide economic forecasts. The theoretical and empirical specifications of the IICE model are detailed in Appendix 2.

This document consists of three main sections. Part I has three chapters, the first covering the results of an angler survey in the U.S. that identified anglers' motivations and preferences regarding international fishing destinations. Chapter 2 presents the results of the angler intercept surveys conducted at Costa Rica's two primary international airports. Chapter 3 presents the survey of hotels and other businesses serving anglers directly or indirectly in Costa Rica. Altogether, the results explain the marine sportfishing industry in Costa Rica.

Part II consists of two chapters and contains descriptions and economic statistics for the commercial fishing sector in Costa Rica for species commonly targeted by recreational anglers. This information is from secondary data sources. The fourth chapter describes commercial fisheries in Costa Rica and its management. Chapter five presents the value of harvests for the species of interests to this study, and value-added activities. It also lists the various transactions along the chain. In general terms, fishing activities are divided into a primary market where the product is received from the fishermen, then a secondary or wholesale market where processing and distribution occur, and finally the retail market where the final consumers ultimately obtain the final product, as well as export.

Part III compares the economic contributions of sport and commercial fishing for the species examined in this report. Estimates are presented using Gross Domestic Product (GDP), gross capital formation, balance of payments and generation of foreign currency. Also provided are results for employment, production, consumption, taxes and investment for commercial fishing and sportfishing. The economic contributions of commercial and sport fisheries are presented in Chapters 6 and 7 respectively, while Chapter 8 compares the net returns from each activity.

Part I

Sportfishing in Costa Rica: Perceptions and Economic Contribution

Chapter 1

Perception and Opinion of Sportfishing in Costa Rica Among U.S. Anglers

1.1 Costa Rica as a sportfishing destination according to perception and opinion of sportfishing in Costa Rica

Costa Rica is a world-class tourist destination based on its unique natural and social characteristics. Sportfishing occurs along both coasts and generates numerous jobs and other economic benefits as explained later in this report. To maintain and possibly grow the benefits received by sportfishing, it is necessary to know why Costa Rica is a popular sportfishing destination, and the needs of the sportfishing industry. The perceptions of anglers and industry experts were gathered and are reported here to help Costa Rica understand why anglers visit, and how the industry can be maintained or enhanced.

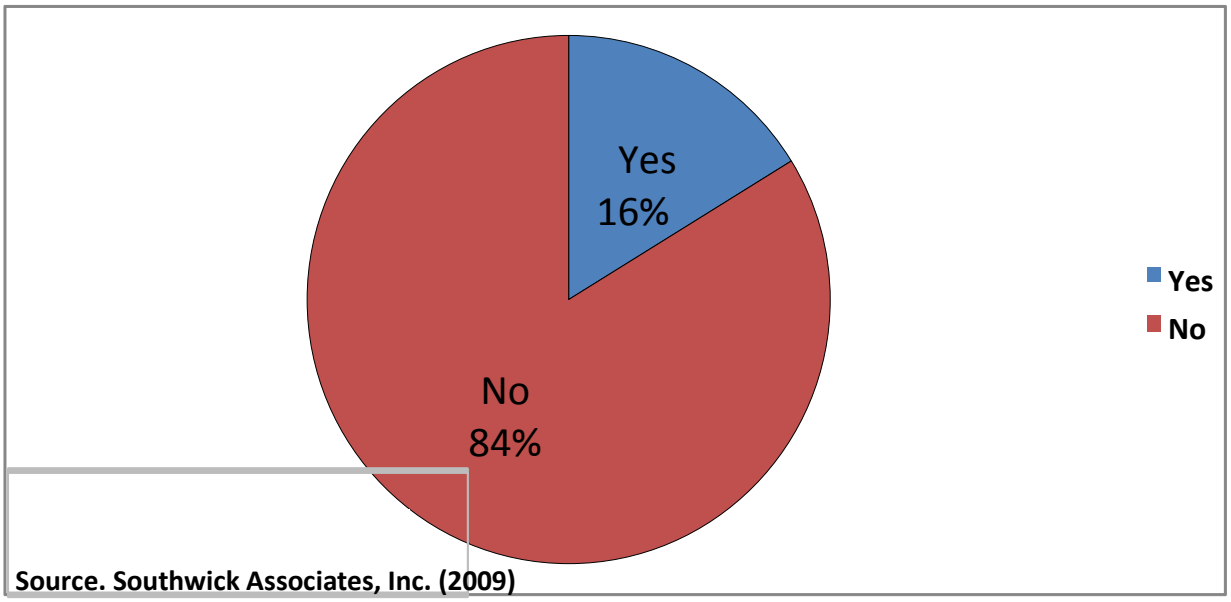
1.1.1 Costa Rica as sportfishing destination for US anglers

In October, 2009, Southwick Associates, Inc. conducted an online survey using its AnglerSurvey™ panel. Nearly 2,800 U.S. anglers completed surveys about their international fishing plans and activities. Responses were scientifically weighted to represent all U.S. anglers using a proprietary process developed by Southwick Associates, Inc. The results, based on an online poll, cannot be regarded as a purely random survey, and must be considered as best estimates only.

The survey inquired if anglers had fished outside of the U.S. in the past five years. Sixteen percent reported having done so (Figure 1). According to the U.S. Fish and Wildlife Service, 29.9 million people fished in the U.S. in 2006. Combined with recent research that indicates the total number of Americans who have fished at least once in the past five years (64.3 million),[3] it is speculated that 10.3 million American anglers have fished outside of the U.S. at least once in the past five years (16 percent of the 64.3 million anglers). The 10.3 million angler figure does not consider Americans who have fished outside of the U.S. but not within the U.S. during the past five years.

[3] American Sportfishing Association and the Association of Fish and Wildlife Agencies. Angler Trends: Finding New and Lapsed Anglers, Plus License Renewal Rates. The National Technical Report from the AFWA-ASA Fishing License Data Analysis Project. Sport Fish Restoration Multi-State Grant M-49-0. Produced by Southwick Associates, Inc. March 2007. Using results in this report, it was estimated that over 64 million Americans fished at least once in the past five years from 2001 to 2006, with assumptions that participation rates did not change over this time frame.

Figure 1: Have you fished in other countries within the past five years?



Source. Southwick Associates, Inc. (2009)

Anglers who indicated they had fished outside of the U.S. were then presented with additional questions. Of all anglers who fished outside the U.S., 3.6 percent reported Costa Rica as their most recent destination. The most preferred destination was Canada with 43 percent of U.S. anglers, which is not surprising given Canada's long, common border with the U.S. and the ease of travel between the two countries. Mexico was the second most common destination, followed by Caribbean destinations.

1.1.2 Estimated economic contribution of US anglers to Costa Rica

Using the data above, it is possible to develop a second estimate of the number U.S. anglers who fish outside of the United States each year. Table 1 reports 3.6% of U.S. anglers who fish outside of the U.S. do so in Costa Rica. The 2009 survey conducted at Costa Rica's major airports as part of this project estimated that 271,183 U.S. residents fished in Costa Rica that year. If we assume that these 271,183 visitors represent 3.6 percent of the United State's international anglers, there are at least 7.5 million anglers who leave the U.S. and fish in other countries annually.[4]

[4] The estimate of 3.6% represents the percentage of people who actively fish in the U.S. and have recently fished outside of the U.S. This estimate does not include U.S. residents who do not fish in the U.S., but may do so while visiting other countries. These people are not included in the 7.5 million estimate presented here.

Table 1. Where U.S. Anglers Fished Outside of the Country

	Percent
Canada	43.0%
Mexico, saltwater	16.3%
Other, please tell us where:	8.2%
Caribbean islands	7.4%
Mexico, freshwater	4.8%
Bahamas	4.0%
Costa Rica	3.6%
Europe	3.2%
Other Central American countries	2.0%
Asia	1.8%
South America, other	1.4%
Other	1.2%
Panama	1.0%
Africa	0.8%
Australia/New Zealand	0.6%
Brazil	0.4%
Pacific islands (except Hawaii)	0.2%
Total	100.0

Source. Southwick Associates, Inc. (2009)

We now have two estimates of the total number of Americans who travel to fish: 10.3 million (section 1.1.1), and 7.5 million (section 1.1.2). These estimates do not include Americans who may not fish within the U.S. but do so internationally. Given the rough nature of these two estimates, the difference is not great.

Trips are taken for many purposes, and fishing is not always the primary motivator. U.S. anglers were asked if they would have made the trip if they knew they would not be able to fish (Table 2). Canada has the highest rate of trips made primarily for fishing, with nearly three-fourths of anglers reporting they would not have visited if they could not fish. Many anglers appear to select Costa Rica for other reasons: 41 percent reported they would not have visited if they could not fish. Considering over 271,000 North American anglers visited Costa Rica in 2008, without fishing, Costa Rica could have expected 110,690 fewer visitors and seen tourism revenues fall by approximately $128.7 million in 2009.[5]

[5] This estimate is based on the economic impact figures produced as part of this project by the Universidad de Costa Rica's Instituto de Investigaciones en Ciencias Economicas. The economic impacts of these last visitors was calculated by simply reducing the economic impacts by the percentage of visitors that would elect not to visit Costa Rica if fishing were not available.

Table 2. Would you have visited that location if you could not go fishing?

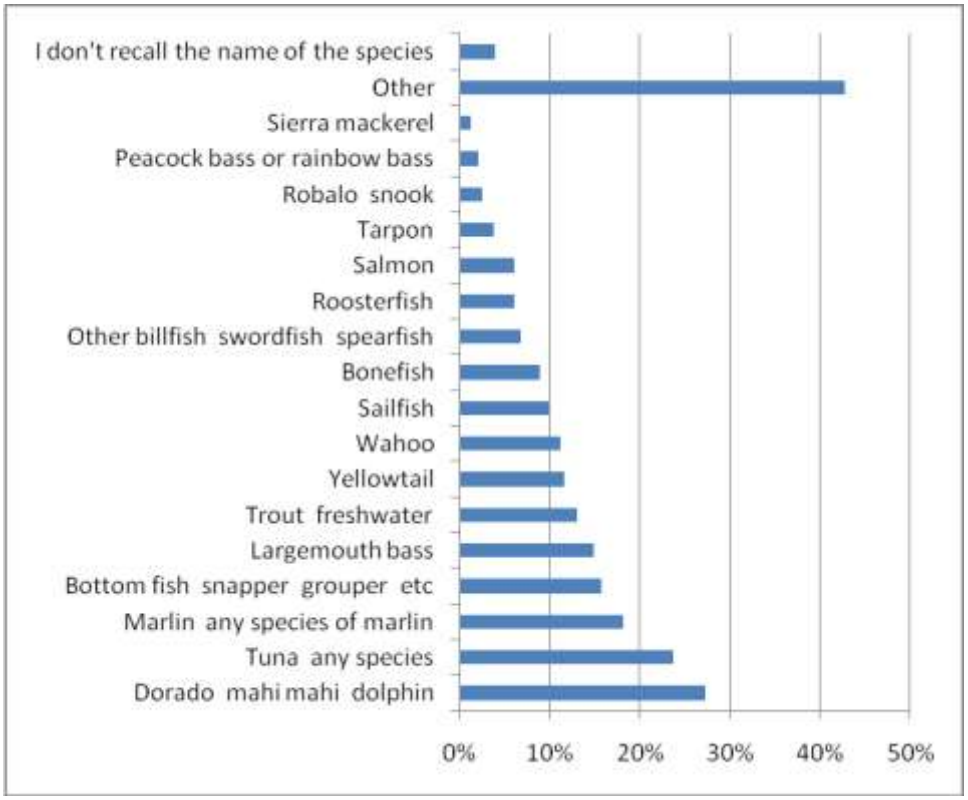
Country Visited:	N	Yes	No
Canada	213	28.20%	71.80%
Mexico, freshwater	24	29.20%	70.80%
South America, other	4	50.00%	50.00%
Mexico, saltwater	81	54.30%	45.70%
Other Central American countries	7	57.10%	42.90%
Costa Rica	17	58.80%	41.20%
Panama	5	60.00%	40.00%
Bahamas	19	63.20%	36.80%
Caribbean islands	27	77.80%	22.20%
Other, please tell us where:	40	80.00%	20.00%
Europe	12	83.30%	16.70%
Africa	3	100.00%	0.00%
Australia/New Zealand	3	100.00%	0.00%
Brazil	2	100.00%	0.00%
Pacific islands (except Hawaii)	1	100.00%	0.00%
Overall Average:	458	46.70%	53.30%

Source: Southwick Associates, Inc. (2009)

1.1.3 Tourist preferences and degree of satisfaction

Anglers were asked which species they targeted on their most recent trip. Recognizing there are hundreds of gamefish species around the world, attempts were made prior to the survey to identify the major game species that are present in most of the world's top fishing destinations. These species were then listed in the survey along with an "other" category to capture responses for species not listed. The results (Table 3) show that Mahi-mahi, also known as mahi-mahi or dolphin-fish, was the most commonly targeted species. Tuna was the second most popular species, followed by marlin. The results give an indication of the species that may best attract anglers to international locations. Given the small sample sizes per country, it was not possible to produce country-specific results.

Table 3. Preferred Species



Source: Southwick Associates, Inc. (2009)

Anglers were asked to report their satisfaction with their most recent international fishing trip, as follows: *"Regarding this most recent trip to another country, considering the time and expense required to travel and visit, please rate how satisfied you were with your overall experience."*[6]

The results show (**Error! Reference source not found.**) that anglers visiting Costa Rica are generally satisfied with their visits, though the results need to be interpreted carefully given only 15 Costa Rica anglers replied to this question. Considering Mexico is Costa Rica's primary competition for U.S. anglers, the satisfaction rates reported by U.S. anglers was practically the same for both countries. Statistically, given the small sample size for Costa Rica anglers, we cannot say Costa Rica rated as more favorable than Mexico. However, it is reasonable to say anglers indicate high levels of satisfaction with their experiences in both countries.

[6] Please note that sample sizes (N) are low for a number of countries listed in the table. As a general guideline, results for countries with 10 or less responses should not be considered reliable, and any response under 20 should be used with caution

Table 4. Regarding this most recent trip to another country, considering the time and expense required to travel and visit, please rate how satisfied you were with your overall experience. (1 = not satisfied at all, 5 = very satisfied)

Location	N	Mean
Brazil	2	5.000
Australia/New Zealand	3	4.599
Costa Rica	15	4.462
Africa	2	4.408
Mexico, saltwater	76	4.287
Europe	11	4.264
Other Central American countries	7	4.244
Panama	5	4.213
Canada	199	4.212
Mexico, freshwater	24	4.200
Pacific islands (except Hawaii)	1	4.000
Bahamas	17	3.615
South America, other	3	3.455
Other, please tell us where:	30	3.418
Caribbean islands	27	3.312

Source: Southwick Associates, Inc. (2009)

On the other hand, U.S. anglers who have traveled outside of the U.S. and fished were asked about which amenities and conditions were the most or least desirable.

In Table 5, the responses for all U.S. anglers, regardless of where they fished, are presented next to the results received specifically from U.S. anglers who visited Costa Rica. The results allow Costa Rica to compare its visitors to other countries. Not surprisingly, the perceived quality of the fishing is the most important factor when an angler chooses where to visit. “Relative peace and quiet” was the second most important factor, indicating that after fishing, anglers want to relax. Nightlife was the lowest rated factor, though this does not mean nightlife is unimportant to all anglers. The quality of fishing boats and crews is also important along with security and safety. Fishing destinations that best meet anglers’ expectations can expect to see continued or increased visits from U.S. anglers. These results can be used by tourism officials and private businesses to improve local conditions or better focus their marketing and advertising efforts.

Table 5. Regarding your most recent fishing trip in another country, please rate how important each one of the following reasons was in your selection of that country. (1 = not satisfied at all, 5 = very satisfied)

	Mean, for all Anglers	Mean for Anglers Who Visited Costa Rica
Quality of fishing, defined as "Did the opportunities to catch fish meet your expectations?"	4.01	4.16
Relative peace and quiet	3.82	4.06
Fishing services boat and crew quality	3.59	3.71
Feeling of security and safety	3.49	3.68
Price, overall lodging amenities, etc	3.48	3.60
Other outdoor activities	3.00	3.07
Resort lodge amenities such as bars	2.91	3.22
Nightlife	2.12	2.64

Source: Southwick Associates, Inc. (2009)

Conservation and fishery management issues can impact anglers' decisions. Table 6 indicates which fisheries management changes may have a greater or lesser impact on anglers' travel decisions. In general, the number of fish anglers are allowed to retain, known as "bag limits," are not a concern among anglers. It is speculated that most anglers release their fish. If true, changes to the number of fish anglers are allowed to keep will not affect their decisions about which countries to visit.

Commercial harvests of popular gamefish are a concern among anglers. Countries seen by U.S. anglers as having reduced commercial harvests will likely receive greater favor from international anglers compared to countries permitting increased harvests.

Table 6. Attractants or Deterrents to Increased Visits

	Less likely to visit	More likely to visit	The same/no change
Commercial harvest of gamefish recently began or increased since your last visit	58.5%	4.7%	36.8%
Commercial harvest of gamefish was recently restricted or stopped completely	9.4%	50.9%	39.7%
Bag limits for gamefish were tighter meaning even more would be released than currently	12.4%	30.7%	56.8%
Bag limits for gamefish were looser meaning you can keep more fish than before	24.8%	13.5%	61.7%

Source: Southwick Associates, Inc. (2009)

Please note that survey respondents did not know that Costa Rica was the focus of this marketing-oriented survey. Anglers were asked in which country they would prefer to fish if the opportunity to travel arose again. Five choices were provided. Table 7 presents the results. South Florida was the top choice, even over well-known international destinations such as Mexico, Costa Rica and the Bahamas. One-third of anglers would prefer fishing in Florida. Costa Rica and Mexico essentially tied, with each being preferred by less than one-fifth of surveyed U.S. anglers. For Costa Rican fisheries and tourism officials, it is important to note that U.S. anglers have choices and Costa Rica is not the top choice among a majority of U.S. anglers.

Table 7. Of the following locations, which one would you prefer to fish if you had a choice

	Percent
South Florida	33.8%
No preference/not sure	22.2%
Costa Rica (Pacific or Caribbean coast)	18.5%
Mexico (Pacific or Caribbean coast)	17.8%
Bahamas	7.7%

Source: Southwick Associates, Inc. (2009)

Error! Reference source not found. explores the reasons why anglers prefer one destination over others. Overall, the perception about the quality of fishing was the dominant reason, especially for anglers who chose Costa Rica. Any perception among U.S. anglers that the quality of Costa Rica's fishing has diminished is expected to negatively impact the annual number of visitors to Costa Rica. Among anglers who chose other locations, a high percentage stated "other" reasons for choosing that location. Anglers were asked to write in these other reasons, and most were personal in nature, such as having friends or family living there, or connections to low-cost accommodations at that location. The degree of difficulties associated with travel may have been an issue with a small number of survey respondents.

Table 8. Please tell us why you chose that location as your preferred destination

Reasons	Anglers Who Chose Costa Rica	Anglers Who Chose Other Locations
I understand the fishing is great	68.3%	35.8%
Other, please tell us why:	12.8%	21.6%
I have friends there or other reasons to travel there	7.3%	9.8%
I would feel more comfortable and more secure there	5.2%	9.8%
My preferred destination has stronger conservation laws and practices	2.5%	0.9%
Less hassle to get there and fish there	2.1%	11.2%
Cost of travel	1.7%	10.9%

Source: Southwick Associates, Inc. (2009)

1.2 Opinion of Costa Rican experts regarding sportfishing

A panel of Costa Rican sportfishing experts was contacted by the Economic Sciences Research Institute (IICE) of Universidad de Costa Rica to obtain their perspectives regarding the strengths and weaknesses of sportfishing in Costa Rica and their opinion on the role of the public and private sectors in promoting this activity.

Appendix 3 includes the responses of the group of 30 experts to each of the 11 questions related with: i) Costa Rica as a sportfishing destination, ii) aspects to be improved by the country to remain competitive as a sportfishing destination, and iii) main challenges faced by the country and role of the government and the private sector. The experts consulted were contacted by phone and email. The questions were as follows.

1. In your opinion, why is Costa Rica an important sportfishing destination in Central America?
2. What makes Costa Rica a different sportfishing destination from Central America and others around the world?
3. What are the main economic benefits of sportfishing for Costa Rica?
4. Which tourism activities benefit directly or indirectly from sportfishing in Costa Rica and how?
5. Taking into account the existence of multiple sportfishing destinations in Latin America and the world, what is needed to make this country more competitive? (refers to hotels, infrastructure, transportation, etc.)
6. Considering the marketing and promotion activities implemented by other countries to attract US anglers, what are the main challenges for Costa Rica to attract more anglers?
7. How would you rate government and public institution actions related to:
    a. Promoting sportfishing (in the last six months);
    b. In the last five years (excluding the last six months);
    c. Sportfishing regulations in the last six months, and in the last five years (excluding the last six months);
    d. Commercial fishing regulations in the last six months, and in the last five years (excluding the last six months);
    e. Progress of fisheries legislation (commercial and sportfishing) in the last six months, and in the last five years (excluding the last six months).
8. In your experience, what have been the main contributions of the private sector related to:
    a. Capital investments (hotels, marinas, boats, etc.);
    b. Policies: collaborating in the creation and approval of new legislation and in raising public awareness of the importance of this activity; and
    c. Any other contributions?
9. What is your opinion regarding sportfishing regulations in Costa Rica compared to other countries?
10. Please provide some ideas on how the sportfishing industry could expand existing commercial relations with other tourism sector and supply companies.
11. What are the main threats to the sportfishing industry in Costa Rica?

Overall, the responses to the individual interviews showed these experts consider Costa Rica a tourist destination not only for its policies protecting billfish, mahi-mahi and tuna but also because of the relative number of these species in Costa Rican waters. They believe the stocks of billfish and other species in the Central American area are among the largest in the world and the angler community is well represented by various fishing clubs.

The experts believe that despite the existence of other competing countries, Costa Rica is close to the United States and has good hotel and service infrastructure for sportfishing, in addition to the variety of other tourist products offered by the country. Among the economic benefits of this activity they mentioned the generation of foreign currency and employment. Some experts estimated sportfishing could be contributing up to US$700 million to the country's economy each year. Depending on the type of boat, some specialists believe half a day of fishing could earn between US$600 and US$1,500 for its owner. In addition, they stated each angler spends an average of 3 to 4 days fishing while visiting. There was even a statement one sailfish could bring anywhere from US$2,000 to US$3,000 in sportfishing that, in the opinion of the interviewee, should be compared to it being caught for sale, at an estimated price of US$12.50.

A common opinion among the experts refers to the need for reformulating the laws and the participation of the Fisheries Agency, INCOPESCA, in the control, regulation and monitoring of sustainable harvesting by commercial fisheries. The experts believe anglers are more likely to visit areas with good quantity and quality of species. Another point of agreement was the need for improving road infrastructure, sewage and coastal security. There is also a need for better marketing and promotion in international markets. The general opinion is that government institutions do not provide necessary support, for example, in disseminating and participating in sportfishing events and in enacting and enforcing laws to regulate unsustainable commercial harvests. They indicated the private sector is making significant investments in hotel infrastructure and building marinas.

Chapter 2

Estimated Angler Spending in Costa Rica

2.1 Estimated Number and Percentage of Sportfishing Tourists

Due to the lack of statistical information regarding the number of anglers in Costa Rica, their expenditures and economic contribution in terms of foreign currency generation for the country, estimates were developed for 2008 through a survey taken at the two main airports. Typical spending was then estimated (in US dollars) for an average visiting angler and his accompanying group for various services, activities and items related to sportfishing.

2.1.1 Target Audience, Questionnaire Design, Sample and Fieldwork

The target population included all visitors (non residents over 18 years old) to Costa Rica during the first three months of 2009 as they exited the country through Juan Santamaria and Liberia International Airports. The interviews were conducted at the boarding gates. Flight schedules were reviewed to ensure a significant and representative sample of passengers traveling to the United States and Canada. The final sample consisted of 169 tourists at Juan Santamaría and 68 at Liberia. The fieldwork began 16 February and ended 17 April 2009.

The questionnaire used is presented in Appendix 4 and consists of several sections. The first section asked about the number of times visitors – whether they fished or not - had visited the country and, regarding the last visit, the number of days stayed, whether alone or with family or others. Tourist were also asked about the number of days fished and in what regions, in addition, the type of fish captured from a previously selected list.

The next section inquired about expenditures, including air travel, charters and other expenses purchased outside the country. Another question recorded expenditures made within the country for fuel, charter boats, lodging, food and beverage, entertainment and other services and items.

Anglers who owned boats in Costa Rica were then asked about maintenance, accessories, furniture, repairs, taxes and marina expenses. The last part covered where they fish, and basic descriptive variables. All questions were close-ended to avoid any qualitative responses.

2.1.2 Estimated Number of Visiting Anglers

Recognizing the proportions in the sample had to agree with the number of tourists departing from each airport, the sample had to be weighted in order to analyze the results and create statistical charts. The weighting factor for Santamaría Airport was 1.21 and 0.46 for the Liberia Airport, based on historical entry and exit data supplied by the Costa Rica tourism agency, ICT.

The confidence level for the estimates was 95.0%; sampling error for Juan Santamaría Airport was established at 7.5% and 11.9% for Liberia. Sampling error for the entire sample was estimated at 6.38%[7].

Table shows the main activities carried out by the tourists surveyed. Nearly 20.5% of the 301 tourists interviewed visited the country to fish. For Juan Santamaría Airport, this meant 22.5% of U.S. tourists and 10.7% of Canadians; for the Liberia Airport, the percentages reported were 85.9% and 16.1%, respectively.

[7] Statistical processing was done using SPSS for Windows version 15, cross-processing all variables of interest. Percentages by column were obtained for each variable in the study with its respective cross-variables to obtain the various profiles. To calculate incidence, question 2 of the questionnaire was used, differentiated by airport and nationality.

Table 8. Main Activities by Tourists Interviewed in Early 2009

Activities and Areas Visited	Airport												TOTAL	
	JUAN SANTAMARÍA INTERNATIONAL AIRPORT						LIBERIA AIRPORT							
	WHERE ARE YOU FROM?						WHERE ARE YOU FROM?							
	USA		CANADA		Total		USA		CANADA		Total			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
NATURE TOURS/WILDLIFE VIEWING	544	73.8%	124	83.2%	710	76.0%	29	45.3%	44	39.3%	278	51.8%	988	67.2%
HIKING	409	55.5%	109	73.2%	552	59.1%	41	64.1%	63	56.3%	378	70.4%	930	63.2%
HORSEBACK RIDING	255	34.6%	60	40.3%	342	36.6%	24	37.5%	5	4.5%	158	29.4%	500	34.0%
SPORTFISHING	166	22.5%	16	10.7%	188	20.1%	55	85.9%	18	16.1%	123	22.9%	311	21.1%
SAILING	100	13.6%	20	13.4%	129	13.8%	11	17.2%	3	2.7%	83	15.5%	212	14.4%
RELAXED ON A BEACH	88	11.9%	23	15.4%	116	12.4%	5	7.8%	3	2.7%	52	9.7%	168	11.4%
GOLF	34	4.6%	3	2.0%	39	4.2%	2	3.1%	4	3.6%	11	2.0%	50	3.4%
FIESTA	6	0.8%	0	0.0%	7	0.7%	6	9.4%	13	11.6%	26	4.8%	33	2.2%
CANOPY	10	1.4%	2	1.3%	14	1.5%	0	0.0%	4	3.6%	6	1.1%	20	1.4%
TO GET AWAY	9	1.2%	2	1.3%	11	1.2%	0	0.0%	1	0.9%	6	1.1%	17	1.2%
DIVING	1	0.1%	3	2.0%	4	0.4%	1	1.6%	2	1.8%	8	1.5%	12	0.8%
VOLCANOES	3	0.4%	0	0.0%	3	0.3%	0	0.0%	4	3.6%	4	0.7%	7	0.5%
RAFTING	1	0.1%	1	0.7%	2	0.2%	0	0.0%	1	0.9%	1	0.2%	3	0.2%
SURFING	0	0.0%	1	0.7%	1	0.1%	0	0.0%	2	1.8%	2	0.4%	3	0.2%
VISIT FRIENDS	0	0.0%	0	0.0%	0	0.0%	3	4.7%	0	0.0%	3	0.6%	3	0.2%
BUSINESS	0	0.0%	0	0.0%	1	0.1%	0	0.0%	0	0.0%	1	0.2%	2	0.1%
ANNULLED	0	0.0%	0	0.0%	2	0.2%	0	0.0%	0	0.0%	0	0.0%	2	0.1%
WEDDING	1	0.1%	0	0.0%	1	0.1%	0	0.0%	1	0.9%	1	0.2%	2	0.1%
MEETING	1	0.1%	0	0.0%	1	0.1%	0	0.0%	0	0.0%	0	0.0%	1	0.1%
COMPANY TRIP	0	0.0%	1	0.7%	1	0.1%	0	0.0%	0	0.0%	0	0.0%	1	0.1%
SNORKELING	1	0.1%	0	0.0%	1	0.1%	0	0.0%	0	0.0%	0	0.0%	1	0.1%
TOUR THE CARIBBEAN	0	0.0%	1	0.7%	1	0.1%	0	0.0%	1	0.9%	1	0.2%	2	0.1%
TRY LOCAL RESTAURANTS	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2	0.4%	2	0.1%
SHOP	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	0.2%	1	0.1%
TO REST	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	0.9%	1	0.2%	1	0.1%
REST	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	0.2%	1	0.1%
KAYAKING	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	0.2%	1	0.1%
NATIONAL PARK	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	0.2%	1	0.1%
VISIT MUSEUMS	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	0.2%	1	0.1%
MOTO CROSS	0	0.0%	0	0.0%	0	0.0%	1	1.6%	0	0.0%	1	0.2%	1	0.1%
Total	737	100%	149	100%	934	100%	64	100%	112	100%	537	100%	1471	100%
N. Pacific Coast	316	43.8%	56	39.7%	399	44.0%	30	46.9%	44	88.0%	136	34.1%	535	41.0%
Mid-Pac coast	483	66.9%	100	70.9%	609	67.2%	25	39.1%	5	10.0%	262	65.7%	871	66.7%
S. Pacific coast	97	13.4%	14	9.9%	115	12.7%	6	9.4%	2	4.0%	59	14.8%	174	13.3%
Caribbean coast	26	3.6%	3	2.1%	32	3.5%	6	9.4%	8	16.0%	21	5.3%	53	4.1%
Total	722	100%	141	100%	906	100%	64	100%	50	100%	399	100%	1305	100%

Source: 2009 airport intercept survey.

2.2 Estimated Angler Expenditures

2.2.1 Estimation Procedure

Since the responses to questions 12, 13 and 14 of the survey (Appendix 4) refer to tourist expenditures, regardless of whether the money was spent by the travel group or for the angler alone, considerations were made. Variables were identified for the total number of people in the angler's travel group, total travel group members who fished and the number of fishing days. In this set of questions the answers were divided into two groups: those related to expenditures by the travel group –including the angler- and those associated only to the angler, which was needed for instances when fishing was not the primary reason or motivation for the angler's visit to Costa Rica. In such cases, expenditures for travel and other activities not related to fishing were excluded.

For the first group, the following formula was used to obtain average expenditure per day per person:

$$G_{ij} = (X_{ij}/p_{ij})/d_{ij}$$

Where:
G_{ij} = average expenditure per person and per day
X_{ij} = general expenditure
p_{ij} = number of visiting tourists
d_{ij} = total number of days tourists stayed in the country

The above formula was applied to the following variables:

12.1 Package trips or tours
12.2 Airfare (commercial airlines, not including air taxis to your fishing site)
12.4 Other travel-related purchases made prior to departing home
12.5 Other expenses
13.2 Taxis, transfer vans, etc., to ports, restaurants, hotels
13.4 Car rental (not including any fuel purchased)
13.7 Hotels/motels/resorts
13.8 Timeshare (associated with the trip)
13.9 Campgrounds
13.10 Other
13.11 Restaurants, bars, carry-out food
13.12 Groceries, food, liquor bought in stores (not in restaurants or bars)
13.13 Ice
13.15 Gifts & souvenirs of any type
13.16 Entertainment and amusement/admission fees
13.18 Taxidermy (only taxidermy fees paid to Costa Rica)
13.19 Personal items (toiletries, medicine, etc.)
13.21 Other (except fishing gear)

The following formula was applied to the second group to obtain average expenditure per day and per person actually fishing:

$$G_{ij} = (X_{ij}/g_{ij})/f_{ij}$$

Where:
G_{ij} = average expenditure per person and per day
X_{ij} = expenses directly related to fishing
g_{ij} = number of anglers
f_{ij} = total number of fishing days

The variables are as follows:

12.3 Charterboats paid for in the US or outside of Costa Rica
13.1 Gasoline, fuel and oil for your vehicle
13.3 Charterboat fees, fishing guides
13.5 Boat rentals
13.6 Lodging
13.14 Bait (natural bait only such as mackerel and other, do not include lures)
13.17 Fish processing
13.20 Fishing gear and tackle such as lures, gloves, sinkers, hooks

14.1 Fuel
14.2 Repairs & maintenance
14.3 Captain & crew
14.4 Accessories, furnishings
14.5 Insurances, taxes
14.6 Marina expenses

Once these formulas were applied to the variables, the average expenditure per person per day was obtained and used under the assumption this corresponds to a typical angler. The next step was to calculate the total expenditure per angler based on the number of effective fishing days, using:

$$S_{ij} = G_{ij} * f_{ij}$$

Where:

S_{ij} = average expenditure per typical angler per effective number of fishing days
G_{ij} = average expenditure per person and per day
f_{ij} = total number of effective fishing days for anglers in the country

The next calculation estimates the percentage of all 2008 U.S. and Canadian tourists who fished in Costa Rica:

$$V_{ij} = N_{ij}/n_{ij}$$

Where:

V_{ij} = U.S. and Canadian tourists who fished in Costa Rica
N_{ij} = approximate population of US and Canadian tourists visiting Costa Rica to fish in 2008, according to ICT
n_{ij} = total number of people sampled in the surveys taken at the airports.

2.2.2 Estimated Total Expenditure

The following formula is applied to estimate total expenditure: Hij = S_{ij}*V_{ij} where variable Hij = approximate total expenditure of the typical tourist.

The next step is to obtain total expenditures by anglers for each variable (Ri_j) using the following formula:

$$R_{ij} = \sum_{i=1}^{226} Hij$$

Total expenditure for each question is the addition of all R_{ij} in question X.

$$Wj = \sum_{j=1}^{k} Rij$$

Where: Wj = total expenditure in question X. Finally, total expenditures are derived by summing the expenditures for each question.

$$Z = \sum_{j=1}^{3} Wj$$

Table 1 shows that in 2008, sportfishing tourism generated US$467 million in foreign currency, of which US$138 million were current expenses and investment in the fleet, including fuels, repairs and maintenance, captains and crew, insurance, taxes, accessories and furniture.

In addition, it can be inferred that US$329 million were spent for travel-related items such as lodging (US$119 million), restaurants (US$15.6 million), flights and fishing guides (US$88 million) and land transportation (US$6 million), among others. Finally, an estimated US$105 million were spent in flights and other services paid outside of Costa Rica prior to arriving.

Anglers with boats permanently or temporarily in the country spent approximately US$138.8 million in 2008 for items such as fuel (US$45.6 million), maintenance and repairs (US$25 million), furniture and accessories for their vessels (US$48 million), staff and crews (US$2.8 million), marina fees (US$16.6 million) and taxes and insurance (US$1.8 million).

Table 1. Estimated Angler Expenditure in Costa Rica (in 2008)

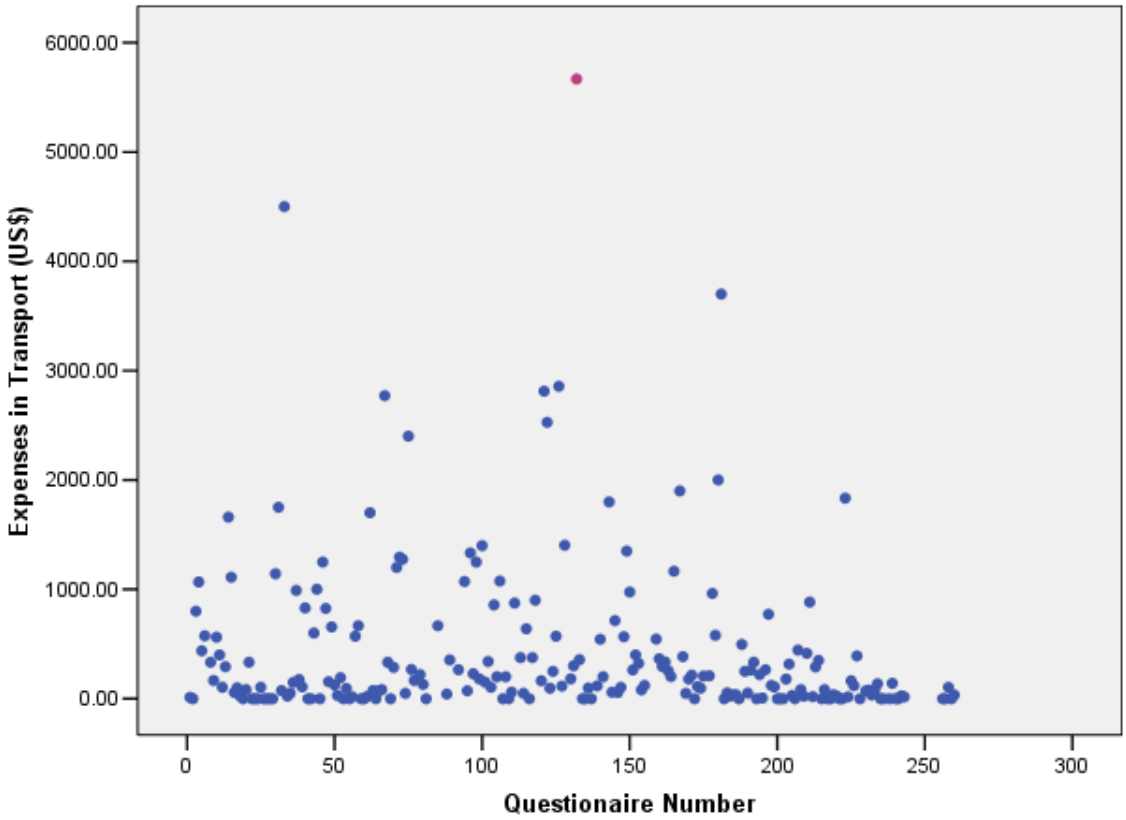
Descriptive Statistics	N	Min	Max	Amount	Avg	Stand. Dev.
12.1 Package trips or tours	283,783	0.0	2,812.5	21,217,693.6	74.8	272.8
12.2 Airfare (commercial airlines, not including air taxis to your fishing site)	283,783	3.6	2,732.6	37,484,126.3	132.1	228.0
12.3 Charterboats paid for in the US or outside of Costa Rica	283,783	0.0	5,000.0	34,619,417.5	122.0	399.8
12.4 Other travel-related purchases made prior to departing home	283,783	0.0	933.3	6,915,232.0	24.4	87.1
p12.5 Gasto_durante_dias_pesca	283,783	0.0	4,500.0	31,554,825.2	111.2	438.2
Total Question 12	283,783	0.0	5,666.7	105,071,528.2	370.3	667.9
13.1 Gasoline, fuel and oil for your vehicle	283,783	0.0	300.0	8,339,681.3	29.4	60.5
13.2 Taxi´s, shuttle vans, etc to get to hotels, marinas, restaurants, etc.	283,783	0.0	400.0	6,719,040.3	23.7	54.6
13.3 Charterboat fees, fishing guides	283,783	0.0	5,000.0	88,448,526.9	311.7	689.6
13.4 Car rental (not including any fuel purchased)	283,783	0.0	1,088.0	9,289,626.5	32.7	121.1
13.5 Boat rentals	283,783	0.0	1,000.0	11,350,642.8	40.0	131.6
13.6 Lodging: please report the type of lodging used and the cost	283,783	0.0	5,500.0	119,040,030.1	419.5	1,031.3
13.7 Hotels / Motels / Resorts:	283,783	0.0	4,500.0	37,512,733.0	132.2	456.9
13.8 Timeshare (please only report the cost associated with your trip and not any part of the purchase price)	283,783	0.0	560.0	929,133.5	3.3	34.8
13.9 Campgrounds	283,783	0.0	200.0	529,655.4	1.9	18.4
13.10 Other (please specify)	283,783	0.0	234.4	531,906.0	1.9	16.0
13.11 Restaurants, bars, carry-out food	283,783	0.0	500.0	15,625,270.4	55.1	85.7
13.12 Groceries, food, liquor bought in stores (not in restaurants or bars)	283,783	0.0	1,200.0	8,144,180.2	28.7	92.8
13.13 Ice	283,783	0.0	85.7	507,515.4	1.8	9.2
13.14 Bait (natural bait only, such as mackerel and bait bought at the launch of chartered trips. Please do not include lures)	283,783	0.0	200.0	530,016.2	1.9	16.8
13.15 gifts & souveniers of any type	283,783	0.0	214.3	5,118,115.0	18.0	34.5
13.16 Entertaiment and amusement / admission fees	283,783	0.0	3,000.0	5,752,060.2	20.3	174.7
13.17 Fish processing & shipping	283,783	0.0	1,000.0	2,925,468.6	10.3	92.2
13.18 Taxidermy (only taxidermy fees paid to Costa Rica business, not U.S. tacidermists)	283,783	0.0	50.0	65,935.5	0.2	2.9
13.19 Personal items (toiletries, medice, etc.)	283,783	0.0	300.0	802,736.3	2.8	18.9
13.20 Rods, ressls, fishing tackle & misc related items (line, leaders, lures, hooks, sinkers, coolers, gloves, etc.)	283,783	0.0	1,500.0	6,417,581.6	22.6	159.2
13.21 Other (exept fishing and boating equipment whic is the next question):	283,783	0.0	200.0	497,673.3	1.8	18.3
Total Question 13	283,783	0.0	10,100.0	329,077,528.4	1,159.6	1,551.0
14.1 Fuel	3,708	210.0	40,000.0	45,615,160.3	12,302.5	16,123.9
14.2 Repairing & maintenance	3,708	150.0	25,000.0	25,352,055.2	6,837.5	10,514.0
14.3 Captain & crew	3,708	0.0	3,000.0	2,873,541.9	775.0	1,285.4
14.4 Accessories, furnishings	3,708	0.0	50,000.0	46,486,492.4	12,537.5	21,632.0
14.5 Insurances, taxes	3,708	0.0	2,000.0	1,853,898.0	500.0	866.1
14.6 Marina expenses (slip fees & maintenance only. Parts and items purchased are covered in the next & final expenditure question)	3,708	0.0	15,000.0	16,685,082.0	4,500.0	6,185.5
Total Question 14	3,708	510.0	130,100.0	138,866,229.7	37,452.5	53,626.6
Fuente: Encuesta Pesca Deportiva en Costa Rica, Febrero - Abril 2009				599,735,052.6		

Source: In-house based on angler surveys at airports

2.2.3 Atypical Anglers

Questions on total expenditures (questions 12-14 in Appendix 4) identified atypical anglers, i.e., tourists with extreme expenditures compared to the rest of the anglers interviewed. The following distribution graph (Figure 2) shows total transportation expenses (survey question #12) for anglers surveyed. Figure 2 shows an extreme value (in red) for that tourist, for a total of US$5,667 during his stay. Dollars are shown on the Y, or vertical, axis, while the X or horizontal axis reports the identity of the interviewed single tourist (identified by a number in the interview carried on at the field work).

Figure 2. Distribution of Total Transportation Expenses (question 12)



Source: In-house based on angler survey.

Figure 3 shows the characteristics of this atypical or “extreme” tourist for total transportation expenses (question 12), total “overall expenses” (question 13) and total boat maintenance expenses (question 14). This atypical angler traveled to Costa Rica twice and fished 3 days, with an estimated expenditure of US$7,267 in a 9 day stay. In spite of the differences shown by his atypical tourist the corresponding data was used in the analysis since its inclusion did not affect the results significantly.

Figure 2. Characteristics of the "Extreme" Tourist Based on Survey Responses

Source: In-house based on angler survey

Would you visit Costa Rica if you could not fish?	Yes
Before this one, how many times have you visited Costa Rica and in how many have you fished?	2
Who traveled with you?	Traveled alone
How many days did you stay in Costa Rica this trip?	9
In the latest trip, how many days did you fish?	3
Days fished on a boat	3
SPECIES YOU EXPECTED TO CATCH (TARGET SPECIES)	Sailfish, marlin, mahi-mahi, tuna, snapper, grouper
SPECIES YOU EXPECTED TO CATCH (SPECIES CAPTURED)	MAHI-MAHI, marlin, tuna, snapper, grouper
Regions fished	SOUTH PACIFIC
Country	United States
Total income before taxes last year	$20,000- $40,000
Transportation expenses for days fished	5,667
Overall expenses for days fished	7,267
Maintenance and other expenses for days fished	
Do you own or keep a boat in Costa Rica?	NO
In your most recent trip, how many days did you fish?	3
SEX	Male

2.3 Correlation Between Variables and Angler Household Income

In order to compare average income for anglers targeting specific species, correlations were made between angler household income and other survey variables. The independent variable (income) is measured on a nominal scale (by categories) and the dependent variable (species) is measured on an interval or ratio scale. A low correlation is shown by a coefficient lower than 0.4, while a moderate correlation has coefficient values between 0.4 and 0.6. A correlation coefficient with values between 0.6 and 0.8 is considered high and values over 0.8 are considered very high.

In general, the correlation between angler income and type of species captured was low. For example, the correlation coefficient between angler income and the capture of marlin was 0.22 and for wahoo the correlation was 0.28. An even lower degree of association was found between angler income and keeping a boat in Costa Rica, with a coefficient of 0.1. On the other hand, a high correlation was shown between angler income and expenditure in taxis, transfer vans, etc., to reach ports, restaurants and hotels. This coefficient was 0.71, while expenses for groceries, food, liquor bought in stores and not in restaurants and bars had a coefficient of 0.7. A moderate correlation was also shown between income and entertainment expenses, with a coefficient of 0.66. For all other variables related to expenses (question 13) the correlation with angler income was low. It should be noted that traveling to Costa Rica may be correlated to income, with lower income travelers possibly less willing to visit due to cost.

2.4 Types of Fish Captured

Table 3. **Angler response regarding catch by species** shows the catch frequency for each type of fish in 2008. The most frequently captured fish were sailfish, marlin and mahi-mahi, while was snook was the least frequent. It is estimated that 139,122 anglers caught sailfish. Marlin were captured by 117,588 anglers. Mahi were caught by 106,822 anglers.

Table **4** shows most expected to catch marlin (158,705), sailfish (145,628) and mahi-mahi (117,124). It appears most were successful in their fishing expectations

Table 3. Angler response regarding catch by species

Type of fish	Response		Total
	Inference from positive responses	Inference from number of responses	
Snook	12,769	271,014	283,783
Tarpon	22,380	261,403	283,783
Sierra mackerel	23,371	260,412	283,783
Yellowtail	27,563	256,220	283,783
Wahoo	37,998	245,785	283,783
Pelagic fish	42,186	241,597	283,783
Tuna	47,960	235,823	283,783
Roosterfish	53,562	230,221	283,783
Mahi-mahi	106,822	176,961	283,783
Marlin	117,588	166,195	283,783
Sailfish	139,122	144,661	283,783
Other	31,888	251,895	283,783

Note: This is a multiple choice question, also presents percentage of response per category

Source: In-house based on angler survey.

Table 4 Angler expectations regarding fish capture

Type of fish	Response		Total
	Inference from positive responses	Inference from number of responses	
Snook	18.778	265.005	283,783
Tarpon	28.937	254.846	283,783
Yellowtail	33.217	250.566	283,783
Sierra mackerel	33.258	250.525	283,783
Pelagics	39.658	244.125	283,783
Wahoo	52.308	231.475	283,783
Roosterfish	69.897	213.886	283,783
Tuna	72.120	211.663	283,783
Mahi-mahi	117.124	166.659	283,783
Sailfish	145.628	138.155	283,783
Marlin	158.705	125.078	283,783
Other	17.667	266.116	283,783

Note: This is a multiple choice question, also presents percentage of response per category

Source: Southwick Associates. AnglerSurvey results, 2009

[1]

Chapter 3

Estimated Income and Investment by Businesses and Hotels Catering to Anglers

A survey was conducted in August and September 2009 to identify the relationship between sales income and investment by sportfishing businesses, tourist services and hotels. Appendices 5 and 6 present the survey questionnaires. This effort analyzes the impact of the foreign currency generated by sportfishing on Costa Rica's short term private consumption and gross capital formation.

3.1 Sample Framework of Target Population and Fieldwork

To be consistent with the rest of this study, the survey was divided into four regions: Caribbean, North Pacific, Central Pacific and South Pacific. An initial list of businesses was prepared using the Tourism Directory, including companies affiliated with Cámara Nacional de Turismo (CANATUR), the Internet, and businesses identified by The Billfish Foundation and Mr. Rob Southwick of Southwick Associates, Inc. A total of 438 businesses were identified and contract information were recorded (company name, address, telephone, name of manager, fax number, e-mail, web address, type of business, and number of employees.)

A telephone survey was then taken to learn whether these businesses provided any services related to sportfishing. It was determined that out of the 438 businesses on the list, 239 catered to anglers. The 239 facilities were divided into two groups: 117 hotels and 122 others, including sportfishing, tour operator, transportation, restaurants, fishing tackle retail, and various other activities. Sample size was determined for the estimated population using a simple random sampling formula for all facilities with less than 100 employees. Personal interviews were conducted for any business with over 100 employees in the specific area. The parameters to estimate the sample (theoretical) were:

$n = (Z_{\alpha/2} * \sigma_x/d)^2 / (1 + 1/N * (Z_{\alpha/2} * \sigma_x/d)^2)$, where
n : Sample size (theoretical)
Z : Abscissa of the normal curve for 90% confidence = 1,645
d : Maximum permissible error as percentage of employment average = 0.15

The size of the practical sample (i.e., the value of the theoretical value used) is presented in Table 5. The establishments were selected at random.

Table 5 Sample used in the Business Survey

FACILITY	SAMPLE	SURVEY[8]	TOTAL
BUSINESS	77	2	79
HOTEL	46	10	56
TOTAL	132	12	144

Source: In-house.

[8] The survey refers to the case where the number resulting from the mathematical formula coincides with the number of observations of the population with the characteristic of interest.

The questionnaire used to collect information from businesses and hotels is presented in Appendices 5 and 6. Personal visits were made to all hotels and businesses selected in the sample.

3.2. Estimated Business Income and Expenses

3.2.1 Estimation Procedure

To expand the results to the population level, an expansion factor was used for these results, calculated as follows: $N/n_t * n_t/n_p$, where: N is the total number of facilities, n_t is the theoretical sample, n_p: practical sample.

To obtain income and expense values for these businesses, a methodology similar to that used in the tourist survey was used. Since the responses obtained for these variables (items in survey questions) correspond to total expenditures for the business or hotel (hereinafter the "facility"), and the topics of interest are investment and operating expenses, the survey were used in these analysis and classified appropriately. After this classification[9], the following formula was applied to investment and operating expenses:

$$G_{ij} = (X_{ij}/100)*d_{ij}$$

where:

G_{ij} = Expense in dollars by facilities to cater to anglers
X_{ij} = Variable for total expense on tourists in general
d_{ij} = Percentage of anglers

For restaurant facilities, it was possible to determine food and beverage purchased in the area where the facility is located (question 19 of the business survey). To obtain this result, the percentage of total expenditures mentioned by the interviewee as spent in food and beverage was used. The following formula was applied:

$$G_{ij} = (X_{ij} * P_{ij})/100$$

where:

G_{ij} = Expense in dollars in food and beverage purchased in the area to cater to anglers
X_{ij} = Variable for total expenses on tourists.
P_{ij} = Percentage of food and beverage expenses in the area.

Next, to calculate total expenses, the following formula is applied:

$$H_{ij} = G_{ij}*V_{ij}$$

where:

H_{ij} = Expansion of expenses to total population of facilities catering to anglers

[9] The investment and operating expenses were: Payroll and staff; Investment in new buildings, new vehicles, new furniture and equipment, new boats and fishing equipment, other new investment; Expenses in facility maintenance, furniture and equipment, vehicle maintenance, boats and fishing equipment, other maintenance expenses, food and beverage operating expenses, inputs and supplies and service expenses.

G_{ij} = Expense in dollars of facilities to cater to anglers
V_{ij} = Expansion factor

The following step is to obtain total expenses of the facilities for each variable (H_{ij}), by applying the following formula.

$$R_{ij} = \sum_{i=1}^{n} Hij$$

3.2.2 Estimation of expenses in new investment on national and imported goods

All investment and operating expenses in national and foreign goods were applied the percentage indicated by the responders for those items, out of the total investment and expenses.

Table 6 indicates 116 facilities[10] spent and invested approximately US$20 million in a typical annual period, of which US$2.5 million were for personnel expenses, US$9.1 million for vehicle maintenance and US$3 million for supplies, among others. In addition, this group of facilities distributed US$4.4 million in expenses and investment to nationals and US$11.7 million to foreign firms. It should be noted that the majority of these facilities are small in terms of number of employees.

In addition, these expenses and investments were projected to the total of 247 hotels included in ICT's web page in the geographic areas of interest. An approximation factor was calculated using these data (expansion of simple size) that was used to generate descriptive statistics of the expense, investment and income variables. This estimation is presented in **Error! Reference source not found.**.

Thus, it was estimated that this large number of hotels catering to anglers spent approximately US$23.7 million in expenses and investment in 2008. Approximately US$5 million of the income were spent in payroll, while US$4.3 million went to maintenance of facilities and US$2.1 million to furniture and equipment maintenance.

It was estimated these hotels received approximately US$30 million in income, and over 50% (US$16 million) were obtained from food and beverage.

[10] Total sample of facilities surveyed in the geographic areas of interest.

Table 6 Expenses by businesses catering to anglers in Costa Rica in 2008 (in US dollars)

Descriptive Statistics	N	Minimum	Maximum	Amount	Mean	Standard Deviation
INVESTMENT AND OPERATIONS						
Personnel and employees	118	0	364,853	2,527,168	21,417	60,930
Investment in new buildings	116	0	28,830	154,261	1,336	5,120
Investment in new vehicles	116	0	28,830	174,568	1,511	4,656
Investment in furniture and equipment	116	0	250,000	690,777	5,981	36,486
Investment in new boats and fishing equipment	116	0	210,000	616,962	5,342	30,713
Other new investments	116	0	6,081	29,202	253	964
Facility maintenance expenses	116	0	135,000	494,698	4,283	17,310
Furniture and equipment maintenance expenses	116	0	67,500	149,220	1,292	7,689
Boats and fishing equipment maintenance expenses	116	0	3,600,000	9,171,061	79,403	525,975
Vehicle maintenance expenses	116	0	360,000	1,382,937	11,973	54,924
Other maintenance expenses	116	0	22,500	57,215	495	2,643
Food and beverage operating expenses	113	0	44,375	381,848	3,379	7,828
Materials and supplies operating expenses	113	0	775,312	3,020,212	26,728	105,494
Services expenses	116	0	180,000	560,758	4,855	20,895
Municipal and other permits	113	0	13,500	52,453	464	1,691
Income tax payments	113	0	112,500	220,719	1,953	12,971
Financial expenses	116	0	11,400	59,226	513	1,882
Total expenses and investments	116	38	4,081,530	19,743,285	170,938	622,846
INVESTMENT AND EXPENSES ON NATIONAL GOODS						
New investments	116	0	54,930	358,181	3,101	9,476
Maintenance expenses	116	0	382,500	1,205,181	10,434	45,799
Food and beverage operating expenses	113	0	44,375	372,849	3,300	7,840
Materials and supplies operating expenses	113	0	697,780	2,465,990	21,823	92,141
Total new investments or expenses in national goods	116	2	756,689	4,402,201	38,114	112,136
INVESTMENT AND EXPENSES ON IMPORTED GOODS						
New investments	116	0	258,000	1,124,125	9,733	44,199
Maintenance expenses	116	0	3,960,000	10,049,951	87,013	578,640
Food and beverage operating expenses	113	0	3,592	8,999	80	531
Materials and supplies operating expenses	113	0	141,000	554,222	4,905	22,689
Total new investments or expenses in imported goods	116	0	3,965,000	11,737,297	101,622	581,457
Expense for food purchased in the area (only for restaurants)	68	0	20,585	63,800	938	3,908
Income from anglers	116	50	28,831,000	110,107,023	953,308	4,300,038

Source: IICE-UCR, Business Survey, August-September 2009

In addition, it was estimated these hotels spent US$12.1 million in supplies and investment paid to national companies, and maintenance contributed the largest portion, namely US$6.8 million.

Table 15. Expenses by hotels catering to anglers in Costa Rica in 2008 (Based on approximation using ICT data)

Descriptive Statistics	N	Minimum	Maximum	Amount	Mean	Standard Deviation
INVESTMENT AND OPERATIONS						
Personnel and employees	238	95	456,066	4,954,351	20,800	70,769
Investment in new buildings	238	0	250,000	1,689,876	7,095	38,866
Investment in new vehicles	238	0	120,000	709,101	2,977	18,545
Investment in new furniture en equipment	238	0	2,850	53,996	227	573
Investment in new boats and fishing equipment	238	0	1,596	9,273	39	247
Other new investments	238	0	5,000	49,055	206	887
Facility maintenance expenses	238	0	684,099	4,354,005	18,280	105,533
Furniture and equipment maintenance expenses	238	0	308,758	2,184,253	9,170	47,730
Boats and fishing equipment maintenance expenses	238	0	7,500	79,673	334	1,188
Vehicle maintenance expenses	238	0	9,649	56,054	235	1,492
Other maintenance expenses	238	0	12,500	177,624	746	2,143
Food and beverage operating expenses	238	0	342,049	3,138,728	13,177	53,310
Materials and supplies operating expenses	238	0	228,033	1,701,279	7,143	35,187
Services expenses	238	0	228,033	2,263,592	9,503	35,048
Municipal and other permits	232	0	11,402	149,312	643	1,961
Income tax payments	232	0	25,000	436,271	1,877	5,020
Financial expenses	238	0	276,000	1,722,337	7,231	42,619
Total expenses and investments	***238***	***183***	***2,240,883***	***23,728,779***	***99,621***	***349,085***
TOTAL HOTEL INCOME						
Rooms	232	3	250,000	5,749,521	24,742	56,668
Food and beverage	232	0	2,444,600	16,334,159	70,290	381,548
Other activities	232	0	1,426,016	8,911,363	38,348	222,767
Total income	232	7	4,074,333	30,995,043	133,380	635,667
Expense in food and beverage purchased in the area	238	0	34,205	598,473	2,513	6,711
INVESTMENT AND EXPENSES ON NATIONAL GOODS						
New investments	238	0	120,000	819,799	3,442	18,504
Maintenance expenses	238	0	684,099	6,849,749	28,757	114,371
Food and beverage operating expenses	238	0	342,049	3,138,728	13,177	53,310
Materials and supplies operating expenses	238	0	228,033	1,700,365	7,139	35,188
Total new investments or expenses in national goods	238	80	1,254,181	12,175,048	51,115	197,547
INVESTMENT AND EXPENSES ON IMPORTED GOODS						
New investments	238	0	270	1,627	7	42
Maintenance expenses	238	0	320	1,859	8	49
Food and beverage operating expenses	238	0	0	0	0	0
Materials and supplies operating expenses	238	0	86	914	4	15
Total new investments or expenses in imported goods	238	0	320	4,382	18	65

Source: IICE-UCR, Business Survey, August-September 2009

3.3. Correlation coefficient between facility income and other variables under study

Correlation coefficients were calculated to obtain evidence of the degree of association between income and expenses, investment and other variables by the businesses surveyed (**Error! Reference source not found.**). There is a high correlation between hotel income from anglers and single and double room rates in the high season.

This pattern is present both for percentage of anglers in the high season (0.82) as well as in the low season (0.88) and for the percentage referred by a foreign company. In addition, there are negative correlations with several variables, but not very significant in absolute values. A moderate correlation exists between hotel income and anglers referred by a foreign company.

Table 16. Correlation coefficient between hotel income from anglers and other characteristics

Variable	Correlation coefficient
Number of hotel stars	0.23
Total number of hotel rooms	0.12
Single and double high season rates	0.69
Other room high season rates	-0.04
Single and double low season rates	0.81
Other room low season rates	-0.04
Average occupancy in high season	0.09
Average occupancy in low season	-0.06
Percentage of anglers in high season	0.82
Percentage of anglers in low season	0.88
Average number of days anglers stay in high season	-0.12
Average number of days anglers stay in low season	0.02
Number of days fished per week in high season	-0.03
Number of days fished per week in low season	-0.03
Average number of persons fishing with angler in high season	-0.03
Average number of persons fishing with angler in low season	-0.03
Percentage of anglers with own boat or yacht	-0.03
Percentage of anglers chartering or renting boat	0.00
Percentage of anglers on sportfishing tours	-0.05
Percentage of US anglers	0.16
Percentage of Canadian anglers	-0.08
Percentage of European anglers	-0.10
Percentage of anglers from other countries excluding Costa Rica	-0.09
Percentage of Costa Rican anglers	-0.07
Number of employees in high season	0.38
Number of employees in low season	0.12
Percentage direct contact	-0.16
Percentage in all-inclusive package	-0.04
Percentage referred by a foreign company	0.73
Percentage referred by a national company outside the region	-0.03
Percentage referred by a national company within the region	-0.03
Percentage from other partner companies	-0.10
Number of suppliers within the area	-0.15
Number of tourist required to hire one more permanent employee	0.09

Number of tourist required to hire one more temporary employee	0.10
Is hotel independent or part of national or international chain or other?	0.06
How easy is it for your to purchase your main supplies	0.25
Is your margin higher or same than for similar companies?	0.30
Is your margin higher or same than for companies larger than yours?	0.24
Is your margin higher or same than for companies smaller than yours?	0.20

Source: IICE-UCR. Hotel survey August - September 2009

Error! Reference source not found. presents other correlation coefficients between hotel income and variables such as numbers of anglers visiting from United States and Canada and other places. The highest correlations were observed for anglers with own boat or yacht, percentage of anglers from Canada, United States and anglers referred by national or foreign companies. In all cases the correlation coefficient value is 0.53. There are no significant negative correlations.

Table 17. Correlation coefficient between business income and other characteristics

Variable	Correlation coefficient
Average number of anglers per day in high season	-0,07
Average number of anglers per day in low season	-0,03
Percentage of anglers with own boat or yacht	0,53
Percentage of anglers chartering or renting boat	0,43
Percentage of anglers taking a sportfishing tour	0,42
Percentage of US anglers	0,53
Percentage of Canadian anglers	0,53
Percentage of European anglers	0,52
Percentage of anglers from other countries excluding Costa Rica	0,53
Percentage of Costa Rican anglers	0,53
Number of employees in high season	0,01
Number of employees in low season	-0,04
Percentage direct contact	0,53
Percentage in all-inclusive package	0,53
Percentage referred by a foreign company	0,53
Percentage referred by a national company outside the region	0,53
Percentage referred by a national company within the region	0,52
Number of food and beverage suppliers in the area	-0,16
Number of supplies, repairs and materials suppliers in the area	-0,09
Number of tourist required to hire one more permanent employee	0,03
Number of tourist required to hire one more temporary employee	0,04
The company is a sportfishing tour operator	0,15
The company charters and rents sportfishing boats	0,02
The company sells fishing tackle	0,03
The company is a restaurant	0,21
The company is a tour package and general tour operator	0,16
The company has other activities	0,06
The company is an independent business part of an international or national chain	0,03
How dependent is your business on tourism activities	0,05
Describe how dependent is your business on sportfishing	0,16
How easy is it for your to purchase your main supplies	0,25
Is your margin higher or same than for similar companies?	0,11
Is your margin higher or same than for companies larger than yours?	0,18
Is your margin higher or same than for companies smaller than yours?	0,27

Source: IICE-UCR, Business Survey, August-September 2009

Part II

Commercial Fisheries Associated with Billfish in Costa Rica and Their Economic Contributions

Chapter 4

The Structure of Commercial Fisheries Management and Commerce in Costa Rica

The legal framework for fishing activities in Costa Rica is established in Law No. 8436 of 1 March 2005 “Law of Fisheries and Aquaculture”. Said Law regulates fishing and marine assets as well as the development of aquaculture through Instituto Costarricense de Pesca y Acuicultura (INCOPESCA).

The Law defines the fishing activity as a series of events connected with scientific, commercial and recreational fishing and aquaculture, as well as various processes such as transportation, marketing, industrialization and protection of aquatic resources. INCOPESCA’s functions include promoting the sustainable use of aquatic resources; considering the optimization of economic benefits versus preserving the environment, the health of the population and biodiversity conservation; promoting fishers organizations for fisheries and aquaculture, as well as for marine resources and marketing aquaculture; strengthening marketing tools and channels; developing information and communication channels; promoting technological research for the use of aquatic resources; establishing reserved areas for sportfishing activities; establishing emergency zones in coastal areas of the country to develop boat supply, repair and building activities.

The institution has focused on promoting training and support program through public institutions; protecting marine resources in the Pacific ocean upwelling area known as the “Thermal Dome”; regulating fish biomass to determine its sustainable use and management; and control of the management and protection of salt water fauna and flora. In addition, INCOPESCA classifies fisheries according to size and has defined commercial fisheries categories as follows:

- Small scale: Individual fishers in small boats in inland waters or coastal zones; the boats have a range of three nautical miles within Costa Rica’s territorial waters.
- Medium scale: individual fishers or companies in boats with fishing autonomy up to 40 miles.
- Large scale: Uses mechanical and hydraulic equipment. The boats can fish beyond 40 miles and are designed to capture pelagic and other important commercial species using longlines.
- Semi-industrial: Individuals or companies with specialized boats equipped for capturing shrimp, sardines or chasing tuna.
- Industrial: Fishing and industrialization carried out by individuals or corporations, with boats capable of freezing, packing and industrializing the catch on board.

One of INCOPESCA's achievements is Agreement AJDIP-476 from December 2008 prohibiting exports of sailfish.

The commercial fisheries value chain is described in **Error! Reference source not found.**. Fishers take their product to collection centers and there the product is cleaned, prepared and packed for wholesale distribution. Small, medium and large carriers deliver it to wholesale and retail markets. Other carriers distribute exclusively to hotels and restaurants.

Profit margins for the various marketing stages of some billfish are illustrated in Table 7. The price increases between 25% and 50% when the product is prepared and leaves the collection center. Later, value is added to the product by packing and preparing for wholesale, mainly. This profit is obtained by companies down the chain and the added value is about 66.7% of the price. From this point, the product is sold to wholesale distribution centers and retail stores, increasing the gross margin (cost to the consumer) by approximately 30%.

Figure 2: Fishing Industry Value Chain

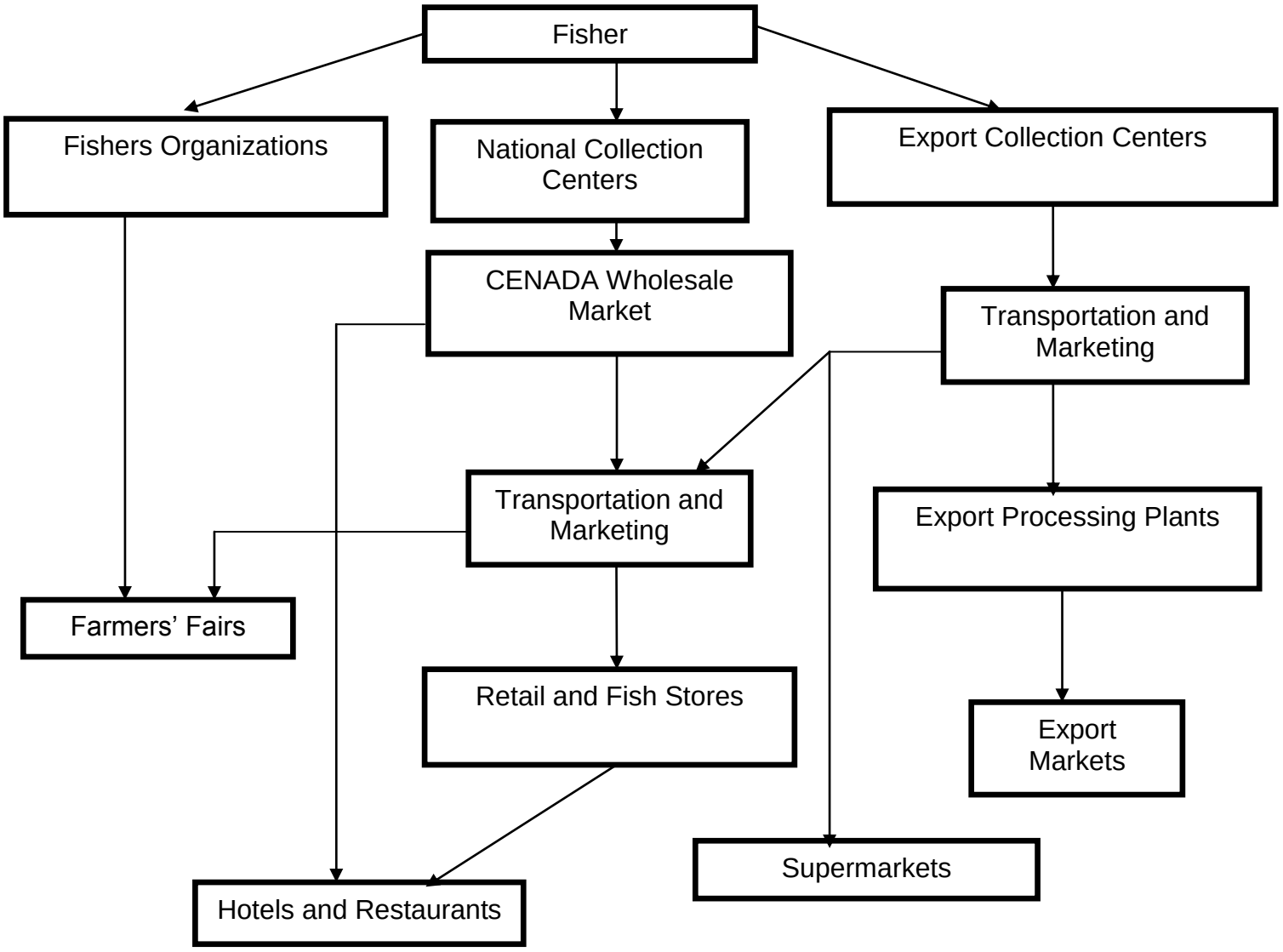


Table 7 Initial and final Prices for a Selected Group of Billfish (in Colones for July 2009)

PRODUCT	First Sale	%Value Added	Profit Margin	Gross Material Cost	%Value Added in First Sale	Other Expenses	Margin	Retail Price per Kilo	%Value Added by Retail Sale
SAILFISH FILET	700	50%	466.67	1,166.67	66.7%	200	410	1,776.67	30.00%
WHITE MARLIN FILET	3	25%	2000.00	5,000.00	66.7%	200	1560	6,760.00	30.00%
"PINK MARLIN" FILET	1.3	32%	866.67	2,166.67	66.7%	200	710	3,076.67	30.00%
MAHI-MAHI FILET Grade 1	1.2	50%	1200.00	2,400.00	100.0%	200	780	3,380.00	30.00%
MAHI-MAHI FILET Grade 2	950	48%	14.47	964.47	1.5%	150	334	1,448.81	30.00%

Source: Interviews with INCOPESCA and CENADA experts.

Chapter 5

Aggregated Value of Commercial Fishing for the Selected Species

One of the greatest limitations to quantifying the added value of commercial fisheries of billfish is the lack of disaggregated monthly statistics on the value (volume and price) of the various types of fish in the national account system. To obtain precise and exact information it is necessary to go to its source, namely INCOPESCA.

5.1 Commercial fisheries production value and foreign trade

Production value in millions of current dollars for all fisheries and aquaculture activities remained relatively constant between 2000 and 2007. In fact, the gross production value has been about US$360 million. Since the value has remained constant and the GDP has grown, participation of this sector in the national economy has decreased. In fact, for 2000, fisheries and aquaculture contribution was 2.27%, while for 2007 it was 1.38% (see Tables 19 and 20).

Table 8 Aquatic production value (at current prices and in US dollars)

	2000	2001	2002	2003	2004	2005	2006	2007	Annual Average
Price per ton (USD)	6,663.07	5,770.30	5,794.34	5,530.86	5,668.29	6,373.06	7,684.42	6,923.77	**6,301.01**
Production volume	54,407.77	61,132.91	75,188.57	51,530.67	62,089.15	60,813.14	48,194.28	52,421.23	**58,222.21**
Production value (millions)	**$362.52**	**$352.76**	**$435.67**	**$285.01**	**$351.94**	**$387.57**	**$370.34**	**$362.95**	**$366.86**

Source: INCOPESCA

Table 9 Summary of sector contribution to Costa Rica's GDP

Summary of Sectoral Contribution to Costa Rican GDP									
	2000	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**Annual Average**
National GDP (in millions US$)	15956.41	16365.51	16825.59	17515.93	18595.55	19961.03	22528.75	26267.03	19251.97
Primary Sector GDP	1707.34	1734.74	1699.38	1389.57	1454.8	1622.46	1808.08	1955.96	1671.17
Fisheries and Aquaculture GDP	362.52	352.76	435.67	285.01	351.94	387.57	370.34	362.95	363.59
Contribution of Primary Sector to the National Economy	10.7%	10.6%	10.1%	7.93%	7.81%	8.13%	8.03%	7.45%	8.84%
Contribution of Fisheries and Aquaculture to the National Economy	2.27%	2.16%	2.59%	1.63%	1.89%	1.94%	1.64%	1.38%	1.94%
Contribution of Fisheries and Aquaculture to the Primary Sector	21.23%	20.33%	25.64%	20.51%	24.24%	23.89%	20.48%	18.56%	21.86%
Sources: Banco Central de Costa Rica and Regional Workshop on Socio-Economic Indicators.FIINPESCA - FAO/OSPESCA/SUECIA Project									

Table 21 shows production decreases shown for harvests of shrimp, lobster and scale fish, among others. In summary, marine fisheries decreased from nearly 45,000 metric tons in 2000 to 27,000 in 2007.

Table 10. National Fisheries Production in Metric Tons

	2000	2001	2002	2003	2004	2005	2006	2007	Total Period	% of Harvests
Marine Fisheries	**44907.8**	**50622.9**	**57396.6**	**31282.7**	**37506.2**	**37244.1**	**28940.3**	**27122.2**	**315022.7**	**68%**
Tuna	20,226	24571.9	33622.9	12640.8	23659.5	22430.9	18657.1	17553.9	173363.1	37%
Shrimp	1048.7	812	859.5	1006.9	1115.4	1117.8	1155.9	148.9	7265.3	2%
Deep Water Shrimp	151.3	185.6	62.6	52.5	64.8	97.5	52	21.6	687.8	0%
Lobster	285.4	55.4	10.7	8.9	9.7	8.4	8.1	5.9	392.6	0%
Scale Fish	22675.2	24618.8	22479.9	17132.2	12387.8	13349.9	8,937	9244.8	130825.6	28%
Crab	4	3.1	2.9	1.4	8	7.3	1.3	1.5	29.5	0%
Squid	6.9	10.6	30.3	20.5	23	8.3	2.6	4.8	106.9	0%
Others	510.1	365.5	327.9	419.5	237.9	224.1	126.2	140.8	2,352	1%
Aquaculture	**9,500**	**10,510**	**17,792**	**20,248**	**24,583**	**23,569**	**19,254**	**25,299**	**150,755**	**32%**
Farm Shrimp	1,300	1,800	4,097	5,051	5,076	5,717	5,726	5,274	34,038	7%
Tilapia	8,000	8,500	13,190	14,679	18,987	17,328	13,000	19,489	113,173	24%
Trout	200	210	505	518	520	527	528	536	3,544	1%
Grand Total	**54407.8**	**61132.9**	**75188.6**	**51530.7**	**62089.2**	**60813.1**	**48194.3**	**52421.2**	**465777.7**	**100%**
Growth		**12.36%**	**22.99%**	**-31.46%**	**20.49%**	**-2.06%**	**-20.75%**	**8.77%**		

Source: INCOPESCA

On the other hand, fish exports have gradually decreased since 2000, while imports have increased. The positive trade balance of over US$110 million for 2001, decreased to about US$32 million in 2007 (see **Table 11**).

Table 11. Fisheries trade balance in Costa Rica (in US$)

Year	Exports	Imports	Balance
2000	115,645,336	19,696,192	95,949,144
2001	133,750,915	23,183,561	110,567,354
2002	122,303,676	24,928,054	97,375,622
2003	101,398,539	25,370,732	76,027,807
2004	89,220,676	28,522,154	60,698,522
2005	94,371,276	31,922,476	62,448,800
2006	79,644,926	37,247,755	42,397,171
2007	76,971,411	44,673,003	32,298,408

Source: Central American Fisheries and Aquaculture Socio-Economic Indicator Workshop 2009, country Costa Rica.

A similar situation is also evident when analyzing fisheries sector exports within total Costa Rica exports: its participation has decreased significantly since 2001. In that year, fisheries exports share was 2.7%, decreasing in 2007 to 0.8% (see **Table 12**).

Table 12. Contribution of Fisheries Sector to National Exports (in US$ x 1000)

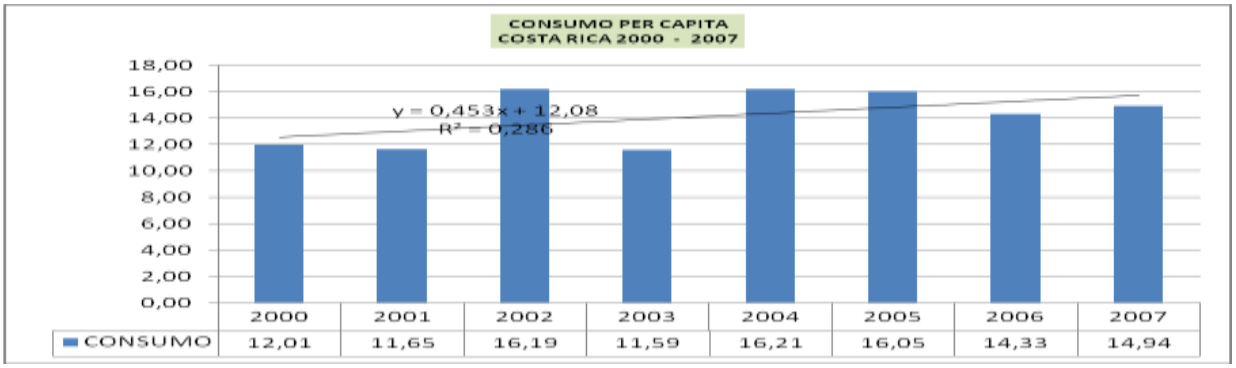
Year	National Exports	Export Fisheries Sector	Contribution
2000	5,931	116	1.9%
2001	5,04	134	2.7%
2002	5,294	122	2.3%
2003	6,122	101	1.7%
2004	6,281	89	1.4%
2005	7,005	94	1.3%
2006	8,196	80	1.0%
2007	9,343	77	0.8%

Source: Central American Fisheries and Aquaculture Socio-Economic Indicator Workshop 2009, country Costa Rica.

5.2 Per capita consumption of fisheries products

Figure 3. Per Capita Consumption of Fisheries Products (kilos per year) and Table 13 show consumption has averaged 14 kilos per year. However, there is an increasing trend of about 5%, independent of the economic cycle of fishing activities, represented by the volatility of the supply of fisheries and aquaculture products (see Figure 6). This indicates an increase in exports of these products or increased consumption of substitutes such as aquaculture products.

Figure 3. Per Capita Consumption of Fisheries Products (kilos per year)



Source: Central American Fisheries and Aquaculture Socio-Economic Indicator Workshop. 2008

Table 13. Fisheries Products Per Capita Consumption

	Apparent Consumption (kg)	Potential Consumer Population (5 - 80 years)	Per Capita Consumption (kg/person/year)
Year 2000	31,548,441	3,563,038	8.85
Year 2001	39,024,548	3,617,752	10.79
Year 2002	57,091,254	3,668,278	15.56
Year 2003	37,029,469	3,719,702	9.95
Year 2004	54,275,834	3,770,370	14.40
Year 2005	56,733,552	3,820,238	14.85
Year 2006	43,310,816	3,869,311	11.19
Year 2007	49,814,044	3,919,777	12.71
2000 – 2007 Average			12.29

Sources: INEC Costa Rica and SIECA

Note: 90% of total population of the country as potential consumers.

Figure 4. Fisheries Products Growth Rate

Source: IICE, with Central Bank data

5.3 Production Value of Commercial Fishing of Selected Species

The production value of commercial fishing of billfish and other species commonly targeted by anglers was estimated based on the list of catch volume of all species of interest, using data obtained from INCOPESCA.[11] With the volume and average price of the species of interest for the various years, a value in dollars was obtained. This value was weighted within the total for all commercial fisheries species. This led to the development of Table 25, which presents percentage participation of the gross production value of the species of interest, including and excluding catches of mahi-mahi.

[11] The species selected and compared for the commercial fisheries study are those that also attract sportfishing tourists to the country, namely: mahi-mahi (Coryphaena hippurus), sailfish (Istiophorus platypterus), striped marlin (sometimes known in Costa Rica as pink marlin (Tetrapturus audax)), blue marlin (known in Costa Rica as white marlin (Makaira mazara)), swordfish (Xiphias gladius), wahoo (Acanthocybium solandri), tuna ((Thunnus spp.), but mainly yellow fin tuna (Thunnus albacares)), snook (Centropomus spp), and tarpon (Megalops atlanticus). It is possible that black marlin (Makaira indica) is captured by the commercial fleet and included with the other species of marlin mentioned above.

Table 14. Percentage participation of species studied in total commercial catches

	2003	2004	2005	2006	2007	2008	2009
Without mahi-mahi	19.68%	18%	22%	29%	19%	18%	14%
With mahi-mahi	20.02%	17.59%	22%	33.15%	18.61%	19.45%	17.91%

Source: IICE with INCOPESCA information

For 2007, Costa Rica's GDP was US$26.5 billion and the aggregated value of the whole Agriculture, Forestry and Fisheries sector (AFF) was US$2.5 billion, for a 9.73% share. Therefore, it was estimated that the aggregated value of the species of interest to this study for 2007 was US$1.8 million or 0.007% of GDP.

For 2008, GDP was US$29.8 billion and the aggregated value of the species of interest to this study was US$1.9 million, while AFF was US$2.8 billion. GDP share of commercial fisheries of the selected species was 0.007% again.

In addition, Table 15 shows export behavior for the species of interest in this study. The value and participation share were calculated in the same way as participation share in aggregated value, except the procedure was carried out for exports. It is important to remember that the regulation prohibiting sailfish exports was approved in December 2008, which may explain the sudden change in the 2009 ratio.

Thus, participation of the selected species in national exports starts to decline in 2008. Despite the 11.6% growth in total exports of fish from 2007 and 2008, the participation of the selected species declined by over 50%. Exports of selected fish species totaled US$16 million in 2005 and US$8.1 million in 2008. As of May, exports of these species were totaling approximately US$150 thousand.

Table 15. Exports of Selected Species (in dollars)

	2005	2006	2007	2008	2009*
National Total	$94,371,276	$79,644,926	$76,971,411	$85,863,812	$30,016,118
Species Studied	$16,680,418	$20,093,871	$16,985,736	$8,143,944	$149,864
Share	17.68%	25.23%	22.07%	9.48%	0.50%

*/ Accumulated through May 2009.
Source: IICE, with INCOPESCA information.

Part III

Comparative Analysis of the Economic Impact of Sport and Commercial Fishing For Species of Interest in Costa Rica

Chapter 6

Estimation of the Impact of Commercial Fisheries for Selected Species on the Economy of Costa Rica

6.1. Methods

Recognizing only a few commercial fisheries overlap competitively with sportfisheries, harvests for species such as shellfish, non-game fish or distant water fisheries were excluded from this analysis. Only those fisheries also targeted by sportfisheries were of concern.[12] The Gross Domestic Product (GDP) contributions for these selected commercial fisheries were estimated by analyzing their effects on supply and demand. The demand effect is estimated through private consumption of this good (through marginal changes in fish consumption) and the supply effect through gross capital formation (marginal changes in business investment). This last variable is indicative of investment levels, which is a common and popular measure of economic growth in Costa Rica. Amounts spent for private (per-capita) consumption of commercial fish products is used to measure income effects on commercial fishing-related businesses.

The effects from private consumption and companies are then used in an economic model to determine the economic effects to the Costa Rican economy (see Appendix 2). This model identifies the relation and behavior of the main macroeconomic variables. During model development, some adaptations were made to the consumption and investment equations, thus specifying a functional form for the object of study of this investigation.

To quantify the effect of commercial fisheries of the selected species on private consumption, first we obtained an estimate of per capita consumption of these fish. Later, apparent consumption (production plus imports less exports) was inferred to estimate national consumption.

The investment effect was obtained directly from the historic percentage of the investment/GDP ratio in the national economy, since no statistics exist of the ratio for companies in the commercial fisheries sector. Thus the effect of this investment ratio for the selected species was calculated in the national accounts. Based on the estimated gross value of commercial fisheries for the selected species on national production national, the investment in the sector results in 24% relative to value added.

For the purpose of measuring national accounts, a new variable was developed called AFF, representing the contribution of Agriculture, Forestry and Fisheries to Costa Rica's Gross Domestic Product as reported by the Central Bank (Table 16).

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12 [12] The species selected and compared for the commercial fisheries study are those that also attract sportfishing tourists to the country, namely: mahi-mahi (Coryphaena hippurus), sailfish (Istiophorus platypterus), striped marlin (sometimes known in Costa Rica as pink marlin (Tetrapturus audax)), blue marlin (known in Costa Rica as white marlin (Makaira mazara)), swordfish (Xiphias gladius), wahoo (Acanthocybium solandri), tuna ((Thunnus spp.), but mainly yellow fin tuna (Thunnus albacares)), snook (Centropomus spp), and tarpon (Megalops atlanticus). It is possible that black marlin (Makaira indica) is captured by the commercial fleet and included with the other species of marlin mentioned above.

Table 16. GDP Items at Constant Prices for 2008 (in Millions of 1991 Colones)

Gross Domestic Product by Industry at Constant Prices, by quarter **In Millions of 1991Colones**				
	2008 I	**2008 II**	**2008 III**	**2008 IV**
Gross Domestic Product at Market Prices	528,885.7	525,900.1	524,269.8	513,309.0
Less: Taxes on products and imports (net of subsidies)	46,131.3	46,106.5	46,574.5	48,802.0
Gross Domestic Product at basic prices	482,754.4	479,793.7	477,695.3	464,506.9
Agriculture, forestry and fisheries	*55,120.4*	*50,905.6*	*45,106.3*	*45,048.5*
Mining and quarries	470.6	489.7	373.1	648.5
Manufacturing industry	116,328.5	120,983.1	121,360.2	99,084.4
Construction	24,909.2	25,093.5	25,423.2	24,982.8
Electricity and water	13,947.3	14,147.7	13,867.6	13,756.1
Business, restaurants and hotels	86,032.7	81,013.7	82,723.6	90,424.1
Transportation, storage and communications	76,729.7	76,136.7	76,589.2	77,072.8
Financial services and insurance	26,512.3	27,283.0	27,334.7	27,796.5
Real estate	22,479.5	22,711.6	22,882.2	22,992.2
Other services rendered to companies	22,537.7	23,201.9	23,681.1	23,976.3
Public administration services	9,718.3	9,775.2	9,827.1	9,874.3
Community, social and personal services	46,257.8	46,768.7	47,142.5	47,580.3
Less: Financial intermediation services measured indirectly (SIFMI)	18,289.5	18,716.9	18,615.3	18,729.9

Source: Banco Central de Costa Rica

Source: BCCR. National Accounts.

Two initial calculations were necessary to analyze the effect of consumption: the first consisted in obtaining the contribution of Agriculture, Forestry and Fisheries to gross production values in nominal terms. Later, this was calculated in real terms (See **Error! Reference source not found.**).

Table 17. Breakdown of AFF calculation in nominal terms for 2008 (in million of colones)

Quarter	**Real GDP**	**Real AFF**	**Nom GDP**	**Deflator**	**Nominal AFF**
2008 I	5,288,885.7	55,120.4	3,883,150.6	734.2	404,701.3
2008 II	525,900.1	50,905.6	3,834,414.6	729.1	371,160.1
2008 III	524,269.8	45,106.3	3,878,773.7	739.8	333,715.5
2008 IV	513,309.0	45,048.5	4,017,230.5	782.6	352,556.3

Source: IICE with Banco Central de Costa Rica information

The variables used in the calculation were defined as follows:

- AFF: Contribution of Agriculture, Forestry and Fisheries to Gross Production Value.
- Pub Real: Gross Domestic Product in 1991 prices published by Banco Central de Costa Rica.
- PIB Nominal: Gross Domestic Product in current prices published by Banco Central de Costa Rica.
- Deflator: The implicit deflator of the Gross Domestic Product.

6.2 Consumption Effect

In the National Accounts of the Central Bank (BCCR), total fisheries represent 0.07% of the total for “Agriculture, Forestry and Fisheries” activities. To measure the effects of commercial fisheries for the selected species, the economic simulation was first run with AFF included and again running it with commercial fisheries for the selected species eliminated (AS variable). Please recall that approximately 20% of the gross production value of commercial fisheries originates from commercial fisheries for the species of interest (see Part II of this document), compared to shrimp, lobster and other non-sport species.

Apparent consumption of fisheries products was estimated and the result is approximately 95% of the gross production value for the selected is from internal consumption. This relation is illustrated in Table 18.

Table 18 Per Capita Consumption of Fisheries and Aquaculture Products in Kilos

	National Production (1)	Imports (2)	Exports (3)	Apparent Consumption (1) + (2) - (3)
Year 2000	54,407,766	10,328,081	33,187,406	31,548,441
Year 2001	61,132,907	22,367,664	44,476,023	39,024,548
Year 2002	75,192,664	28,705,110	46,806,520	57,091,254
Year 2003	51,535,717	25,820,208	40,326,456	37,029,469
Year 2004	62,094,230	24,962,973	32,781,369	54,275,834
Year 2005	60,818,855	27,320,292	31,405,595	56,733,552
Year 2006	48,200,006	21,385,670	26,274,860	43,310,816
Year 2007	52,426,500	22,685,012	25,297,468	49,814,044

Sources: INCOPESCA and SIECA

Note: Only includes data for production, exports and imports of products for human consumption. Chapter 03 and positions 16.03, 16.04 and 16.05 of SAC tariff nomenclature. Excludes position 23.01 - Fishmeal not apt for human consumption.

It can be seen that 95% of national production is for internal consumption. The effects on GDP from this consumption can be estimated by multiplying the “Agriculture, Forestry and Fisheries” (AFF) contribution by 0.07% to derive the GDP from fisheries, then multiplying it by 20% to identify just the portion attributable to the species of concern to this report. By multiplying the result by 95% (the portion related to internal consumption), an estimate of impact from the loss of internal consumption of these species would be available.

6.2.1 Specification and identification of the single equation model for consumption: dependent and independent variables

A dependent variable is the item or event you want to explain after analyzing a set of independent or explanatory variables. In our case, the dependent variable is the change on national private consumption of the selected species at various prices. Prices are later converted to U.S. dollars using a quarterly exchange rate average.

Independent variables are those that were selected to explain the behavior of the dependent variable, which in this case is private consumption. These variables are:

a) Private consumption (CO): Refers to private consumption using daily data published in the Central Bank's website.
b) Agriculture, Forestry and Fisheries (AFF): These data correspond to the contribution in absolute terms of the Agriculture, Forestry and Fisheries industry on real GDP, translated to nominal terms by using the implicit deflator of the Gross Domestic Product.
c) Dummy variable for the fourth quarter of each year, as it has an abnormal consumption effect when compared to the other quarters and is well defined in time.

We can calculate an investment equation according to the following specification:

Log(CO) = C(1) + C(2)*Log(co(-1)) + C(3)*Log(asp(-1)) + C(4)*D4

A logarithmic model (log-log) is used to identify the change in consumption contributed by each independent variable. Estimated results are as follows (**Table 19**):

Table 19. Estimation of Consumption Function in the Commercial Fisheries Model

CONSUMPTION FOR COMMERCIAL FISHERIES		
Dependent variable:LOG(CO)		
Ordinary Square Minimums		
Period 1991:4 2008:4		
71 Observations		
Variable	Coefficient	Prob.
C	-1.95432	0.0001
LOG(CO(-1))	0.835347	0
LOG(ASP(-1))	0.164205	0
D4	0.165312	0
R-Square	0.997609	
R-Adjusted	0.997502	

Source: IICE with results and outputs obtained from Eview Econometric Package

Since the intent is to quantify the effect of the selected fisheries on national consumption, the effect of a variation in the contribution of fisheries to the "Agriculture, Forestry and Fisheries" (AFF) industry will be analyzed. To do so, the variable AFF is modified by eliminating the portion attributable to internal (domestic) consumption of the selected species to generate a new variable called "Agriculture, Forestry and Fisheries WITHOUT CONSUMPTION" (AFFWC). The results indicate that the consumption of commercial fisheries depend n the private consumption in previous periods, the production value of this fishes and the seasonality. We note that the elasticity of the consumption of commercial fisheries depend n the private consumption in previous periods (0.83) is much higher than the elasticity for commercial fisheries for the selected species (0.16).

6.2.2 Main Results

Using this equation we can simulate how much the private consumption of the selected species depends on the investment in this sector. We calculated that 5% could be the reduction of this consumption in 2008 if there were not any capital investment in this activity in that year.

6.3 Investment effect

To estimate the effect of commercial fisheries for the selected species in the national economy, we have to estimate the demand and supply effect measured by the consumption and investment relationship in the GDP. This effect is analyzed under the argument that fishing activities require a significant capital component. This is easily observed as commercial fishing requires intensive use of small and large vessels, and sportfishing depends on infrastructure, transportation and trade investments in general. First at all, the long term relationship between investment and production at national level has been approximately 24%, according to historical data. We also assume that the relationship between investment and GDP in this activity is 24%, so we can expect that any dollar generated by the commercial fisheries for the selected species generates 24 cents of investment.

Next, we use a single equation model to establish the relationship between interest rate, gross formation of fixed capital in previous periods and the nominal contribution of the Agriculture, Forestry and Fisheries industry to Gross Domestic Product.

6.3.1 Specification and identification of the single equation model for gross formation of capital: dependent and independent variables

Gross formation of fixed capital (FBKF) is set at current prices, and is later converted into dollars using the quarterly exchange rate average. Independent variables are those that were selected to explain the behavior of the dependent variable, which in this case is investment. Each independent variable is explained as follows.

a) Basic passive rate (TBP): Refers to be basic passive rate using daily data published in the Central Bank's Website.
b) Gross formation of fixed capital (FBKF): Refers to gross formation of fixed capital at current prices calculated by the Central Bank, including delay.
c) Agriculture, Forestry and Fisheries (ASP): corresponds to the contribution in absolute terms of the Agriculture, Forestry and Fisheries industry on real GDP, translated to nominal terms by using the implicit deflator of the Gross Domestic Product.
d) In different estimates other variables are used such as external interest rates, potential product gap and delayed growth of Gross Domestic Product.

Based on the construction of these variables, you calculate an investment equation according to the following specification

Log(fbkf) = c(1) + c(2)*log(I(-1))+c(3)*log(FBKF(-2))+c(4)*log(ASP)

A logarithmic model was developed to examine the dependent variable and another logarithmic model was developed for the exploratory variables (log-log) to find the percentage contribution of each factor to the percentage variation of gross formation of fixed capital (elasticities). Estimation results are presented in Table 20.

Table 20. Results of Single Equation Model Estimate for Gross Formation of Fixed Capital

FBKF FOR COMMERCIAL FISHERIES		
Dependent variable:LOG(FBKF)		
Ordinary Square Minimums		
Period 1991:3 2008:4		
71 Observations		
Variable	Coefficient	Prob.
C	1.73266	0.0026
LOG(I(-1))	-0.179511	0
LOG(ASP(-1))	0.314324	0
LOG(FBKF(-2))	0.648424	0
R-Square	0.992975	
R-Adjusted	0.992656	

Source: IICE with results and outputs obtained from the Eview Econometric Package

To observe the impact of fishing on investments at the national level, the effect of a variation in the contribution of fishing to the “Agriculture, Forestry and Fisheries” (AFF) industry was analyzed to permit the variable (AFF) to be modified by eliminating the proportion associated with commercial and recreational fishing. The results generate a new variable called “Agriculture, Forestry and Fisheries WITHOUT FISHERIES INVESTMENT” (ASPSI).

As already commented, the gross capital formation of commercial fisheries depends on the interest rate, the AFF variable and previous gross capital formation. The result shows that the elasticity of the previous period of gross capital formation (0.64) is higher than the elasticity of the contribution in absolute terms of the Agriculture, Forestry and Fisheries industry on real GDP (0.31). There is also a negative relationship between investment and the interest rate and the elasticity (in absolute terms) of 0.17, less than the elasticity of AFF and the elasticity from the previous period of gross capital formation.

6.3.3 Main Results for Investment

Among the main results obtained we should highlight the fact that gross formation of fixed capital in Costa Rica, in all economic sectors combined, would have decreased by about 0.24%, in case no investment would have been made in commercial fisheries associated with the selected species. It should be noted that the proportions of investment and income, as well as investment and product, were obtained from the business survey taken by Instituto de Investigaciones en Ciencias Economicas.

6.4 Simultaneous determination of the impact of commercial fishing of selected species in gross formation of fixed capital and consumption

The equation system consists of an investment equation, a consumption equation and finally an equation for Gross Domestic Product. The purpose of this system is to determine the impact of commercial fishing simultaneously on fixed capital and consumption by consumers, as described:

- PIB f(M1, fbkf, TC), that indicates that the GDP depends on the money supply (M1), gross formation of capital (fbkf) and the exchange rate (tc);
- FBKF f(I, FBKF, ASP) indicates that gross formation of capital depends on interests rates (I), gross formation of capital in previous periods (FBKF) and the ASP variables;
- CO f(CO, ASP, D4) underlines that consumption is a function of consumption in previous periods (CO), seasonal consumption in the fourth quarter (D4) and the ASP variable.

The results of the simultaneous equation model estimation are illustrated below. Table 21 illustrates the elasticities (or marginal propensity to consume and invest) or the estimation coefficients of the functional equations proposed, indicating that for GDP, the weight of private consumption is higher than the effect of gross formation of capital (coefficient of 0.3 versus 0.83). That is to say, for this sector, marginal propensity to consume more than doubles the marginal propensity to invest.

Furthermore, these coefficients directly influence the gross formation of capital and consumption equations and these will influence the GDP equation. We note that the effect of commercial fisheries of the selected species is greater for the gross formation of capital equation (elasticity of 0.31 in the C(7) variable) than for consumption (elasticity of 0.16 in the C(11) variable). Despite the above, the consumption effect is much higher than the investment effect in the short term on GPD, meaning the effects of an expansion of commercial fisheries would have a near immediate impact in consumption.

Table 21. Simultaneous Equation Model Estimation

Simultaneous Equation System		
Método de estimación: Mínimos Cuadrados Ordinarios		
Data Range 1991:01 to 2008:04		
71 Observations		
	Coefficients	Prob.
C(1)	9.076099	0
C(2)	0.215858	0
C(3)	0.34621	0
C(4)	0.699585	0
C(5)	1.73266	0.002
C(6)	-0.179511	0
C(7)	0.314324	0
C(8)	0.648424	0
C(9)	-1.95432	0.0001
C(10)	0.835347	0

C(11)	0.164205	0
C(12)	0.165312	0

Equation 1: LOG(PIB) = C(1) + C(2)*LOG(M1(-1)) + C(3)*LOG(FBKF(-3)) * + C(4)*LOG(TC(-1))

R-Square	0.997197
R-Adjusted	0.997067

Equation: LOG(FBKF) = C(5) + C(6)*LOG(I(-1)) + C(7)*LOG(ASP) + C(8)*LOG(FBKF(-2))

R-Square	0.992975
R-Adjusted	0.992656

Equation: LOG(CO) = C(9) + C(10)*LOG(CO(-1)) + C(11)*LOG(ASP(-1)) +C(12)*D4

R-Square	0.997609
R-Adjusted	0.997502

Source: IICE with results and outputs obtained from Eviews Econometric Package

Quantification of these effects in the general balance macro-econometric model equations is done in two ways: analyzing the effect of excluding commercial fisheries of the selected species on consumption and investment –and thereby estimating its effects on the GDP, versus comparing the result without excluding this effect on national consumption and investment variables.

Table 22 shows the effects of commercial fisheries of the selected species on GDP. The comparison is done by omission, meaning it answers the question of what would happen in the economy if this activity did not generate value added.

When analyzing the estimation with and without commercial fisheries of these species, both for consumption as well as investment, an important net effect can be observed of nearly -0.24%, this means that in case there was no investment in commercial fisheries corresponding to the proportion of production they represent, Costa Rica's GDP would decrease by US$16 million in 2008. This decrease is the result of the marginal propensity to invest and the coefficients of elasticity of investment in that sector, described above.

The greatest effect occurs in national consumption, which would be reduced by 5.8%, or approximately US$1.143 billion. The explanation for this coefficient is the marginal propensity for private consumption and, in particular, the consumption of this type of good. The simultaneous effect on GDP is a reduction of approximately 1.88%, i.e., the GDP would decrease by US$527 million.

Table 22. Impact on Gross Domestic Product and Taxes of Reduction in Consumption and Investment of Commercial Fisheries of the Selected Species in 2008 (x US$1,000)

Commercial Fisheries	**With Commercial Fisheries**	**Without Commercial Fisheries**	**Absolute Change**	**Percentage Change**
Gross Domestic Product	28,141,491	27,613,656	-527,835	-1.88%
Gross Formation of Fixed Capital	6,813,218	6,796,615	-16,603	-0.24%
Consumption	19,619,453	18,476,031	-1,143,422	-5.83%

Taxes (13%)	-68,619

Source: IICE with econometric model results

Considering that the tax burden in relation to the GDP has historically been about 13%, the result would be that the government tax revenues would decrease by approximately US$68 million.

6.5 Analysis of the Impact on Employment by Commercial Fisheries of Selected Species

To estimate the commercial fishing's impact on aggregated employment, a methodology of total production factors was used. In this methodology, production can be broken down into factors to estimate how much of the capital effect or the employment effect is necessary to generate a certain number of production units. Or, from the opposite point of view, to produce one unit of product in the economy, you require so many units of work, capital and other productive factors, using a fixed level of technology (state of the art) given by the economy. This relation of total productivity of factors for Costa Rica has been developed, among others, by Esquivel and Rojas (2007). In this study, production growth is broken down into employment and capital factors.

It is assumed that production of the economy follows a neoclassic Cobb-Douglas function $Y=AK^{\alpha}L^{(1-\alpha)}$, where Y is the level of real national production, K is the total sum of capital, L represents the work input and A represents the total level of productivity of the factors. By applying logarithms and time derivations, the following expression is obtained: $y=a+\alpha k+(1-\alpha)l$. Here, "y" is the national production growth rate, "a" is the residual change in total productivity of the factors, "l" is the employment growth rate and "k" is total capital growth rate. Components α and (1-α) represent, respectively, the coefficient of remuneration to capital in the total product, and coefficient of remuneration to the work factor in the total product.

Total production growth is obtained by simulating the impact of commercial fisheries on economic growth in 2007-2008, which is approximately 1.9% in nominal terms. This growth can be divided by the employment and capital effect. The sum of both must be equal to the unit being produced when the production function has constant returns of scale. Esquivel and Rojas (2007) estimated this equation for Costa Rica in 1991-2006, and found that $\alpha=0.35$. It means that the coefficient of the share of capital in the total product is 0.35 and 0.75 is the share of labor in the total product.

In the previous section the effect on Gross Domestic Product was estimated using an assumption of no commercial fisheries of the selected species. Based on this result, we wanted to see what the effect would be on economic growth, and using the methodology of total productivity of factors to simulate impact on employment. Therefore, if $l=(y-a-\alpha k)/(1-\alpha)$ and it is assumed growth occurs without an increase in capital (i.e., all change is due to increased employment), and at the same time a simulation with and without commercial fisheries "ceteris paribus" does not have an effect on total productivity of the factors, the result would be that employment would grow by approximately 2.9%. This effect in general is on the

employment factor, without taking into account the various types or quality of employment. That is, the total accumulation of employment in the country's economy will be:

l=(0,19)/(1-0.35)= 2.9%

It is important to stress that this result reports the decrease of all employment due to the elimination of commercial fishing's contribution for the selected species to national production. At the same time, it should be stressed that, in case any impact exists on investment from the elimination of fisheries on the Gross Domestic Product, it would affect the accumulation of capital, and the effect on employment would be expected to be less. Unfortunately, the accumulation of capital is not available to estimate its percentage change. In addition, the result will depend on the effect on the total productivity of the factors.

However, the above discussion indicates that in two scenarios, one with commercial fisheries and the other without, we obtain a difference of 1.9% in nominal growth, so under the assumptions mentioned above, it could be inferred that if commercial fisheries for the selected species ceased, employment in other sectors of the Costa Rican economy would need to grow 2.9% to compensate for the job loss, equivalent to about 57,000 workers. The Costa Rican labor force in 2008 was over 1.9 million workers.

Chapter 7
Estimation of the Impact of Sportfishing on the Costa Rican Economy

7.1. Methods

Recreational fishing by foreign tourists, in the short term, has an effect on private consumption and national investment. Anglers generate foreign currency through their expenditures, but also through their effect on gross formation of capital through their payments to businesses, hotels and others. Thus, anglers' provision of foreign income enhances Costa Rica's Gross Domestic Product.

One of the primary effects of sportfishing tourists' expenditures is on "Hotel and Restaurant" activities, which in turn directly impact consumption and investment in many other sectors. To estimate the final effect of anglers' introduction of foreign currency to the Costa Rican economy, an econometric model developed by IICE was used (see Appendix 2).

Sportfishing expenditures by Canadian and U.S. anglers were used to measure the economic effects of this activity on GDP. Surveys were used to collect angler expenditures (see Chapter 2) and understand how these dollars are used by businesses (see Chapter 3). The income/investment ratio of tourist companies was around 30%, according to the estimate based on the survey taken at these facilities. To this effect, a determination had to be made on the GDP component that best reflects angler expenditures and there was expert agreement on "Businesses, Restaurants and Hotels".

In our economic simulation, two calculations have to be made. First, we have to obtain the contribution by Businesses, Restaurants and Hotels to the gross production value. This is done in nominal terms. Second, we have to calculate this value in real terms. So, we first divide each term in each year by the price index of 1991, and then multiply it by the implicit deflator of the Gross Domestic Product to convert into real terms.

7.2 Consumption Effect

With the intention to have the effect of the expenditures of the sportfishing tourists on private consumption, we have to subtract from the national aggregated sales by the sector, the amount of anglers' expenditures to Businesses, Restaurants and Hotels. In order to have how much this tourist spends in this sector, we use data on the percentage of sales from facilities in this sector to other facilities which come specifically from the survey (hotels and businesses) conducted in 2009 by the IICE.

7.2.1 Specification and identification of the single equation model for consumption: dependent and independent variables

The consumption item corresponds to national private consumption at current prices, converting its later value to dollars using the average quarterly exchange rate. Independent variables are those that were selected to explain the behavior of the dependent variable, which in this case is private consumption. The independent variables are:

a) Private consumption (CO): Refers to private consumption using daily data published in the Central Bank's Website.
b) Businesses, Restaurants and Hotels (CRH): These data correspond to the contribution in absolute terms of the industry dedicated to business and hotels on real GDP, translated to nominal terms by using the implicit deflator of the Gross Domestic Product and later converted into dollars using the quarterly exchange rate average.
c) Dummy variable for the fourth quarter of each year, as it has an abnormal consumption effect when compared to the other quarters and is well defined in time.

Based on the construction of these variables, you calculate an investment equation according to the following specification

Log(CO) = C(1) + C(2)*Log(co(-1)) + C(3)*Log(crh(-1)) + C(4)*D4

Then you calculate a logarithmic model for the dependent variable and a logarithmic model for the exploratory (independent) variables (log-log) to find the percentage contribution of each factor to the percentage variation of consumption (elasticities). The effect in the short term on private consumption in the economy is stronger in terms of past consumption that the effect of the industrial production of the hotel and business sector. The elasticity of the first item is 0.73, while for the second it is 0.26. The results are shown in

Table 23. In other words, when faced with decreased foreign income generated by the tourism sector, the strongest effect is for private consumption rather than on the hotel and business industry, given the diversification this sector may have in terms of their physical location and small and medium-size companies.

Table 23 Estimation of the Consumption Function in the Sportfishing Model

Dependent Variable: LOG(CO)		
Ordinary Square Minimums		
Period 1991:4 2008:4		
71 Observations		
Variable	Coefficient	Prob.
C	-3.182327	0
LOG(CO(-1))	0.733276	0
LOG(CRH(-1))	0.261807	0
D4	0.156873	0
R-Square	0.99783	
R-Adjusted	0.997731	

Source: IICE con resultados y salidas obtenidas del Paquete econométrico Eview

Since the intent is to quantify the effect of angler expenditures on national consumption, the effect of a variation in the expenditures for Businesses, Restaurants and Hotels will be analyzed. The variable (CRH) is modified by eliminating the proportion attributable to recreational fisheries to generate a new variable called "Businesses, Restaurants and Hotels WITHOUT ANGLER CONSUMPTION EXPENDITURES" (CRHSGTI). The effect of not having anglers dollars then becomes apparent when the results are compared to the simulation that included angler dollars.

7.2.2 Main Results

Among the main results it should be highlighted that consumption in Costa Rica would have decreased by approximately 5% if investments based on angler expenditures were not made. It should be noted that the consumption proportions were obtained from the analysis of angler expenditures in hotels and businesses.

7.3 Investment Effect

In the case of investment, the business survey considered the amount of investment made by companies for each unit of income received. This ratio was used to estimate the percentage of U.S. and Canadian anglers' expenditure that would ultimately be dedicated for investment by business. Since we want to observe the impact on investment, an estimate was made of the relationship between investment and national production, which is approximately 30.2%. Based on this coefficient, we estimated the percentage of investment by the facilities and we obtained an estimated GDP without investment due to sportfishing; versus real level of investment of the economy. The difference is the effects created by anglers' dollars. The data are presented in Table 24

Table 24. Investment/Income Relation in Businesses and Hotels Catering to Sportfishing

Staff and employees	Consumption	4,954,351
Investment in new construction	Investment	1,689,876
Investment in new vehicles	Investment	709,101
Investment in new furniture and equipment	Investment	53,996
Investment in new boats and fishing tackle	Investment	9,273
Other new investments	Investment	49,055
Expenses in facilities maintenance	Consumption "depreciation"	4,354,005
Expenses in furniture and equipment maintenance	Consumption "depreciation"	2,184,253
Expenses in vehicle maintenance	Consumption "depreciation"	79,673
Expenses in boat and fishing tackle maintenance	Consumption "depreciation"	56,054
Other maintanent expenses	Consumption "depreciation"	177,624
Food and beverage operational expenses	Consumption "operational"	3,138,728
Raw materials and inputs operational expenses	Consumption "operational"	1,701,279
Gastos en servicios	Consumption "operational"	2,263,592
Municipal and other permit expenses	Consumption "operational"	149,312
Income tax payment expenses	Consumption "operational"	436,271
Financial expenses	Consumption "operational"	1,722,337
	Total Expenses	***23,728,779***
	Total Income	**30,995,043**
	Investment without maintenance expenses	**2,511,301**
	Investment with maintenance expenses	**9,362,909**
	Investment/Income Ratio	**30.2%**

Source: In-house based on Business and Hotel Survey.

7.3.1 Specification and identification of the single equation model for gross formation of capital: dependent and independent variables

Gross formation of fixed capital (FBKF) is based on fixed capital at current prices. This value is later converted into dollars using the quarterly exchange rate average. Independent variables are those that were selected to explain the behavior of the dependent variable, which in this case is capital investment. The independent variables are:

a) Basic passive rate (TBP): Refers to be basic passive rate using daily data published in the Central Bank's Website.
b) Gross formation of fixed capital (FBKF): Refers to gross formation of fixed capital at current prices calculated by the Central Bank, including delay.
c) Businesses, Restaurants and Hotels (CRH): corresponds to the contribution in absolute terms of the business and hotel industry on real GDP translated to nominal terms by using the implicit deflator of the Gross Domestic Product and later converted into dollars using the quarterly exchange rate average.

Based on the construction of these variables, you calculate an investment equation according to the following specification

Log(fbkf) = c(1) + c(2)*log(I(-1))+c(3)*log(CRH(-1))+c(4)*log(FBKF(-2))

Logarithmic models for the dependent variable and the exploratory (independent) variables (log-log) were developed to find the percentage contribution of each factor to the percentage variation of gross formation of fixed capital (elasticities). The elasticity of gross formation of capital with respect to investment in previous periods (0,4) has greater effect on determining investment in the current period than past production in the Businesses, Restaurants and Hotels sector (0.5), as illustrated in Table 25.

Table 25. Results of Single Equation Model Estimate of Gross Formation of Fixed Capital

Dependent Variable:LOG(FBKF)		
Ordinary Square Minimums		
Period 1991:3 2008:4		
71 Observations		
Variable	Coefficient	Prob.
C	1.324151	0.0156
LOG(I(-1))	-0.181017	0
LOG(CRH(-1))	0.47081	0
LOG(FBKF(-2))	0.501457	0
R-Square	0.993572	
R-Adjusted	0.99328	

Source: IICE with results and outputs obtained from the Eview Econometric Package

To observe the impact of angler expenditures, the effect of a variation in the contribution of expenditures in Businesses, Restaurants and Hotels will be analyzed, so that the variable (CRH) can be modified by eliminating the proportion of commercial and recreational fishing, to later eliminate the proportion of internal consumption within that industry that is destined for investment, in order to generate

a new variable called “Businesses, Restaurants and Hotels WITHOUT ANGLER INVESTMENT (CRHSGTI).

7.3.2 Main Results

Estimated gross formation of fixed capital using the equation described above requires a simulation to estimate gross formation of fixed capital results for 2008, in case there was no investment in the fisheries sector. This is obtained from the relationship between investment and income (production) for the facilities. These facilities are representative for sportfishing-related businesses and shall represent their marginal propensity to invest. This relationship applies for investments in total fisheries and from there the effect on GDP is estimated.

Among the main results obtained we can highlight the fact that gross formation of fixed capital would have fallen by about 3%, in case there were no investment in the hotel and business sector; in addition, the proportions of investment and income, as well as investment and product were obtained from the survey taken by Instituto de Investigaciones en Ciencias Economicas.

7.4 Simultaneous determination of the impact of sportfishing in formation of fixed capital and consumption

The equation system consists of an investment equation, a consumption equation and finally an equation for Gross Domestic Product. The purpose of this system is to solve it simultaneously as described in the following:

- PIB f(M1, fbkf, TC), that indicates that the GDP depends on the amount of money (M1), gross formation of capital (fbkf) and the exchange rate (tc).
- FBKF f(I, FBKF, CRH) indicates that gross formation of capital depends on interests rates (I), gross formation of capital in previous periods (FBKF) and industrial production of the business, hotel and restaurant sector (CRH).
- CO f(CO, CRH, D4) underlines that consumption is a function of consumption in previous periods (CO), seasonal consumption in the fourth quarter (D4) and industrial production in the business, hotel and restaurant sector (CRH).

Table 26 shows that, for this sector, marginal propensity to consume is higher than the marginal propensity to invest. Furthermore, these coefficients directly influence the gross formation of capital and consumption equations and these will influence the GDP equation. However, the effect of sportfishing is greater for the gross formation of capital than for consumption. The consumption effect is much higher than the investment effect in the short term on the GPD, so that the effects of an expansion of sportfishing activities would be represented in the immediate term in consumption. A similar effect is observed in relation with the industrial value added of hotels, business and restaurants, since their elasticity is only 0.4 versus 0.7 for private consumption and 0.5 for gross formation of capital.

Thus, the impact of a decrease in the foreign currency generated by sportfishing has simultaneous effects of greater decrease in private consumption than on investment in the economy and on the value added of the hotel, business and restaurant sector.

Table 26. Estimation of the Simultaneous Equations Model

Simultaneous Equation System
Estimation Method: Ordinary Square Minimums
Data Range 1991:01 to 2008:04
71 Observations

	Coefficients	Prob.
C(1)	9.076099	0
C(2)	0.215858	0
C(3)	0.34621	0
C(4)	0.699585	0
C(5)	1.324151	0.0139
C(6)	-0.181017	0
C(7)	0.47081	0
C(8)	0.501457	0
C(9)	-3.182327	0
C(10)	0.733276	0
C(11)	0.261807	0
C(12)	0.156873	0

Equation 1: LOG(PIB) = C(1) + C(2)*LOG(M1(-1)) + C(3)*LOG(FBKF(-3)) + C(4)*LOG(TC(-1))

R-Square	0.997197
R-Adjusted	0.997067

Equation: LOG(FBKF) = C(5) + C(6)*LOG(I(-1)) + C(7)*LOG(CRH) + C(8)*LOG(FBKF(-2))

R-Square	0.993572
R-Adjusted	0.99328

Equation: LOG(CO) = C(9) + C(10)*LOG(CO(-1)) + C(11)*LOG(CRH(-2)) +C(12)*D4

R-Square	0.99783
R-Adjusted	0.997731

Source: IICE with results and outputs obtained from the Eview Econometric Package

Quantification of these effects in the general balance macro-econometric model equations is done in two ways: analyzing the effect of excluding sportfishing on consumption and investment –and thereby estimating its effects on the GDP, versus not excluding this effect on national consumption and investment variables.

Table 27 shows the effects of sportfishing on GDP. The comparison is done by omission, i.e., it answers the question of what would happen in the economy if anglers did not generate value-added. When analyzing the estimation with and without sportfishing, both for consumption as well as investment, an important net effect can be observed of nearly -4.1%. This result means if there was no investment by sportfishing, GDP would have decreased by US$279 million in 2008. This decrease is the result of the marginal propensity to invest and the coefficients of elasticity of investment in that sector, described above.

The greatest effect occurs in national consumption, which would be reduced by 5.76%, or approximately US$1.130 billion, if anglers did not inject dollars into the

Costa Rican economy. The explanation for this coefficient is the marginal propensity for private consumption and, in particular, the consumption of this type of good. The simultaneous effect on the GDP is a reduction of approximately 2.13%, or US$599 million. We should remember that this effect originates from the actions by small companies and families' marginal propensity to invest and consume for every additional dollar received.

Table 27. Impact on Gross Domestic Product and Taxes of Reduction in Consumption and Investment from Sportfishing in 2008
(Thousands of Current Dollars)

Sportfishing	With Angler Expend.	Without Angler Expend.	Absolute Change	Percent. Change
Gross Domestic Product	28,141,491	27,542,387	-599,104	-2.13%
Gross Formation of Fixed Capital	6,813,218	6,533,581	-279,637	-4.10%
Consumption	19,619,453	18,488,495	-1,130,959	-5.76%
Taxes (13% burden)			-77,884	

Source: IICE with Econometric Model Results

Considering that the tax burden in relation to GDP has historically been about 13%, the result would be that government tax revenues would be reduced by approximately US$77.8 million if anglers dollars were to disappear.

7.5 Analysis of the impact on employment by sportfishing

The same as in the previous case, to estimate the employment impact that sportfishing may have on the national economy, a methodology of total productivity of factors was used. This approach assumes that to produce one unit of product, so many units of work, capital and other productive factors are needed, based on a fixed level of technology (state of the art) in the economy. This relation of total productivity of factors for Costa Rica has been developed, among other by Esquivel and Rojas (2007).

It is assumed that economic production follows a neoclassic Cobb-Douglas function $Y=AK^{\alpha}L^{(1-\alpha)}$, where Y is the level of real national production, K is the total sum of capital, L represents the work input and A represents the total level of productivity of the factors. By applying logarithms and time derivations, the following expression is obtained: $y=a+\alpha k+(1-\alpha)l$. Here, "y" is the national production growth rate, "α" is the residue of change in total productivity of the factors, "l" is the employment growth rate and "k" is total capital growth rate. Components α and (1-α) represent, respectively, the share of capital and of labor in the total product

Total production growth is obtained by simulating the impact of sportfishing on economic growth in 2007-2008, which is approximately 2,1% in nominal terms. This impact corresponds specifically to the aggregated effect of reducing the expenditure of over US$500 million by US and Canadian anglers visiting the country to fish in 2008. It has to be stressed that this impact on the reduction of expenditures is centered on Hotels, Restaurants and Business, which are components with a high multiplier effect in the national economy.

The sum of all factors must be equal to one unit when the production function has constant returns of scale. Esquivel and Rojas (2007) estimated this equation for Costa Rica in 1991-2006, and found that α=0.35. It means that the share of capital in the total product is 0.35 and that of labor is 0.75. Therefore, if :l=(y-a-αk)/(1-α) and one assumes this growth occurs without an increase in capital (i.e., all change is due to increased employment) and at the same time a simulation with and without sportfishing -"ceteris paribus"- does not have an effect on total productivity of the factors, the result would be that employment would grow by approximately 3.23% (i.e., l=(0,21)/(1-0.35)= 3,23%). This effect in general is on the employment factor, without taking into account the various types or quality of employment.

This result reports the decrease of the Gross Domestic Product, both on the side of demand (consumption equation) as well as supply (gross formation of fixed capital), of not receiving the amount of foreign currency entering the country from expenditures of Canadian and US anglers coming to Costa Rica for the purpose of sportfishing. In addition, the result will depend on the effect on the total productivity of the factors. In other words, in the two scenarios, one with sportfishing and the other without, we obtain a difference of 2.1% in nominal growth. Under the assumptions mentioned above, it could be inferred that to maintain jobs levels now existing with anglers bringing dollars into the economy, under a scenario without angler expenditures entering the country, other economic sectors would need to produce 3.23% more employment to compensate for the loss. This is equivalent to about 63,000 workers, as the labor force in 2008 was over 1.9 million workers.

Chapter 8

Comparison of the Economic Contribution of Commercial Fisheries and Sportfishing of Billfish to the Economy

Upon comparison of the results obtained using the econometric model for sportfishing and commercial fisheries, it can be seen that the impact of sportfishing on Gross Domestic Product, investment, taxes and employment is higher than for commercial fisheries.

This is mainly due to the fact that each Colon that enters the business sector, restaurants or hotels, has a greater capacity for multiplying and impacting economic activities more than the agricultural and fisheries sector. This is a response to the finding that the marginal propensity to consume is higher than the marginal propensity to invest in both activities, but the effects are larger in one of these.

In addition, the sportfishing simulation is based on analyzing the impact a decrease in the income generated by US and Canadian anglers would have on consumption and investment, taking into account that a large portion of the income (30%) of these companies is reinvested (according to the Business Survey carried on by IICE during 2009) in their own business. This rate is higher than the rate between investment and the income generated by commercial fishing for the selected species, which is 24%. This investment rate in sportfishing improves business competitiveness and guaranteeing even larger impacts to national economic growth. In order to point out that one activity would generate much more aggregate production value than the other, we need to have econometric estimations in a complete economic model which compares how much a dollar is used in both sectors.

The impact of sport and commercial fisheries on the national economy was estimated using econometric techniques, based on data from those sectors obtained from primary and secondary sources as previously described. Table 28 summarizes the results obtained from the model using various assumptions and scenarios. The effects are interpreted in the sense of what would have happened in the national economy in 2008 in the absence of commercial or sportfishing for the specified species. For comparison purposes, the illustration can be interpreted in a positive sense by inferring what the contribution is of these activities to the national production on variables such as supply, demand and taxes:

- The effect of sportfishing on GDP was approximately US$599.1 million (2.13% of the GDP for 2008), while commercial fishing contributed US$527.8 million (1.88% of the GDP). In other words, sportfishing contributed about US$70 million more than commercial fishing for the same species, equivalent to 0.25 percentage points of contribution to the GDP.
- It should be noted that the above effects cannot be aggregated; i.e., they cannot be added together to obtain a combined effect from commercial and sportfishing on the GDP, as the estimates were obtaining by eliminating only one of the activities at a time.

- For investment (gross capital formation), it was estimated that sportfishing contributed US$279 million, while commercial fishing contributed US$16.6 million for the year. The explanation is that while anglers are willing to spend thousands of dollars to catch a fish, commercial fishermen try to use the most cost-efficient methods.
- Taking the overall average tax burden for Costa Rica of 13% (without any analysis of the effect of subsidies, evasion and other aspects), it was estimated sportfishing generated US$77.8 million for the country, while commercial fisheries contributed US$68.6 million.

Table 28. Impact over the Gross Domestic Product of Reducing Consumption and Investment in Sports and Commercial Fishing of Selected Species for 2008 (thousands of current dollars)

Commercial Fishing	W/comm. fishing	W/O comm. fishing	Absolute change	Percent change
Gross Domestic Product	$28,141,491	$27,613,656	-$527,835	-1.88%
Gross Capital Formation	$6,813,218	$6,796,615	-$16,603	-0.24%
Consumption	$19,619.453	$18,476,031	-$1.143,422	-5.83%
Taxes (13% rate)			-$68,619	
Sportfishing	**W/ tourist expenditures**	**W/O tourist expenditures**	**Absolute expenditures**	**Percent change**
Gross Domestic Product	$28,141,491	$27,542,387	-$599,104	-2.13%
Gross Capital Formation	$6,813,218	$6,533,581	-$279,637	-4.10%
Consumption	$19,619,453	$18,488,495	-$1,130,959	-5.76%
Taxes (13% rate)			-$77,884	

Source: IICE with econometric model results

Chapters 6 and 7 of this document illustrated the effect on employment reduction; or if interpreted in a positive sense, how many jobs would be required to increase GDP by 1.88% given the effect of commercial fisheries of billfishes or how many jobs would be required to increase GDP by 2.13% to match the effects of sportfishing. These effects were estimated using total productivity of the factors, assuming a natural employment rate among the economically active population and a function of scaled constant yield production. Sportfishing contributes 63,000 jobs and commercial fisheries for the same species provides 57,000 total jobs.

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Taller de indicadores socioeconómicos del sector pesquero y acuícola centroamericanos 2009, Costa Rica.

Appendices

Appendix 1

List of Selected Species

Several species captured by commercial as well as sports fishing have been selected for the commercial fisheries study. It should be noted that the list of species captured in sportfishing is longer. The selected species were:

a) Mahi-mahi (Coryphaena hippurus): Found in the Pacific, Atlantic and Indian Oceans. Mean length is 6 cm (TL) although individuals may be as large as 180 cm (TL). They feed on fish, crustaceans and mollusks. It reproduces in the high seas. Can be fished all year, more frequent November through February.

b) Blue Marlin, known in Costa Rica as White Marlin (Makaira mazara): Found in the Eastern Pacific Ocean. Common length is 400 cm (TL) but some individuals may grow up to 430 cm (TL). Feeds on cephalopods and crustaceans. Fishing season is year-round, mainly in the second semester (July through December).

c) Striped Marlin known in Costa Rica as Pink Marlin (Tetrapturus audaz). Found in the Eastern Pacific Ocean. Common length is 300 cm (TL) but may grow up to 340 cm (TL). Feeds on cephalopods and crustaceans. Fishing season is year-round, mainly in the second semester (July through December).

d) Swordfish (Xiphias gladius): Lives in tropical and temperate waters, oceanic epipelagic, although it is also found in coastal waters. Very aggressive fish. Mean length is 280 cm (TL). Feeds on cephalopods and crustaceans. Fishing season is year-round during the full moon.

e) Wahoo (Acanthocybium solandri): Found in oceanic waters and areas near rock formations faraway from the coast. Mean length is 130 cm (OL), although some individuals may reach 210 cm (OL). Feeds on small pelagic fish and squid. Fishing season is year-round, mainly in the second semester.

f) Tuna (Thunnus spp.): Swims at cruising speed of 3-7 km/h, but may reach 70 km/h and, exceptionally, is capable of reaching 110 km/h for short distances. Travels great distances during migrations (14 to 50 km per day), for up to 60 days.

Appendix 2

IICE Macro-Econometric Model[13]

I. Introduction

Economics, as a science, is based on observations made. Thus there is an interest in testing various theories to determine the most adequate relations. It is assumed that the most important aspect in rational debate is that the different positions be open to criticism, so that it and the evidence can become the motor of progress, eliminating false theories from consideration and leaving only the best provisional theories.

Based on this, the scientific attitude would lead us to establish a constant search of counter-examples that may show the falsehood of our theories in order to detect errors in them and thus make progress in the search for the truth. In addition, if we assume that human beings through rationality can (only) approximate this truth, in other words, can advance in its understanding of reality but can never absolutely demonstrate a theory, we would realize that human knowledge is, above all, based on conjectures and it is through trial and error that we can gradually get closer to understanding reality.

If we believe the above, it is necessary to compare the theory and the observations to determine the behavior of an economy. That is, together with the theoretical proposals it is necessary to estimate the relations proposed at the empirical level for the purpose of evaluating them and thereby reject some proposals and set forth new hypotheses. For this reason, a proposal is made not to abandon the empirical work that has been carried out at macro-economic level, in order to continue increasing the knowledge acquired of the most relevant macro-economic relations in Costa Rica.

The model used is an update of an earlier one developed by Saborío (2004). Once that model had been updated, several modifications were proposed and the results compared. Among the main modifications we should highlight the elimination of the dichotomous variables of the model and replacement by a more dynamic specification. But the result obtained is that the model adjustment falls within the sample. At the same time, a new equation is incorporated for the interest rate as well as an equation for prices that takes supply considerations into account. Specifically, the price of labor (salaries) and the price of oil. Finally, we begin with the development of a VAR model with the different variables used in the second model.

The first two structural models support relations presented by the economic theory, such as dependency of consumption on available income, the relation between net exports and internal prices, as well as the relation of the available currency with interest rates and production level.

[13] Taken from Rojas, Luis (2005).

II. Theoretical Relations, New Specification of the Structural Model and Estimation

II.1 Theoretical Model

There are 3 agents of the economy we will call: Families, Businesses and Government. In this section we will discuss the first of these agents.

It is assumed the profit function of families, in the period *t*, depends on consumption, the amount of real balances and idleness.

(1) $U_t = u_t(C_t, \frac{M_t}{P_t}, \bar{L} - L_t)$

where $\bar{L}$ is total available hours in the period and $C_t = F(C_t^N, C_t^*)$ is an index of real consumption comprised by consumption of national and imported goods.

In addition, P_t is a price index defined as minimum possible expenditure to obtain a unit of C_t.

The family maximizes the following target function:

(2) $UT = g(u_1, u_2, ..., u_N)$

where 1 refers to the present period and N to a final period. In addition, we will assume the existence of a single financial asset we will call B. Thus, B are the net tendencies of this asset by the agent.

Income before taxes would be:

(3) $Y = WL + iB$

We will assume an individual is charged T in taxes and is given transfers for TR. Thus, savings by families can be expressed as:

(4) $S = Y - T + TR - PC$

Family budget restrictions can be represented as:

(5) $S - \Delta B - \Delta M = 0$

The restriction proposes that savings are reflected either in the collection of bonds by the families or their cash holdings.

The decision variables for families would be: consumption C, cash and asset holdings, M and B, and hours of work rendered L. The exogenous variables for the family would be: taxes T, transfers TR, salary W and prices P.

If the future values of the exogenous variables are unknown by the families, expectations about these values should be built before solving the problem of optimization. It is assumed that the agent builds the expectations under a limited set of information. The agents do not know the complete model and therefore their expectations differ from model predictions. In addition, the expectations are treated with certainty by the agents. In other words, the agents are unaware of the fact that their expectations are uncertain when they solve their maximization problems.

Stochastic variables for individuals are replaced with their expected values before solving the optimization problem.

In addition, we have two initial conditions, for assets B and for cash trends M, together with a final condition that is assumed to be exogenous.

$$B_{FN+1} + M_{FN} = \overline{BM}$$

Solving the Problem of Maximization for Families:

In order to solve the problem of maximization for families, first we are going to assume that the target function is inseparable in each period but, specifically, we are going to assume that:

$$UT = \sum_{s=0}^{N} \beta^s u\left(C_s, \frac{M_s}{P_s}, \bar{L} - L_s\right)$$

Using (3), (4) and (5), budget restriction can be expressed as:

$$B_{t+1} + M_t = (1+i)B_t + M_{t-1} + W_t L_t - P_t C_t - T_t + TR_t$$

If we maximize UT subject to the previous restriction we have that:

B_{t+1}:

(6) $$u_{Ct} = \frac{p_t}{p_{t+1}}(1+i)\beta u_{ct+1}$$

C^*_t:

(7) $$u_{Ct*} = \frac{p_t}{E_t p^*_t} u_{Ct^N}$$

M_t:

(8) $$\frac{u_{ct}}{p_t} = \frac{u_{M/P}}{p_t} + \beta \frac{u_{Ct+1}}{p_{t+1}}$$

and using (6) we can reformulate the above equation as:

(9) $$u_{M/P} = \left(\frac{i}{1+i}\right) u_{ct}$$

L_t:

(10) $$u_{\bar{L}-Lt} = \frac{p}{W} u_{ct}$$

In addition to these conditions of first order, families take into account the initial and well as final conditions of the problem. There are different ways to take these conditions into account in order to solve the problem.

By dividing on both ends of the restriction from p_t, solving $(1+i_t)B_t/p_t$, iterating the restriction and substituting B_{t+1} in each iteration we find that:

$$\frac{(1+i_0)B_0}{p_0} + \frac{M_{-1}}{p_0} = \sum_{s=1}^{N}\left(\frac{1}{(1+r)}\right)^{s-1}\{C_s + A_s\} + \sum_{s=1}^{N-1}\left(\frac{1}{1+r}\right)^{s-1}\left\{\frac{i}{1+i}\frac{M_s}{p_s}\right\} + \left(\frac{1}{1+r}\right)^{N}\left\{\frac{M_N}{p_N} + \frac{B_{N+1}}{p_N}\right\}$$

where $A_t = T_s - TR_s - W_s L_s$ and in addition it is assumed that:

$$\frac{1}{1+r} = \frac{p_{t+1}}{p_t(1+i_{t+1})} = \frac{p_{t+2}}{p_{t+1}(1+i_{t+2})} = ...$$

We will call $\frac{(1+i_0)B_0}{p_0} + \frac{M_{-1}}{p_0} = BM_0$ the initial condition of assets and if we select β in such a way that consumption C_t is kept constant, we could solve the above restriction so that:

$$C = \left(\frac{1}{1-(1+r)^{-N-1}}\right)\left(\frac{r}{1+r}\right)\left\{BM_0 - \sum_{s=1}^{N}\left(\frac{1}{(1+r)}\right)^{s-1}\{A_s\} - \sum_{s=1}^{N-1}\left(\frac{1}{1+r}\right)^{s-1}\left\{\frac{i}{1+i}\frac{M_s}{p_s}\right\} - \left(\frac{1}{1+r}\right)^{N}\frac{\overline{BM}}{p_N}\right\}$$

Alter the conditions of first order (7), (9) and (10), we have that the amount consumed of the imported good depends on the real exchange rate, while cash holdings depend on the interest rate and while the amount of work rendered in a function of real salary. If we substitute these relations in the condition derived above, for consumption we would have that: consumption is a function of expected real interest rates, expected taxes, expected transfers and income.

On the other hand, demand for cash depends on consumption (or income) and interest rates. Work supply depends on real salary and consumption, while consumption of the imported good depends on real exchange rate and consumption (or income) if we use $C_t^N = F^{-1}(C_t, C_t^*)$

Businesses

We are going to assume that the target for businesses is to maximize the discounted value of heir benefits. In addition we assume that there is a cost for adjustment or installation of capital. Following Obstfeld and Rogoff (1998), it is assumed that for changing the collection of capital in the amount $K_{t+1} - K_t = I_t$, between t and t+1, businesses have to incur in a hidden cost for installation of capital equal to $\frac{\chi I_t^2}{2K_t}$ over the cost of acquisition of capital I_t. Thus, the net production value of the cost of capital adjustment or installation would be:

$$PG(L,K) - P\frac{\chi I^2}{2K}$$

where G(L,K) represents the production function of the business. With this the business maximizes the discounted value of the benefits (taking into account the capital installation cost) subject to $I_t = K_{t+1} - K_t$. The corresponding Lagrangian would be:

$$\ell_t = \sum_{s=t}^{N}\left(\frac{1}{1+i}\right)^{s-t}\left\{P_s G(K_s, L_s) - P_s\frac{\chi I_s^2}{2K_s} - W_s L_s - P_s I_s - q_s P_s(K_{s+1} - K_s - I_s)\right\}$$

where q_s is the shadow price of capital, which in this case is equivalent to "Tobin's q". From the condition of first order of the above problem regarding level of work we obtain:

(11) $$G_L(K_t, L_t) = \frac{W_t}{P_t}$$

From the condition of first order regarding investment we obtain:

(12) $$I_t = (q_t - 1)K_t / \chi$$

and regarding K_{s+1} we obtain:

(13) $$q_t = \frac{P_{t+1}G_K(L_{t+1}, K_{t+1}) + \frac{\chi}{2}\left(\frac{I_{t+1}}{K_{t+1}}\right)^2 + q_{t+1}}{(1+r)}$$

By iterating this equation we obtain:

(14) $$q_t = \sum_{s=t+1}^{N}\left(\frac{1}{1+r}\right)^{s-t}\left[P_{t+1}G_K(L_{t+1}, K_{t+1}) + \frac{\chi}{2}(I_{t+1}/K_{t+1})^2\right] + \left(\frac{1}{1+r}\right)^N q_{t+N}$$

If we assume that the production function presents constant yields at scale, we could easily express the value of the marginal product of capital in equation (14) as a function of the product level. With this and substituting (14) in (12) we have that investment depends (mainly) on the future values of the product, the same future investment, the expected collection of capital and the interest rates.

Government

The government collects taxes and issues transfers to families and at the same time spends G in goods and services. On the other hand, Banco Central (BC) establishes the exchange rate.

When establishing the exchange rate, BC experiences variations in international monetary reserves RMI and through these, in the amount of cash.

What do RMI variations depend on? We know that a change in RMI is equal to the sum of the result in the current account and the capital and financial account. From the solution for families we see that imports or purchases of an external good depend on the real exchange rate, real interest rate, income and the expected values of these variables. If we assume that families in the rest of the world behave in a similar manner, exports would depend on the same but external variables. That is to say, they will depend on external income, real interest rate and real exchange rate. The families in the model, when deciding on consumption and the real balances they wish to have, are at the same time deciding on the amount of bonds they want for a given amount of income. Thus, the bonds will again depend on the same variables. In the problem for families, only one bond B is used. It is assumed that all internal as well as external assets are perfect substitutes for each other. Based on this, and assuming the information is perfect (and that no costs exist for transferring from an external to a national asset), arbitrage would ensure interest rate parity with external rates.

In the econometric specification, we are not going to assume this occurs, so that reserves will not only depend on the internal interest rate, but also on the difference

between internal and external rates and this difference does not have to match devaluation.

Therefore, the reserves would depend on internal as well as external income, real exchange rate and exchange rate difference. Reserves would determine monetary supply or we could say that monetary supply depends on the variables mentioned above for RMI.

But, at the same time, BC can sterilize the entry of monetary reserves. We are going to assume that BC uses this instrument to soften the amount of money in the economy, in such a way that monetary supply in turn will depend on past values.

In summary, we could say that:

$$RMI_t = F(i - i^*, yd, yd^*, e, \text{valores esperados de estas variables})$$

$$M^s = F(M_{-1}, RMI)$$

we could substitute the first of these two equations in the second and solve the interest rate in such a way that the interest rate depends on the variables mentioned and on M^s. But assuming a balance in this market M^s would be equal to the demand for money of families and with these two equations we would endogenously determine both the amount of money as well as the national interest rate.

II.2 Econometric Model

Consumption in the theoretical model depends both on the expected real interest rate as well as the expected available income. In addition, as mentioned before, we assume that the agents build their expectations before solving their optimization problems and consider these expectations as certain when solving the problem. In general, we could use many forms for these expectations. The three most common forms to treat them include a representation where expectations are simply realized with past values of the same variables. Another way to work these expectations is as rational expectations, where the agents "know the whole model" and use it to estimate future expected values. Therefore they use all the information available to form their expectations. A third option is an intermediate case, where expectations are built by calculating the expected values of the variables in a given set of information or variables, the difference with the rational expectations is that this set normally does not include all the variables in the model.

In this document we are mainly going to use the first assumption for building the expectations, i.e., we are going to assume that when agents are building their expectations for a variable they will simply include past values for it.

On the other hand, different from the Saborío model (2004), this second specification is estimated using 3-stage least squares, where all exogenous variables are the instruments[14]. Appendix 2 justifies this choice in more detail. In addition, the period used is the same as in the previous model, from the third quarter of 1992 to the third quarter of 2004.

[14] Specifically, the instruments used are: C PIB(-1) GT(-1) IG(-1) GT IG D4 I(-1) FBK(-1) INA(-1) D1 D36 D56 DEV INE PIBE M(-1) PP M1C(-1) IPC(-1) IE W W(-1)

This model is simplified by only estimating total exports, rather than estimating exports of goods as well as services. In addition, international monetary reserves are not estimated and therefore the model only includes 7 equations related to behavior that are solved simultaneously. The equations estimated are presented below.

E1: Consumption

According to the model, consumption depends on the real interest rate and the expected values of available income. The specification takes into account available income and delayed available income, but nominal rather than real interest. The real interest rate was not significant in various specifications and the same happened when using inflation only.

Regarding available income, there is a positive relation between it and consumption, while there is an inverse relation with interest rate. In addition, a dichotomous variable was included for the last quarter of the year. The estimated parameter for this variable shows increased consumption in the last quarter of each year.

LOG(CO)=A(1)*LOG(INDISP(-1))+A(2)+A(3)*LOG(INDISP)+A(4)*D4+A(5)*I(-1)+[AR(4)=A(6)]

E2: Gross Formation of Capital

Investment in this model depends on production, real interest rate and delayed gross formation of capital itself. It should be noted that this variable has an inverse dependency with the interest rate. This is an important difference (at least conceptually) with the previous model, where FBK depended on the *external* interest rate. In this case, real interest rate is described as the difference between the annual passive rate and the annual change in IPC (consumer price index). There is also a direct relation with production. But in this equation we do not discard the existence of an auto-correlation since it does not pass the test of the proposal.

On the other hand, it should be noted that this is the variable with less adjustment. This point will be discussed further later.

FBK=B(1)*FBK(-1)+B(2)*PIB(-1)+B(3)*(I(-1)-INA(-1))+B(4)*D1+B(5)*D36+B(6)*D56+[AR(1)=B(7)]

E:3 Exports

Exports, different from the previous model, are exports in millions of 1991 Colones and depend on the real exchange rate, described as the nominal exchange rate plus the difference between the variation in external and internal prices. There is a direct relation between these two variables.

In addition, there is a direct relation with external income described in relation to the GDP of the United States. As could be expected, there is direct (and significant) relation both with the variation in real exchange rate and external income.

On the other hand, given the specification of the theoretical model, real interest rate is incorporated as an explanatory variable. There is a direct relation between exports and real interest rate.

LOG(X)=S(1)+S(2)*(DEV+INE-IN)+S(3)*LOG(PIBE)+S(4)*(I(-1)-INA(-1))+[AR(1)=S(5)]

E4: Imports

Imports depend on the relation of external and internal prices, available income, real interest rate and oil prices. It should be noted that according to the theoretical model, this variable also depends on the exchange rate, but in different estimates this was not significant if included together with real interest rate.

As could be expected, imports show an inverse relation with the external price and a direct relation with available income. In addition, the data show an inverse relation with international crude prices as well as real interest rate.

LOG(M)=F(1)*LOG(IPCE/IPC)+F(2)*LOG(INDISP)+F(3)*LOG(M(-1))+F(4)*(I(-1)-INA(-1))+F(5)*LOG(PP)

E5: Circulation Medium

The equation for circulation medium in millions of Colones depends on the circulation medium for the previous quarter (sterilization), consumption level, interest rate and internal prices.

As could be expected, the circulation medium has a direct relation with the level of consumption and prices, and an inverse relation with the interest rate.

LOG(M1C)=H(1)*LOG(M1C(-1))+H(2)*LOG(CO)+H(3)*I+H(4) *LOG(IPC)

E6: Interest Rate

We have an additional equation that limits interest rate due to devaluation, international interest rates, income (measured by GDP) and real amount of money. As could be expected, there is a positive relation between domestic interest rate and devaluation and the external interest rate, while there is an inverse relation with income and direct relation of the real amount of money (both delayed).

I=E(1)+E(2)*(M1C(-1)/IPC(-1))+E(3)*DEV+E(4)*PIB(-1)+E(5)*IE+E(6)*I(-1)+[AR(2)=E(7)]

E7: Prices

Finally, there is an equation for prices. From using supply and demand for work derived from the theoretical model, a relation could be expressed between salary and number of hours worked. The problem is that the number of hours worked would be an endogenous variable in the model and there are no quarterly employment data. Therefore we could use the production function and labor market equations, to derive a relation between production level, salary and internal prices. In the end, this is the equation estimated.

Thus, prices depend on salaries and oil prices, in addition to production. There is a direct relation between general price level and minimum salary index. In addition, there is a direct relation with production level and international crude prices. But in this equation we do not discard the existence of auto-correlation since it does not pass the proposed test.

IPC=V(1)*PP+V(2)*W+V(3)*PIB+[AR(2)=V(4)]

Identities

The model, in turn, includes 5 identities. The first refers to GDP as the sum of consumption, FBK, government expenditure and net exports. The second defines available income as GDP minus government income plus transfer expenses. The third calculates the exchange rate based on quarterly devaluation and the last two calculate percentage change in quarterly as well as inter-annual prices.

PIB = CO + FBK + G + X - M

INDISP = PIB - IG + GT

TC = TC(-1) * (1 + DEV / 100)

IN = (IPC - IPC(-1)) * 100 / IPC(-1)

INA = (IPC - IPC(-4)) * 100 / IPC(-4)

Some Model Characteristics

Leaving aside all dynamic considerations, this model (for observation) follows logic similar to the IS-LM model. The main relation is represented by the following functions:

1) PIB = F(I(-1), IPC)
2) M1C= F(Co(PIB,I(-1)),I,IPC)
3) I=F(M1C(-1)/IPC(-1))
4) IPC=F(PIB)

Equations E1 through E4 together with the definition of aggregated demand turn GSP into a function of delayed interest rate, prices and exchange rate, although exchange rate is exogenous.

For a given price level, there is an inverse relation between the product and delayed interest rate and this is due to the negative relations between FBK and consumption of the interest rate, reflected in the signs of coefficients B(3) and A(5).

On the other hand, equations E5 and E6 determine the interest rate and the circulation medium for given levels of product and prices. Equation E5 presents a "demand for money"[15]. But at the same time we could expect, as mentioned above, that in a small and open economy with an exchange rate determined by the monetary authority, the amount of money would also depend on RMI. Therefore, this variable was incorporated into the demand, but the estimated parameter did not turn out to be significant.

It is assumed that this relation breaks because the monetary authority, in order to control prices, tends to sterilize increases in the circulation medium from strong

[15] In reality what is estimated is an equation for the various "points of equilibrium" observed.

entries of capital. That is why we included delayed circulation medium in the equation, to attempt to replicate a policy aimed at softening changes in the amount of money in the economy.

On the other hand, since this is an open economy, it should be expected that interest rate is related to external interest rates and devaluation, through interest parity. Equation E6 shows the dependency of interest rates on devaluation and although the external interest rate was included, the parameter was not significant. On the other hand, since mobility of capitals is not expected to be perfect, interest rates would also be determined by monetary supply, a variable that is also included in equation E6.

We can see the interest rate is established by past values of the other endogenous values.

5) PIB = F(I(-1), IPC)
6) M1C= F(Co(PIB,I(-1)),I,IPC)
7) IPC=F(PIB)

Thus, changes in the circulation medium today has no effect over the product and *current* prices. The relation between these variables is *dynamic*. Exogenous changes in the circulation medium today affect interest rates tomorrow and changes in tomorrow's interest rate affect the product the day alter tomorrow. Therefore, in this model, exogenous variations in the exogenous medium will have effects on products and prices one semester later.

On the other hand, an exogenous increase in interest rates today will also have effects over prices and products tomorrow. An increase in interest rate today, for example, caused by increased devaluation, will affect FBK, consumption, imports and exports tomorrow. The first three will be reduced and exports will increase. The final result will be a decrease in the product.

But at the same time it affects the circulation medium today and therefore will have effects over prices and products two periods ahead. When interest rates increase, the circulation medium diminishes today and thus affects the interest rate tomorrow.

First the circulation medium decreases in dM1C/di=H(3)*M1C. Then the interest rate tomorrow would change in di/di(-1)=E(2)*H(3)*M1C(-1)/IPC(-1) + E(6). The first term in this relation prevails, thus diminishing interest rate tomorrow and this decrease in tomorrow's interest rate increases the product the day after tomorrow. With this the model generates cycles wherein a change in today's interest rates leads to changes in tomorrow's products, but at the same time to an inverse variation of the product the day after tomorrow.

Going back to today's prices and products we can see these are determined by equations 11) and 13) above.

Equation 13) shows a direct relation between prices and product, while relation 11) shows an inverse relation. When internal prices increase, exports decrease and imports increase, which leads to a reduction in aggregated demand. In addition, increased price is associated to changes in M1C tomorrow and this causes changes in the interest rates and changes in the product two periods ahead, as described previously.

Relation 15) shows a direct relation between prices and product reflected in coefficient V(3) of equation E6.

The same as in the previous model, the convergence will depend on the initial values of the prices, the product and, in this case, the interest rate.

III. Model Adjustment

Deterministic and Stochastic Simulation

The models were solved using the Gauss-Seidel techniques. According to Fair (1984) we can write an example to illustrate the operation of this technique. We assume that the model consists of only 3 equations. These equations in Fair (1984) can be represented as follows:

16) $f_1(y_{1t}, y_{2t}, y_{3t}, x_{1t}, \alpha_1) = \mu_{1t}$

17) $f_2(y_{1t}, y_{2t}, y_{3t}, x_{2t}, \alpha_2) = \mu_{2t}$

18) $f_3(y_{1t}, y_{2t}, y_{3t}, x_{3t}, \alpha_3) = \mu_{3t}$

Where x_{it} is a set of predetermined or exogenous variables, α_i represents the parameters estimated in equation i and μ_{it} represents the errors of equation i.

To resolve the model what we can do is to "solve" each one of the endogenous variables as a function of the other endogenous variables, their respective exogenous variables, their parameters and errors. Thus, this model can be represented as:

19) $y_{1t} = g_1(y_{2t}, y_{3t}, x_{1t}, \alpha_1, \mu_{1t})$

20) $y_{2t} = g_2(y_{1t}, y_{3t}, x_{2t}, \alpha_2, \mu_{2t})$

21) $y_{3t} = g_1(y_{1t}, y_{2t}, x_{3t}, \alpha_3, \mu_{3t})$

To resolve the model we need the values of the parameters and errors. Let's assume these values are known. Once we know the errors, parameters and given the values of the exogenous variables, the way to resolve the system is as follows. First we take the initial value for each one of the endogenous variables, normally the observed or estimated value for the previous period. Thus, the initial value selected for the endogenous variables y_2 and y_3 is substituted in the first equation 19) in this example. We find a value for y_{1t} by substituting these values. We use this new value for the first endogenous variable and the initial value for y_3 in equation 20) and obtain a new value for y_2. With the values found for y_1 and y_2 (by substitution in 19) and 20)) we can substitute in the last equation of the system 21) and find a value for y_3. Once we have the values for the 3 endogenous variables, we can again substitute in the first equation and find a new value for y_1 and with it find a new value for y_2 and use these two new values to find a new value for y_3. This procedure can be repeated until a final condition is imposed. In our case two conditions were used; the first was to impose a maximum of 5000 repetitions in the run and the second was that it would end if the process converged. In case the process converged, the definition was that the percentage change for each endogenous variable should be less (in absolute value) than 1e-08. In addition, in our case all models used were stopped for the second reason, i.e., they converged.

As mentioned above, in order to resolve the model in this way, it is necessary to know the values of the parameters and errors in each equation. If in the process of resolving the system a sole set is used for the errors and one for the parameters, it is said that the simulation is deterministic. Different from this, a simulation is stochastic if several sets of values for errors (and parameters) are chosen and used to resolve the model.

For the second model we used both the deterministic as well as the stochastic simulation. In the deterministic solution, a zero error was used (the expected value) and the estimated parameters.

For the stochastic solution several sets of values were used only for the errors but not for the parameters, which were always maintained at their estimated value.

For the selection of errors to be used in the stochastic simulation, first you have to assume these have some sort of distribution and in this case we assumed the distribution is normal. In other words, it is assumed that $u_t = (u_{1t},...,\mu_{mt})'$ is independent and identically distributed as a multivariate N (0,S).

Now, let's suppose that u_t^* is a selection of the m errors. Using these errors we can resolve the model as if it were deterministic, except that it uses selected errors rather than assuming zero values. If we call this a "test", we could continue to select errors and continue running "tests". For each test run, you would obtain a set of values for the endogenous variables that is resolved for each moment of the proposed period.

Thus, for each moment *t,* you can calculate the mean and the variance for each of the endogenous variables. The way to select the different errors is as follows. First you break down the variance-covariance matrix $\hat{S}$ in PP´, and the selected errors would be *Pe,* where *e* is a vector m x 1 of numbers selected from a standard normal distribution. It can be demonstrated that errors selected in this way have a var-covar matrix equal to that of estimated errors $\hat{S}$.

In our case we use 1000 repetitions for errors when the stochastic simulation was used. In the stochastic simulation the variable used is the mean of the observations simulated for each endogenous variable.

The formulas used to calculate these errors are:

- Percentage Error: $$epc = \sqrt{\frac{1}{T}\sum_{t=1}^{t}\left(\frac{\hat{Y}_t - Y_t}{Y_t}\right)^2}$$
- Absolute Percentage Error: $$eap = \frac{1}{T}\sum_{t=1}^{t}\left|\frac{\hat{Y}_t - Y_t}{Y_t}\right|$$

Start of a Vector Autoregressive Model

The structural models presented above impose a dependency among the variables, based on some relations developed by the theory. The idea in this section is to develop a vector autoregressive model (VAR), which has the characteristic that all endogenous variables depend on all and on the selected delays. In addition, all

equations include all selected exogenous variables, in other words, no “zeroes” are imposed on any possible parameters.

For this model, the endogenous variables selected were the 7 presented in the second model: consumption, gross formation of capital, exports, imports, circulation medium, interest rate and consumer price index. Eight exogenous variables were included. These variables are: available income, devaluation, United States consumer price index, United States GDP, oil prices, nominal minimum salary index and two dichotomous variables, one for the first semester of each year and the other for the last semester of each year. In addition, the logarithm for each one of these variables was used, rather than using them without any transformation, except for interest rate and devaluation.

IV. Description of Variables

Description of each variable and how it was obtained				
Acronym	**Name**		**Transformation**	**Source**
PIB	Gross Domestic Product	Millions of 1991 Colones	3 month average	BCCR
CO	Private Consumption	Millions of 1991 Colones	3 month average	BCCR
G	Government Consumption	Millions of 1991 Colones	3 month average	BCCR
IK	Capital Investment	Millions of 1991 Colones	3 month average	BCCR
DE	Change in stocks	Millions of 1991 Colones	3 month average	BCCR
X	Exports	Millions of 1991 Colones	3 month average	BCCR
XB	Exports of Goods	Millions of 1991 Colones	3 month average	BCCR
M	Imports	Millions of 1991 Colones	3 month average	BCCR
MB	Imports of Goods	Millions of 1991 Colones	3 month average	BCCR
IG	Government Income	Million Colones Deflated with PG	Thru last month of quarter	BCCR
RA	Customs Duties	Million Colones Deflated with PG	Thru last month of quarter	BCCR
RR	Income Tax	Million Colones Deflated with PG	Thru last month of quarter	BCCR
RV	Sales Tax	Million Colones Deflated with PG	Thru last month of quarter	BCCR
RC	Consumption Tax	Million Colones Deflated with PG	Thru last month of quarter	BCCR
GG	Draft Expenses	Million Colones Deflated with PG	Thru last month of quarter	BCCR
GT	Transfer Expenses	Million Colones Deflated with PG	Thru last month of quarter	BCCR
GI	Interest Expenses	Million Colones Deflated with PG	Thru last month of quarter	BCCR
GDI	Internal Debt Interest Expenses	Million Colones Deflated with PG	Thru last month of quarter	BCCR
GDE	External Debt Interest Expenses	Million Colones Deflated with PG	Thru last month of quarter	BCCR
GCB	Bank Commission Expenses	Million Colones Deflated with PG	Thru last month of quarter	BCCR
M1	Monetary Balances	Million Colones Deflated with PD	3 month average	BCCR
CR	Total Net Internal Credit	Million Colones Deflated with PD	3 month average	BCCR
DPC	Savings Deposit in National Currency	Million Colones Deflated with PD	3 month average	BCCR
DPD	Savings Deposits in Dollars	Million Colones Deflated with PD	3 month average	BCCR
RM	International Reserves BCCR	Million Colones Deflated with PD	3 month average	BCCR
dR	Change in International Reserves (RM)			BCCR
PIBE	United States GDP	Billons of Dollars, 1991	Quarterly data	1/
INPE	Inflation Measured with PDE			
PDE	United States GDP Deflator			1/
IPCE	United States Consumer Price Index			2/
INE	Inflation Measured with IPCE			
PP	Oil Price	Dollars per Barrel	Quarterly Average	3/
ie	LIBOR Rate		Quarterly Average	3/
tc	Exchange Rate	Colones per Dollar	Thru last month of quarter	BCCR
dev	Devaluation			
i	Passive Basic Rate			BCCR
PD	GDP Deflator			
inp	Inflation measured with PD			
PG	Public Expenditure Deflator (G)			

ing	Public Expenditure Inflation			
IPC	Consumer Price Index			BCCR, INEC
in	Inflation measured with IPC			BCCR, INEC
ipt	Transactional Price Index			BCCR, INEC
ipnt	Non Transactional Price Index			BCCR, INEC
w	Minimum Salary Monthly Index			BCCR
SOURCES:				
1/ US Department of Commerce, Bureau of Economic Analysis. Http://www.bea.doc.gov/bea/dn/home/gdp.htm 2/ US Department of Labor: Bureau of Labor Statistics, http://research.stlouisfed.org 3/ Spot Oil Price: West Texas Intermediate, http://research.stlouisfed.org				

Source: Taken from Saborío (2004).

V. 3-Stage Least Squares

Why 3-Stage Least Squares?

When estimating equation systems we find the estimator of *ordinary least squares (OLS) is inconsistent given the existence of* correlation between the errors and the endogenous variables of each equation. The OLS estimator would be consistent if the system were completely recursive, but this is not the case.

One method to obtain consistent estimations, given this problem, is that of instrumental variables. Therefore, if the system is exactly identified, the number of exogenous variables excluded in each equation would be equal to the number of endogenous variables included, and therefore the former could be used as instruments of the latter.

In our case, the system is over identified, so using a single subset of exogenous variables as instruments for those correlated with the errors would not be the best choice. This because the information on the endogenous variables included in the other exogenous variables would not be taken into account.

The two-stage least square (2SLS) proposes using a linear combination of the exogenous variables as instruments. Thus, this method proposes that the adjusted values of the regression of these variables be used as instruments for the endogenous variables included in the equation against *all* exogenous variables.

It can be demonstrated that the use of this method provides consistent estimations, although it should be noted that when estimating equation by equation, this method is of “limited information”.

The two-stage estimator, when estimating equation by equation, ignores the relation between the errors of different equations, and is therefore inefficient compared to a generalized least squares (GLS) estimator.

The three-stage least square (3SLS) method uses the information provided in the variance and covariance matrix of the errors to “gain efficiency”, i.e., it uses GLS together with the estimation of instrumental variables.

Therefore, the 3SLS estimator is consistent and it can be demonstrated that, among the estimators of instrumental variables that only use variables found within the system, is efficient.

In addition, if the disturbances are normal, the parameters estimated using this method have the same asymptotic distribution than the parameters calculated by FIML (*“full-information maximum likelihood”*), which is efficient among all estimators.

The 2- and 3-stage estimators are, respectively.

$$\hat{\delta}^{MC2E} = \left[\hat{Z}_j^{!} \hat{Z}_j \right]^{-1} \hat{Z}_j^{!} y_j$$

$$\hat{\delta}^{MC3E} = \left[\hat{Z}_j^{!} \left(\Sigma^{-1} \otimes I \right) \hat{Z}_j \right]^{-1} \hat{Z}_j^{!} \left(\Sigma^{-1} \otimes I \right) y_j$$

Where $Z_j = \left[Y_j X_j \right]$, $\delta_j = \left[\gamma_j \beta_j \right]^{!}$ and Σ is the variance – covariance matrix of the errors, j refers to an equation in the system and the variables with “chapeau” refer to estimates.

It can be noted that the difference in the parameters estimated is due to the inclusion of the variance – covariance matrix, as GLS is used, which is done to take the correlation between the errors of different equations into account.

Appendix 3

Opinion of Expert Panel on the Strengths and Weaknesses of Sportfishing in Costa Rica

Following are the answers to the questions posed to each of the 30 experts consulted in 2009.

In your opinion, why is Costa Rica an important sportfishing destination in Central America?

1. In Costa Rica the most important destinations are Quepos and Papagayo, since there are protected areas for sailfish and marlins. But it is an important destination because of the number of sailfish and marlins, the species that US anglers seek.
2. Because Central America has historically maintained one of the best stocks of sailfish in the world and, in addition, Costa Rica is close for US anglers.
3. Costa Rica has the oldest fishing club in the world that has held many international tournaments; nowadays communication technology is very good and Internet users know us better.
4. Costa Rica is known worldwide as the sailfish capital, plus the infrastructure facilities for sportfishing and the security of the country, make it one of the three most important sportfishing destinations.
5. First: The diversity of species such as sailfish, marlins, mahi-mahi and tuna, for offshore fishing; roosterfish, mackerel, red snapper, rainbow for inshore fishing, near the coast.
   Second: Our country and the fishing areas are near our target market, US anglers.
   Third: The weather in the Central Pacific area, in summer and winter, which is very stable.
   Fourth: Hotel and fishing tour operator infrastructure.
   Fifth: Ease of access by road and national and international airlines.
   Sixth: Promotion and marketing by our companies for over twenty years.
6. Costa Rica today is an important sportfishing destination given the very productive and great variety of fishing areas, the different fish species, the most important being sailfish. In addition, the proximity and ease of travel for US anglers, as well as the quality of hotels, ports, yacht rental and the tour operators supporting the yachts; the private sportfishing industry is essential for Costa Rica as a sportfishing destination.
7. I believe it is one of the places where fishing is very good; in the Pacific you can easily catch marlins and mahi-mahi, and there is abundant marine life. It is difficult to see this in other countries.
8. In my experience, because of the country's stability; secondly because it lends itself to the activity thanks to the variety of species. Costa Rica has a lot of fame but it is decreasing. It became very famous for its sailfish, especially among US anglers.
9. First: you can fish all year, there are more fishing destinations, much more accessible than in other countries. Renown local and foreign captains, hotels and services rendered.

The fishing areas in Guatemala are far away from the capital and are not accessible.

10. Because of the majority of world records obtained by captains in Costa Rica.
    Because of the hard work of the people who started sportfishing, who promoted and gave a reputation to sportfishing in Costa Rica.
11. Because of the infrastructure, the experience of local anglers, together with good marketing of sportfishing and the existence of favorable natural factors.
12. Because Americans like to come to Costa Rica.
13. Because of the fishing itself in the country, because of the way sailfish are biting.
    Because of the fishing reports and the advertising for Quepos.
14. Because there is good fishing all year; 2009 has been one of the best fishing years. It is said Guatemala is a good place, but some friends went and saw it's not really true, Costa Rica is better, everyone says Costa Rica is one of the best places to fish; also, the fishing areas are not so far away, not like in the United States where you have to sail quite a distance, 70 miles and in the end you don't fish as much as in Costa Rica, where you can sail 30 miles and the fishing is better.
15. Firstly, because it is one of the best places in the world, because of the climate, you can catch the best specimens and world records have been established according to IGSA.
16. I believe Costa Rica still has a reputation as a relatively safe country, with world class fishing. The airlines are convenient and the trip usually costs around $500, so it is easy to come to Costa Rica; vacationing still costs a fair price and we continue to catch fish.
17. Because of the abundance of sailfish and marlin.
18. Because Costa Rica has the best fishing.
19. Because fishing is good and the country is nice.
20. Because it is near the United States, because of the number of fish and the variety of species. Also because of the facilities the country offers.
21. People used to go to Mexico, it was the most famous destination for sailfish and marlin, but many companies started to fish and over exploited the fishery; then studies were made and found Costa Rica is special for fishing, but now we are having a similar problem and overfishing is affecting Costa Rica. Also, another important point for the country is the possibility of visiting volcanoes, natural tours, aside from good fishing, especially in Quepos.
22. These are some of the favorite waters for anglers in June, July and August, because of the quality of the water.
23. The country is beautiful, people are friendly and fishing and tourism are world class and the sea is calm.
24. Costa Rica has some of the richest fishing in the world. There are very few places in the world where the anglers can catch dozens of sailfish and black, blue and striped marlins. In addition, Costa Rica is very near the United States by plane and can boast of its fishing variety, near the coast as well as along the coast, with excellent hotels and resorts.
25. Because we have wonderful and beautiful things in the sea; nature.
26. I believe Costa Rica has the best fishing in the world, because the water is very calm and because of the different species that can be captured; catching a marlin is thrilling.

27. Because here we still have species to fish, since in other countries fishing is very bad, here you still have the opportunity to fish.
28. Because there used to be a great number of fish and because of the size of those fish.
29. In these 15-18 years of my experience, I would say that because of the great affluence and marine wealth that we have; we have the raw material, the product. That is why there is investment in this sector.
30. Right now we are in trouble, fishing has gone down a lot and the situation is changing, now fishing is better in Guatemala, Panama, Mexico and Cabo San Lucas. But allegedly the country is an important destination, because the anglers say Costa Rica is a very quiet place.

1) What makes Costa Rica a different sportfishing destination:

CENTRAL AMERICA:

1. Costa Rica is among the 40 best tourism destinations, they come not only to fish (mainly Americans) but also because of other tourism activities.
2. Because of the catch and release of the fish in all the sportfishing sector, not to mention the size of the fish.
3. Our democracy, our people, education and security above all.
4. The professionalism of the captains, the equipment available (boats) and, although we don't like it, sex tourism.
5. The nearness of our country with respect to our target market, the United States, and the fishing areas.
   Hotel infrastructure and sportfishing tour operators.
   Ease of access by road and national and international airlines.
   Diversity of species such as sailfish, marlins, mahi-mahi and tuna, for offshore fishing; roosterfish, mackerel, red snapper, rainbow for inshore fishing, near the coast.
   The weather in the Central Pacific area, in summer and winter, is very stable.
6. Costa Rica is different from other Central American countries as a sportfishing destination because it offers anglers a perception of quietness, stable government and a large variety of tours and activities for those who don't fish.
7. In Costa Rica you can fish in winter and summer.
8. Many types of fishing, bottom fishing, variety of fish species. But I have no experience in other countries.
9. Costa Rica is number one, it is a beautiful country.
10. The other Central American countries have many limitations.
11. Capacity of the personnel, many captains speak English, strong promotion of sportfishing by ICT.
12. Because of the treatment given to the people.
    Service from arrival at the airport.
    Quepos is very important for North Americans.
    Because there are fishing tournaments, once a year in January.
13. The infrastructure, human quality and fishing fleet.
14. The good service given to clients, since they arrive at the airport we try to treat them well so they will come back again.

15. Partly because of the facilities that exist, companies with experience in the south, sportfishing has existed in the south since the 60s; because of the opinions appearing in the most important sportfishing magazines.
16. Other places in Central America are more dangerous, less comfortable and less convenient.
17. I don't know how it works in other Central American countries… perhaps because of how Costa Ricans behave.
18. We can fish all year.
19. Because fishing for marlin and sailfish is better, since Costa Rica is more expensive; commercial fisheries are starting to affect the fish stocks.
20. Because of security.
21. People come because fishing is good all year, because of the volcanoes, rivers and before because of the excellent prices, now it is becoming expensive.
22. Right now there isn't much difference, other countries are better like Guatemala, the advantage is not great, but what benefits the country is the political system, peaceful (no guerrillas).
23. Because it is safe, friendly and easily accessible.
24. Quality of fishing, security, infrastructure, educated people and circle hooks are mandatory by law.
25. Our natural wealth, we are pleasant, sometimes Americans come and they like nature.
26. Because of the variety of boats and prices in Costa Rica. Marina Los Sueños is one of the best in the world.
27. They feel safer in Costa Rica.
28. Right now we have the worst conditions and that is why the market has gone down.
29. Firstly because North Americans like the country, Costa Rica is quieter and safer than the other Central American countries, despite the problems with insecurity affecting the country. In addition, people are friendlier. Because of the treatment of anglers in the country.
30. From what the anglers who come to fish in Costa Rica say, the country is different because we are friendly and service-oriented people.

OTHERS AROUND THE WORLD:

1. Also possibilities for investment, Costa Rica is among the 3 top countries providing security to investors.
2. No answer.
3. The nearness of Costa Rica to the United States, which is the main fishing market.
4. The abundance and size of the individuals captured in the southern part of the country is unique in the world.
5. Promotion and marketing by our companies for over twenty years.
   Hotel and fishing tour operator infrastructure.
   Ease of access by road and national and international airlines.
6. Costa Rica is different from other countries as a sportfishing destination, offering a wide variety of species per trip, as well as a large number of fish bites per trip, more than in other countries.

7. I don’t know much, I don’t know how it is in other countries, but in other countries fishing is not so good, they have to go far in order to fish. In the United States they have to sail about 70 miles, and the same is true for Spain; it is not common for them to see mahi-mahi, but in Costa Rica it is common.
8. I don’t know about the rest of the world, Quepos is very famous, North Americans speak very well of Costa Rica.
   Costa Rica is less expensive compared to other countries, the amount of fish and the fishing areas make a difference, you don’t have to travel great distances.
9. Because of the climate and the whole country in general.
10. Costa Rica can compete against Mexico and Australia, although those countries may have better infrastructure, we did not develop appropriate places (especially in the southern area) for customers to enjoy a better stay; what makes the country competitive is the quality and the performance of the captains; the southern part of the country has not been developed.
11. There are two elements: hotel infrastructure near the beach and private sector boats.
12. Because they like Costa Rica, the locations where they fish, the vegetation, the treatment, the view in the hotels.
13. The type of people, the treatment, fishing is better, in the United States they have all of the infrastructure but fishing is not good, Costa Rica has the resources.
14. The climate, there are good yachts, the service and the fishing method; other countries use lures, here we use live bait.
15. Because of the special fishing conditions.
16. We still have some of the best sportfishing areas in the world, at a fair price. If someone travels to Australia, Hawaii, Bermuda or the Bahamas they would have to spend a lot more on the vacation… Costa Rica is still affordable.
17. Because of our diverse tourism: volcanoes, rivers, national parks, etc.
18. Because of the climate and how much you can fish.
19. Because fishing is better and it is less expensive.
20. Because of the security, the country is closer and you catch more fish than in the United States, the prices are not so high. But Costa Rica is not protecting the fish stocks. INCOPESCA is not doing anything to protect the fish, in Puntarenas sailfish is sold for $0.14 per kilo, when a live sailfish can generate $500 or $1000, then it is released and can be captured again.
21. Because national anglers are using new fishing techniques (for example circle hooks that don’t kill the fish, Costa Rica launched this technique), and another advantage to preserve the fish stocks is that in Costa Rica there is catch and release.
22. I’ve never fished anyplace else, I wouldn’t know how to answer that question.
23. Because it is safe, friendly and easily accessible.
24. No answer.
25. Because we are beautiful people. I’ve been to other countries, like France and other developed countries, but they don’t have what we have: nature.
26. Mainly because of the marinas and the quality of the boats; I’ve been to Guatemala and Panama, Costa Rica is far better.

27. Going to South Africa or Australia is much farther away, Costa Rica is closer; here you catch more fish than in the United States, plus there you have to sail 80 miles to fish, here you can fish at 30 miles.
28. Because of the protection given to the species; but Guatemala and El Salvador are ahead of and better than Costa Rica, because they already banned longlines.
29. Because of the number and season for sailfish and marlin which are very good in Costa Rica.
30. Previously because of the excellent fishing, if the President would support it, we could rescue sportfishing in Costa Rica.

2) What are the main economic benefits of sportfishing for Costa Rica?

1. Sportfishing goes hand in hand with supermarket chains, since they stock many products for the time boats are at sea.
   Also, the benefits should take into account the foreign currency for the country, and in addition it generates jobs.
2. Produces thousands of direct and indirect jobs.
3. There are many benefits, when you consider there are 3 people working per yacht, in addition to the offices and other people who benefit indirectly.
4. According to the studies carried out in our country, catching and releasing a sailfish means $3,700.00 the customer is spending while on vacation. Taking this into account, a sailfish can be captured and released several times if done right.
5. Foreign income for the country, when entering by air, in airline ticket taxes.
6. My biggest benefits from the business come from private yachts visiting Costa Rica each year because of the sailfish and marlin season.
7. There are many benefits for the Playas del Coco area, restaurants, souvenirs and for the whole town.
8. They come and stay in hotels, sportfishing companies make a living from this. Foreign currency, an angler comes to Costa Rica and fishes 2 or 3 times, they spend in car rentals, restaurants.
   Fishers are changing from commercial fisheries to sportfishing and this is causing a change among fishers in the area; generates jobs.
9. MINAE did a study 5 or 8 years ago, a sailfish captured in recreational fisheries generates $700 for the country in hotels, restaurants, boats and transportation; while one sailfish in commercial fisheries generates $20.
10. Many benefits, transportation, hotels, fuel expenses that translated into tax revenues for the government and for the people dealing in bait, providing the food, the marinas, employment, people caring for boats, mechanics, airlines, etc.
11. Direct employment, there is an umbrella effect, the use of hotels and restaurants.
    Many indirect jobs, bartenders and waiters. Transportation is very important.
    There is a significant link effect between sportfishing and all other sectors.
12. Jobs for people and development for the area.
13. There are benefits for all; when an angler comes in he brings benefits to hotels, boat crews, taxi drivers, restaurants, sportfishing company employees, foreign currency for the country and almost everyone benefits, anglers fish 3 or 4 days. Generates large amounts of foreign currency.

14. The customer spends in airfare, restaurants, taxis, vans, hotels, etc. We all win.
15. I would say the generation of direct and indirect jobs, air taxis, hotels and restaurants.
16. Sportfishing is the most important part of the tourism business in Costa Rica. Anglers spend $2,000 on average every time they fish in Costa Rica. This money benefit airports employees, taxi drivers, hotels, condominiums, grocery stores, yachts, restaurants, souvenir shops, golf lessons and more. Anglers spend a lot more money than other types of tourists.
17. It helps the entire tourism sector, hotels, transportation, restaurants and all other areas.
18. Anglers bring in $800 from fishing and this money is spent throughout the tourism sector.
19. Hotels, restaurants, airlines, supermarkets, taxis, and another important thing is that fish are not killed and can be captured again.
20. Employment, foreign currency.
21. The best income for the country comes from sportfishing, half a day of fishing brings $600 or $700 and up to $1500 depending on the quality of the boat, and this is divided between captains, employees and taxes paid by incoming anglers, hotels; in addition, anglers fish 3 or 4 days and they talk to new people and recommend the country.
22. Fishing boats pay very high tax rates, so funds are obtained from them.
23. It brings people to Costa Rica and they visit the various tourist destinations in the country.
24. For tourism. Sportfishing brings thousands of tourists to Costa Rica each year. Anglers are conservationists above all else, and they don't come to see how many fish they can catch and kill, but rather what they can catch and release. This conservationist position ensures sustainable fishing. Sportfishing is a very expensive hobby that generates income for hotels, restaurants, transportation, souvenirs, tour operators, taxes, etc. At the same time the various sectors grow and create more jobs for people.
25. For the marinas, I don't see any benefits for the town, they don't buy anything in town, the people who organize these trips keep the anglers away from the town, they are destroying Golfito.
26. It attracts a lot of tourism. People who like sportfishing take several full tours and are more profitable.
27. Hotels benefit, it also creates many jobs; but because of the economic situation there are less tourists this year, even the number of anglers coming to Costa Rica has decreased.
28. Jobs, foreign income. Rather than spending all their money in an all-inclusive hotel (where only the hotel owner benefits), anglers spend it on the street in different activities. Among tourists, anglers spend the most money.
    Flamingo 32 years ago used to be one of the best 10 places to fish in the world; it was thanks to sportfishing that tourism developed in Guanacaste.
    But Costa Rica is at a point of no return, if something is not done this year there will be no fish stocks.
29. Because of the jobs it creates, many dividends; sportfishing is a chain that benefits the towns, the country, hotels, different activities, tours and lots of foreign currency.

30. According to the socio-economic study done in the United States, anglers not only come to fish but also participate in other activities in other places.

3) Which tourism activities benefit directly or indirectly from sportfishing in Costa Rica and how?

1. Tourism sector employees benefit, hotels (due to agreements to offer more activities and services for tourists); supermarkets from liquor and other items on board boats.
2. Eco-tourism, restaurants, taxis, bait suppliers, bars, local airlines and hotels.
3. Hotels (lodging), car rentals, national parks; because usually when a family travels not all members fish and they visit national parks and other tourist attractions in our country. Restaurants, souvenirs, etc.
4. All activities that promote the sustainable use of resources.
5. Direct benefit:
    - Work for sportfishing companies, updated fishing gear and techniques.

   Indirect or environmental benefit:
    - Business for the national airline TACA, domestic flights on SANSA or NatureAir, as well as hotels, car rentals, restaurants, bars, casinos, taxis etc.
6. Our facilities serve as a guide for our customers about the other businesses, including other hotels, charter flights, airline flights, tour guides, taxis, car rental, local tours and hiking. Most of these arrangements could not take place if sportfishing did not originally attract the customer to our country.
7. Land tours, because they don't only come to fish but also to see Costa Rica, national parks, volcanoes and rivers.
8. Canopy rides, anglers come to see Costa Rica, they visit rivers, volcanoes, nature areas, several tours in general.
9. Many anglers visit beautiful beaches, they play golf; they come for tourism in general, volcanoes such as Arenal in La Fortuna, canopy rides, etc.
10. Costa Rica has developed thanks to ecological activities since 1960, nature tours.
11. Directly, we have the boat and motor maintenance industry, sportfishing gear sales, rods, reels and others, groceries for the boat, fuels, direct jobs in the area.
    Indirectly, handcrafts, t-shirts, caps, if a fish dies it is donated to the schools.
    The entire country benefits from the activity and promotion is by word of mouth among anglers.
12. Canopy rides, rafting, horseback riding and hotels.
13. Hotels, a large percentage for air travel, airlines, sportfishing companies, advertising, ads in American magazines, restaurants and stores. Anglers spend a lot of money.
14. Hotels, airlines, yachts, private transportations and vans.
15. In the south Pacific area eco-tours, diving and surfing.
16. Each business in Jaco benefits from visiting anglers. They spend their money on canopy rides, ATV tours, national park tours, grocery stores, restaurants, hotels, condominiums, bars, spas, golf lessons, etc. Without anglers Jaco would be empty with the current economy.
17. Transportation, hotels, national parks. All of this sector is associated.
18. Hotels, (air) transportation industry, restaurants, car rentals.

19. Anglers come for three days, they can spend $2000 in three days in transportation, hotels, restaurants, airlines, supermarkets, taxis, tours, national parks (rainforest). It should be noted that they drink a lot and at night they look for women.
20. From the moment they each the airport, car rental companies, restaurants, hotels, taxis, airlines, boats, etc.
    Anglers come to spend between $700 and $800 per day. Surfers, for example, spend $112 per day.
21. They not only come to fish, they also take tours, national parks, diving, the whole town benefits.
22. Hotels near the coast.
23. In Golfito and Flamingo, where we buy all of our bait, sodas, beer, water, as well as ice and food, fuel for the boats and hotels, car rentals, taxis etc.
24. For tourism. Sportfishing brings thousands of tourists to Costa Rica each year. Sportfishing is a very expensive hobby that generates income for hotels, restaurants, transportation, souvenirs, tour operators, taxes, etc. At the same time, several sectors grow and create more jobs.
25. None, because they don't even go to the supermarket, the people responsible for organizing sportfishing trips take the anglers out from 5am to 5pm and when they come back the women are already waiting for them; they are doing great harm to Costa Rican women, I've heard the anglers talk about them.
26. It helps ecotourism and the communities, since the people staying at Los Sueños go to Jaco or Manuel Antonio and spend a lot of money, there are many things to do in these places.
27. Different types of activities such as: kayaks, rafting tours, horseback riding, canopy rides, hiking in the mountains, beaches and many tourists come to see the turtles.
28. All other tourist activities: canopy, etc. Anglers come with their whole family and stay for a week, spend 3 days fishing and later or during those days, the rest of the family enjoys the different tourist activities offered by Costa Rica.
29. Anglers come with their families and stay one or two weeks, they enjoy the different tourist activities such as rafting, canopy, etc.
30. It benefits the owners of hotels, vans, local anglers and captains.

4) Taking into account the existence of multiple sportfishing destinations in Latin America and the world, what is needed to make this country more competitive? (question refers to hotels, infrastructure, transportation, etc.)

1. The important thing in tourism is customer service, the treatment they receive is very important in case they don't catch anything.
   The roads are not very good, but that is not a big problem, the problem is the signs; regarding hotels, some provide good service and transportation is fairly good.
2. Better roads and construction of ports.
3. We have to strengthen INCOPESCA as fisheries regulating entity, in order to have better controls over longline fisheries that have damaged and exploited our fishing resources.

4. Our country has nothing to envy from other countries in this sense, but it must adopt similar regulations to protect the resource, since other countries have laws to protect the sector.
5. A. In the first place, modify the law (INCOPESCA) with respect to catches and sales of sailfish and marlin by commercial fisheries.
   B. Facilities to import boats and equipment for sportfishing and tax exemptions for them.
   C. Improving infrastructure such as roads, bridges, airports, marinas, ports, monthly rather than annual fishing licenses.
   D. Promotion and marketing by ICT of events such as Boat Shows, in destinations such as USA, Canada, England, Italy and France.
6. In order to remain an attractive destination in a competitive market, Costa Rica must protect and ensure that the fish stocks will remain sustainable for sportfishing. WITHOUT FISH THERE IS NO BUSINESS! Costa Rica must also improve public safety for Costa Ricans and tourists alike. It is also important to improve the infrastructure in a sustainable manner. Enabling potable water, residual water and solid waste disposal, everything affects tourism. Safe and dependable roads are the main concern in some coastal area developments.
7. As far as hotels, we are doing fine. We need to improve the roads, signage, they don't exist in some areas. Transportation is fine, there a many car rentals. There is a fight against commercial fisheries because they have done great damage, the government pays too little for marlins, the government should not allow this situation, protecting 30 miles from the coast, fishing lines kill everything, the sportfishing sector doesn't take anything, everything is returned to the sea.
8. The situation is now better in Guatemala because commercial fisheries are killing sailfish in Costa Rica and Guatemala is better positioned in that sense, the roads are being improved somewhat.
9. Basically work has to be done to preserve Costa Rica, it should be a destination to attract all types of tourists, since Costa Rica is becoming somewhat expensive, prices should not be high, investing in infrastructure, hotels are doing well but not the surrounding towns and that affects them.
10. The proximity of Costa Rica to the United States is one of the best advantages so, for example Africa has very good fishing, but because it is farther away it is more expensive.
    New marinas.
    Better facilities attract captains and boats.
    Fishing in Costa Rica is expensive compared to Mexico for 2 reasons: fuel is much more expensive in Costa Rica and 2) because of the competent captains we have here, American captains taught local captains.
11. A lot of help from the government, there is a need for more interest from the government as well as communication, there is lack of information for tourists and anglers to learn about sportfishing destinations. One problem is how far away the southern area of the country is and bad roads aggravate the situation. One sailfish in sportfishing generates 2000 or 3000 **dollars** while one sailfish in commercial fisheries brings 3000 **colones**.
12. The price of fuel is very high, not so much for anglers visiting the country but for sportfishing companies, due to operating expenses, fuel is very expensive

in Costa Rica, in Panama it is very cheap, work should be done on exempting fuel for sportfishing from taxes.

13. Mainly due to deterioration of the roads, tourists complain a lot about the state of the roads, bad service at airports, the country is doing fine as far as hotels.
    Costa Rica is very expensive.
14. Some improvement to infrastructure and price control; an entity should regulate prices in hotels, etc, given the differences in prices for foreigners and nationals.
    Problems with INCOPESCA, it is necessary for INCOPESCA to help and give more importance to sportfishing, because now it is focused on commercial fisheries. They have to be more flexible, because they charge anglers for a one year license although they only fish 4, 3 or half a day and still have to pay for the one year license, in addition they have to pay taxes here and there. I have heard in Los Sueños there is no charge for the license (since it is a luxury spot), in Quepos there is a charge for the license, they need to be more flexible.
15. I believe we have many customers because of the fish found in Costa Rica, they say Costa Rica is expensive, but even though it is expensive, they keep coming. Mexico is cheaper, yachts have become expensive, prices have increased again and again, with the economic situation the prices are decreasing, but in Quepos it seems they are trying to increase; rates are apparently going down in the North Pacific.
16. I believe infrastructure in the fist place, access to the places, then the organization of those providing fishing services, safety in fishing operations since few people have knowledge of first aid, we need many people in the sector who can communicate in English. Costa Rica needs to continue offering affordable and safe vacations, with world class fishing of sailfish, marlin, mahi, tuna, tarpon, snook and others. We need to be free of the drug addicts and thieves that attack tourists. We need for the government to work with the airlines to ensure low fares inside Costa Rica. The banking system needs to be improved. Tourists don't want to bring cash to Costa Rica, but ATMs don't operate well and not everyone accepts traveler's checks. If tourists can't get money they can't spend it.
17. Laws on commercial fisheries are improving, which was very important, both for exports as well as local consumption of sailfish and marlin, this improvement started one month ago, but they are still working, all because the sailfish and marlin stocks are decreasing. Infrastructure is fairly decent.
18. Improving infrastructure, cleaning the water (it is polluted).
19. Stopping commercial fisheries, INCOPESCA favors commercial fisheries.
20. Infrastructure is OK, but what has to be done and what people complain about is the lack of protection for billfish; the law exists but cannot be implemented (this is the only thing in which Guatemala beats us, they do not allow commercial fisheries at 50 miles) and they cannot implement it because one of the directors of INCOPESCA is the owner of a commercial fisheries fleet.
21. Marinas have to be improved (where you find fuel, stores, offering great facilities for customers, etc.), they shouldn't be so expensive, $100 per day does not help the angler, roads should be improved, customers can be lost

because they can't access the beaches given the state of the roads, overall improvement, really.

22. It is necessary to improve regulations, Costa Rica is the only place killing tons of white marlin, no other country does that.
    In addition, we have been waiting for a marina for 6 years, but corruption problems have prevented it.
23. Improving the roads would be useful, most people hate to travel from the airport to the coast. If the new roads were to be completed that would be a great improvement.
24. Focusing more on prohibiting or limiting longliners. Strict laws against drugs, prostitution, robbery and other crimes targeting tourists.
    Roads need to be improved, as well as signage. Infrastructure and safety are needed to fix and improve coastal areas. More funds are needed to improve the quality of school education and to create programs to teach the children the tools and trade that will help them in the tourism industry when they become part of the labor force.
25. It is important that when tourists arrive they are helped at the airport, guided, advised on fares charged by taxis, hotels, restaurants, etc; activities should be announced and promoted so the anglers can bring their wives and go to the malls, there are beautiful stores for them and activities for their children. If all services provided were of excellent quality, tourists would recommend the country and more would come.
    In Puerto Jimenez, for example, there are very expensive hotels, on the one side the town and the rich and famous on the other, it would be great if they could be integrated so the tourists could experience the town, hotel owners and fishing tour organizers should promote this as well, rather than pushing the locals out or making tourists think they are savages.
26. More marinas should be added.
    Work should be done on improving the corruption issue.
27. In marinas, I believe we need more, there are only Los Sueños and Flamingo, anglers prefer to go to these places for comfort, the hotels are very close. However, in places without marinas, they need to coordinate and pay for transportation to take them to the beach and ride dinghies to the yachts. At least two marinas are needed in Guanacaste, with the appropriate permits (the government should collaborate).
28. In infrastructure we are not doing bad, collaboration is needed regarding the use of tax-exempt fuel, INCOPESCA gives commercial fisheries this benefit, but not to sportfishing; reinforcing conservation laws. Fish are not lost to sportfishing because they are returned to the sea.
29. Standardizing the prices charged in Costa Rica, since there are great differences, coming to Costa Rica is expensive in itself but in addition there is no standardization among tour operators and in Costa Rica operating costs are high. Indiscriminate killing of fish stocks is a big problem and we are trying to protect them by forming associations, the population of these fish (sailfish and marlin) has been drastically reduced in the last 4 years. But we have problems with commercial fisheries, we don't want them to disappear, we want sustainable fisheries. Finally, good services, professional services.
30. Improvement in itself is possible, but what we have to do is to protect each one of the species anglers seek, sportfishing catches the fish and releases it, but longline commercial fisheries kill everything.

5) Considering the marketing and promotion activities implemented by other countries to attract US anglers, what are the main challenges for Costa Rica to attract more anglers?

1. Strong advertising, road infrastructure, customer service, more should be invested in these.
2. Very low budget for promoting sportfishing. The government is far from understanding the importance of its benefits for the country.
3. Our country has become a very expensive destination for some people, I believe this should be improved because countries such as Guatemala and Panama are less expensive and fishing is better.
4. The angler sector in the United States is not very large, my 27 years of experience tell me this, the best advertising is the angler himself and his fishing in Costa Rica, this is a privileged place.
5. a. In the first place, modify the law (INCOPESCA) with respect to catches and sales of sailfish and marlin by commercial fisheries.
   b. Promotion and marketing by ICT of events such as Boat Shows, in destinations such as USA, Canada, England, Italy and France
6. Most US anglers would like to have the certainty of high probability of catching several fish. Conservation is necessary to ensure sustainable fishing grounds. Personal safety is always a growing concern, the quality of the vacation, as well as the activities not related to fishing, are important in order not to discriminate against tourists when they select a destination.
7. Commercial fishing is a fundamental aspect since it keeps anglers away, Guatemala and El Salvador are working to avoid this problem with commercial fisheries; Mexico protects 40 miles.
8. Promoting sportfishing, removing bureaucratic barriers, many areas are being closed to fishing, providing more access to fishing spots, helping anglers.
9. Better facilities, hotels. Our company saw a 40% decrease in sales because of the financial problems around the world, we have repeat customers, but everyone is affected by the economic situation.
10. Lots of publicity, Panama is a lot better in this sense, with great advertising Costa Rica can compete with other countries.
11. The challenge is not to prostitute oneself, not selling with Costa Rican women included, trying to have an ethical slogan and ethical behavior, since sportfishing is also known as a sex and liquor destination.
12. Repairing the roads, too much insecurity and tourists are robbed in the beaches; regarding economics, we are too expensive, they are charged too much, they have to pay INCOPESCA (they have to pay for one year's permit for one day of fishing).
13. Raising awareness among the public and the government regarding sportfishing, the government doesn't really know how much money sportfishing generates; great amounts of foreign currency.
14. There is great competition in sportfishing, lots of money spent, perhaps more advertising, each company advertises separately, but small businesses in Costa Rica don't advertise, the use of the Internet is very important and facilitates promotion.

15. I believe we need investment by the State to promote this activity, it is non existent. Individual companies try to promote themselves, most of the customers are in Florida.
16. We need to spend more money in advertising targeting anglers… magazines, travel shows, US local newspapers, websites, direct emails and more. Hawaii, Puerto Rico, Mexico, Bahamas, Jamaica, all of them spend more money than Costa Rica in advertising. They also work with airlines to get lower fares.
17. Trying to market in Europe, they don't have the same culture than Americans, barely one percent of anglers come from Europe.
18. Alaska and Canada have better promotion and marketing, Costa Rica has to attract various types of anglers from different sectors or characteristics.
19. We need to market the country better, a good way of doing this is to take advantage of the good initiative they are trying to implement to protect sailfish and marlin, this is good because people in the United States would learn about this and would be interested in coming here, because they know fish are being protected and would return.
20. Costa Rica does not face challenges in attracting North American anglers, but if billfish stocks were protected anglers would come, three times more than now.
21. There are none, because United States is over-exploited, Mexico is still doing fine but is over-exploited as well, you have to sail 70 to 100 miles to try to catch something, in Costa Rica you only need to sail 30 miles and find good fishing, the advantage here is that the fish is captured and released, it does not affect the billfish stocks.
22. I wouldn't know what to say… in Flamingo there is no marina, this infrastructure is necessary to provide comfort to the customer, that is why fishing is better in Quepos.
23. Perhaps some advertising and TV programs.
24. Making ourselves known. Many people have heard about Costa Rica and although the name is well known, the country is still confused with Puerto Rico or with an island. Many documentaries and/or movies that mention Costa Rica show images of beaches or dense jungle, but Costa Rica needs to show the image of a full service destination, advanced infrastructure, luxury hotels, resorts and educated people. Costa Rica needs to change the idea that it is a backward land, with savage people, living in the jungle. It also needs to focus on protecting the quality of our national parks, in order to protect ecotourism, because it is being jeopardized by lack of controls.
25. It is necessary to provide tourists the information they need from the time they arrive at the airport on taxi fares, where the hotels are located and their rates; providing good service (they want to carry the house with them); we need to promote anglers visiting with their wives, integrating tours to the waterfalls with sportfishing tours, taking the ladies to swim with dolphins, etc. Anglers come in to fish and then are taken straight to Casino el Rey because that is what is advertised in the United States and done in Costa Rica.
26. Many North Americans still don't know where Costa Rica is located, they know about Mexico, Florida, but not about Costa Rica. In addition, Costa Rica is easily accessible for North Americans.
27. More information on sportfishing; keep them better informed.

28. Prices, because fishing in Costa Rica is expensive, everything in Costa Rica is very expensive, fishing in one of our yachts for the whole day costs $2200, in Guatemala a similar yacht costs $1400, due to the price of fuel.
29. I believe we have to offer professional services, doing things in the best way possible every time, having a vision for the future, if good service is provided, in the future they will come back to Costa Rica.
30. Each company promotes sportfishing as best it can, but the problem is an angler coming to fish in Costa Rica because he believed in the advertisement, but if he comes and doesn't catch anything, he is going to be upset about the investment made to come all the way to Costa Rica and not finding fish; the important thing is to protect the species, if fishing is good, the customers will come.

6) How would you rate government and public institution actions in relation with:

Promoting sportfishing (in the last six months)

1. Very bad
2. Needs improvement
3. None
4. Bad
5. Regular
6. Poor
7. So so
8. Very bad, nothing is being done, so much there is a crisis in the sportfishing sector, the number of fish and of clients is decreasing
9. Better than before
10. Difficult
11. Very good
12. Regular, not good not bad, anglers complain they watch as the fish are killed at sea
13. Bad
14. Not very good: ICT promotes ecological tourism but not sportfishing, there are problems with INCOPESCA licenses
15. Non-existent
16. Poor
17. Not much has been done. That should be done by each company
18. They can do better
19. They don't do anything
20. Regular
21. Very low, they do not promote sportfishing
22. Low, they promote other things and are not much interested in fishing
23. Good
24. Poor
25. I imagine very good
26. Very good
27. I wouldn't know if the government is promoting anything
28. Very bad, almost non-existent

29. Regular, meetings have been held with the INCOPESCA President but the government is still working on it, there is only willingness, nothing more
30. I don't know what the government does

In the last five years (excluding the last six months)

1. Has taken on some strength
2. Very little
3. None
4. Bad
5. Bad
6. Very poor
7. Very bad
8. So so, it was growing on its own, it had been growing but the economic impact has affected it
9. Very good, the government can only do so much
10. Difficult
11. Almost imperceptible
12. Regular
13. Bad
14. It is not much, very little, it is not very good
15. No-existent
16. Poor
17. Worse
18. Poor
19. They don't do anything
20. Bad
21. Very little, we at the private companies do our own promotion, the government doesn't do anything
22. Low
23. Good
24. Poor
25. Very negative, before they didn't want to issue permits for marinas
26. I was not here in Costa Rica.
27. I wouldn't know, but tourism has increased and due to tourism some are interested in sportfishing, this is due to the good job of the government in opening the Guanacaste airport, for example
28. Bad
29. Regular
30. What exists is a desire by the government, the private sector is responsible for all publicity

Sportfishing regulation (in the last six months)

1. Has been very good
2. Needs improvement
3. Work is being done and we are in a management process
4. Bad
5. Regular
6. Good

7. So so
8. Very Bad
9. There are some associations in Quepos, Golfito and with MINAE who are working on setting limits for commercial fishers, the small boats need more supervision.
10. Very bad
11. We'll see, it is delayed and there is no enforcement
12. Regular
13. Bad: they don't regulate what needs to be regulated
14. It doesn't exist, a new law was enacted prohibiting sailfish on board to take pictures, we've never had a closure, problems with commercial fishers, to stop them from killing sailfish
15. The regulation is almost non-existent. They only check the boat when it sails, but there is no surveillance
16. Fair – Not executable
17. Has changed a lot, it is good because it is trying to protect sailfish and marlin, the new law doesn't allow bringing fish on board to take pictures
18. Poor
19. Many voids in the regulations
20. From bad to good
21. Very bad, the government is closing some areas to sportfishing (Murcielago), but they allow artisanal fishers, when artisanal fisheries do have an effect and sportfishing does not; there are no studies to support the decisions
22. I wouldn't know what to say, it's not too familiar; fisheries could be exploited better without so many obstacles
23. Ok. There is only a problem with the sale of fishing licenses. They should be sold for a day or a week for less money
24. Poor
25. Improving. On a scale of 1 to 10 I give it a 6. A lot of attention has to be placed on this aspect
26. Improving. Marlins are being protected
27. I think it is good, they are doing inspections to ensure people are fishing what they should be fishing according to the law
28. Bad, they treat us like commercial fishing yachts, the government does not distinguish between commercial and sportfishing; sportfishing is conservationist, commercial is consumerist
29. We haven't seen anything.
30. We are being regulated, the regulation is good in order to protect the fish we care for; but what is stupid is we protect the resources but longliners kill everything, fish and turtles

In the last five years (excluding the six months)

1. It's OK
2. Very little
3. Work is being done and we are in the management process
4. Bad
5. Bad
6. Poor
7. Good

8. Bad
9. Until 6 months ago it was horrible. The two previous administrations (Pacheco and Rodriguez) did everything to destroy sportfishing
10. They have come to be the same regulations
11. Imperceptible, artisanals and professionals are involved in disputes
12. It has improved, still lacking
13. Bad
14. It has not changed, it has not happened
15. The regulation is almost non-existent
16. Poor
17. It was good but there wasn't too much regulation
18. Very poor
19. Many voids in the regulation
20. Bad
21. Very bad, the government messes up more than it fixes
22. I wouldn't know what to say
23. Ok. There is only a problem with the sale of fishing licenses. They should be sold every day or every week for less money
24. Poor
25. Worse
26. I wasn't here in Costa Rica
27. So so. In the last two years they have been stricter and more constant
28. Bad
29. We haven't seen anything, in the associations we had been appealing to the government for fuel exemptions, they did not accept, but commercial fisheries do use exempted fuel
30. There weren't that many regulations, but these arise from our motivation

Commercial fishing regulations (in the last six months)

1. Out of control
2. Beginning to improve
3. Very few
4. The worst
5. Regular
6. Positive actions
7. Bad
8. Very good
9. A step forward, but it is not enough, I don't see any effective regulations. Pacheco and Rodriguez promoted commercial fisheries, destroyed many resources and allowed overfishing
10. They are not in agreement with what should be done for fish survival
11. Bad
12. Bad
13. Bad: has been inconsistent, some good things (important laws such as ban on Sailfish exports) but the application is bad and they cannot enforce the laws, it's only on paper
14. They have been pretty strict in trying to eliminate killings, but the commercial fishers continue with their killings

15. I don’t have enough information to give an opinion
16. Fair – Cannot be implemented
17. It’s OK
18. Good, because they have reduced the lines that are killing the sailfish
19. It’s somewhat better, but it is not enough
20. Bad, the law is there, but it is not applied
21. They have not done a good job in helping anglers or a good study here in Guanacaste. Commercial fisheries have to be regulated, but they can’t stop it since there are many families that depend on that activity
22. I wouldn’t know
23. It is not enough
24. Poor
25. Very bad. Nobody pays attention
26. Needs to be improved. I believe sportfishing is much more important for the country than commercial fishing
27. I wouldn’t know what to say, but tuna vessels have permits to fish outside 150 miles and are fishing up to 15 miles
28. Bad, there is no coastguard, there is no regulation
29. Regular
30. I don’t know how much they regulate them, but they fish a lot

In the last five years (excluding the last six months)

1. According to the standards it was not been applied well
2. Horrible
3. Few
4. The worst
5. Bad
6. From bad to very bad
7. Good, because commercial fisheries did not reach the coast before
8. Pretty good regarding finning
9. Very few
10. You can’t say it was better
11. Bad
12. Bad
13. Bad
14. There was somewhat less regulation, it has improved in the last 6 months
15. I don’t have information to be able to give an opinion
16. Poor
17. It was good and they are trying to improve it, to protect sailfish and marlin
18. Bad
19. The situation was worse than the current one
20. Bad
21. The worst: in the last 5 years it was better, but in the last 2 years many areas have been closed like Santa Rosa and Baulas
22. I wouldn’t know
23. It is not enough
24. Poor
25. Worse
26. I wasn’t here in Costa Rica

27. Pretty regular
28. Bad
29. I am not aware of it
30. I haven't seen them do anything and if they have I don't know about it

Progress of fisheries legislation (commercial and sportfishing) (in the last six months)

1. There is no balance between the two sectors, there is some friction.
2. Horrible, needs a lot of work.
3. It has improved thanks to the work of the Costa Rican Sportfishing Federation.
4. The worst.
5. Regular.
6. Bad
7. No answer.
8. It is not excellent, but good work is being done; for example, the arrival of The Billfish Foundation.
9. New laws restricting commercial fisheries, saying what they can catch, what they cannot catch and what they have to release.
10. Legislators need to come to an agreement, inconsistencies between them and the environment.
11. Slow, the fishing law already exists but cannot be applied, the regulation does not exist.
12. Bad, they allow killing many sailfish.
13. Regular.
14. There is a lot of movement and many changes.
15. Static, there is no progress.
16. Fair – Not executable.
17. Good.
18. Good, because they have reduced the number of lines that kill sailfish.
19. Non existent.
20. Has been good.
21. The worst, it is on the way, but most of it is very strict, they didn't take into account that fishers have to eat.
22. No answer.
23. It is not enough.
24. Poor
25. Has made progress.
26. Needs to be improved.
27. I am not very well informed.
28. Bad for the time being, I know there is a new package of laws. If approved it would be good, if we are able to provide the tools and equipment that the coastguard needs, this could be good.
29. Regular.
30. I don't know it and what I know is no good.

In the last five years (excluding the last six months)

1. Yes for sportfishing and no for commercial fishing.

2. Horrible.
3. Has been improved thanks to the work of the Costa Rican Sportfishing Federation.
4. The worst.
5. Bad.
6. Very Bad
7. No answer.
8. It is stagnant.
9. There is nothing (we are in the abyss).
10. Normal.
11. Almost non existent.
12. Bad
13. Regular.
14. It was not as strict as it is now.
15. Static, there is no progress.
16. Poor
17. Good.
18. Bad
19. It is non existent.
20. Good.
21. Very bad, two years ago it was regular.
22. No answer.
23. Not enough.
24. Poor
25. It was tough, they didn't want to issue permits, "but it is necessary to be more careful, boats go in and out and nobody knows anything, nobody checks who came in and out, what was brought and what was taken (there is a real problem with drugs) ".
26. I wasn't here in Costa Rica.
27. Somewhat regular.
28. Worse than in the last six months.
29. Regular.
30. I don't know it and what I know is no good.

7) In your experience, what have been the main contributions of the private sector related to:

Capital investments (hotels, marinas, boats, etc.)

1. In boats and hotels.
2. Employment and taxes paid.
3. Marina Los Sueños.
   Marina Papagayo.
4. Foreign investors come to the country to take, not to leave anything for the country.
5. Direct and indirect jobs.
   Fishing technology and methods.
   Infrastructure such as boat construction and workshops.
   Training.

6. Investment in ports, arrival of yachts and private yachts.
7. No answer.
8. Each boat creates jobs and pays taxes. Getting a boat ready implies fuel, grocery sores and other sectors: transportation, etc.
9. Hotels, marinas and boats, for example Los Sueños “the best marina”.
   The government needs to invest, control that private companies do not pollute the water, Tamarindo is horrible for that reason, the government must ensure that private companies not dump their waste in the water.
10. Very good, lots of publicity; places such as Cocodrilo advertise a lot, the market the sector.
11. In boats.
12. Good.
13. In marinas. They are building a marina in Quepos. In hotels.
14. Not much, some private US institutions have contributed something.
15. Job generation and reactivation of some areas and related activities.
16. Better boats, better captains, luxury hotels for the clients, modern marinas.
17. Marinas, boats, hotels, infrastructure is increasingly abundant.
18. They are trying to build more marinas, investment in that sense has been good.
19. Los Sueños is the main thing.
20. Very good, excellent.
21. So so, Golfo Papagayo has good services.
22. The private sector always responds by proposing ideas to create a marina in Flamingo, and at the end they can’t do anything; a project came tumbling down because of corruption.
23. Mainly hotels like Los Sueños.
24. Los Sueños Resort and Marina –the only true marina in Costa Rica- Los Sueños Signature Billfish Series.
    Los Sueños Marlin Invitational
    Other tournaments: Presidential Challenge
    Other real estate projects: Hacienda Pinilla, Four Seasons, Papagayo, Reserva Conchal.
25. More hotels, two marinas in the south Pacific, but the permits were issued because of the private companies.
26. There has been active investment in hotels and marinas. They opened one in Guanacaste and another one in Quepos. Large investments.
27. Condominiums and some hotels.
28. Investment has been huge.
29. Have been good, there was and currently is much investment.
30. Work in the surrounding areas for our people.

Policies: collaboration in creating and approving new legislation and in raising awareness among the public about the importance of this activity

1. it has provided great support.
2. Has happened and then many conservation topics are lost.
3. Work is being done in education and awareness-raising among the commercial sector.
4. It has not been achieved.
5. Creation of the National Sportfishing Federation.

Integration with international protection entities such as The Billfish Foundation and IGFA.

6. Many people have made better contributions in time and resources to raise awareness and better guide the need for changes in the legislation.
7. They should take sportfishing into account.
8. Very bad, there has been a significant contribution.
9. They do not collaborate, only work for themselves.
10. Very good, they try to operate at the margin of the law.
11. At local level the contributions have been very important, but at the macro level that perception does not exist.
12. Good.
13. Publicity, lots of publicity, people who contribute mainly for sportfishing, Costa Rica is among the 3 best places for sportfishing.
14. It has been good.
15. Distributing information; promotion for their own business.
16. I believe anglers are beginning to organize and make some political progress.
17. The owners of sportfishing companies are responsible for that, hotels and the rest of the tourism sector do not support sportfishing.
18. It has been good because they are trying to solve the problem of commercial fisheries with the longlines.
19. Some businesses.
20. Very bad
21. They do not get involved in the issue and don't know much about the topic.
22. I wouldn't know how to assess it.
23. Circle hooks were very important, now they need to address fishing longlines.
24. Very little.
25. No answer
26. I believe it is good.
27. No answer
28. The private sector has provided support, does everything possible to support anglers, so they don't set their eyes on Guatemala and El Salvador.
29. I really haven't seen much help.
30. Some foreign organizations are interested, like The Billfish Foundation.

Any other contributions?

1. Programs used to be implemented before, for example by INA, and private companies used to receive students for their internships.
2. Donations to help the communities.
3. No answer.
4. Local Costa Rican fishing associations have accomplished the unthinkable and will continue forward with this.
5. Promotion of the destination.
   Increasing the sportfishing fleet.
6. Economic and scientific studies are important tools to make changes happen.
7. No answer.
8. I couldn't say.
9. The private sector only builds marinas, hotels; it is only business.
10. They help the community, shelters for the elderly, schools, parks and coastguard (all in Golfito). Hotels give jobs to young people.

11. Raising awareness in commercial fisheries, so they release the fish for sportfishing.
12. No answer.
13. Infrastructure, publicity, awareness-raising and jobs.
14. None.
15. None.
16. American and national captains are involved in charity work that benefits schools and children in the local community.
17. No answer.
18. No answer.
19. There is a small group that formed an association that is trying to help with the legislation, promoting laws and reporting irregular activities.
20. Has contributed to providing more security, contributing some standards, paying for international advisors, but they have not been able to do anything concrete or achieve anything.
21. No.
22. Sportfishing boats are private, they are responsible for paying taxes.
23. No answer.
24. No answer.
25. No answer.
26. No answer.
27. No answer.
28. Everything moves through the private sector, we help with fuel for the coastguard.
29. No.
30. No, on occasion if we don't know about an issue or something specific, they help us out.

8) What is your opinion regarding sportfishing regulations in Costa Rica compared to other countries?

1. The laws are well defined, 40 miles maximum for sportfishing, minus the reserve areas; this is not well defined in other countries.
2. That is a joke, it is completely controlled by greedy people who are not concerned about the resources.
3. Thanks to INCOPESCA support we are working on these regulations.
4. In Costa Rica it is deficient due to lack of education and insufficient knowledge of the activity; however, this is changing rapidly.
5. Lack of landing control at the terminals by the government through INCOPESCA, to avoid indiscriminate catches of billfish.
   Better regulation is need for the fishing areas regarding: longliners up to 8 miles, sportfishing between 8 and 45 miles from the coast and commercial fisheries from 45 miles on outward.
   Control in the use of hooks, bait and number of longlines by commercial fisheries is needed.
6. Costa Rica s trying to catch up. Many other countries have made changes and improved their conservation and legislation, based on the economic importance of sportfishing tourism and sustainable fishing.

7. In other countries they do things through closures (you fish during a season and not the following one), in Costa Rica in some sectors it is not allowed at any time.
8. Some of the changes made to the laws have been good, efforts have been made to raise awareness: fishing gear, hook types, some laws have improved such as: catch and release, but we are learning in relation to other countries.
9. It is better in Costa Rica than in other countries; in addition, the captains are more competent because of their capacity and sense of conservation, they make a living from sportfishing. Costa Rica is in better shape than Guatemala and Mexico.
10. In other countries they are absurd, like in the United States where it is not allowed to catch a certain number of fish; here fishers catch as much as they want, the authorities want to change that.
11. No answer.
12. Good.
13. The sportfishing law is very competitive, but the execution is bad, some things are never applied or the laws are too silly and generate obstacles.
14. There have never been regulations for sport fishers, we never kill the sailfish, but there is regulation for commercial fishers and therein lies the problem; in the United States they tell you what months you can fish, but not in Costa Rica.
15. Pretty bad, there is no regulation for sailfish catches.
16. We can have all the regulations and rules we want, but nobody enforces the regulations. Costa Rica doesn't have the money for a good coast guard. We need more government boats in the water and the ports to stop illegal fishing. Other countries have more resources for patrolling and controlling illegal fishing.
17. No answer.
18. Costa Rica has the same problems than other countries, the laws are fine but they don't have sufficient resources to enforce them.
19. At Central American level, Panama is better at executing regulations, Costa Rica is second, Costa Rica still has a long way to go but it is trying to improve.
20. Very Bad
21. There are few regulations here for sportfishing, but they are not really needed (they do exist in national parks).
22. In other countries they are stricter I believe Costa Rica is OK.
23. Fishing here in Costa Rica is not regulated, commercial fishing companies do whatever they want, neither INCOPESCA nor anyone else is doing anything about it.
24. Very little is done here and what is done is by private organizations, mainly from the United States.
25. Regulate them, regulate how many fish can be caught, caring for the sector, if it is recreational, it is recreational. But you can't squeeze anglers too much or they will not come, you have to try to help them as well.
    They shouldn't discriminate against the French (Europeans), because they say Americans treat them better and that is not right.
26. They are the same.
27. I believe it is good.

28. There are no regulations, all existing regulations are for commercial fisheries and we in sportfishing, are included in the regulations for commercial fisheries, the licenses issued are GPC (Commercial fisheries).
29. I would say with the contribution of the association we formed, we were able to modify the law somewhat and now it is fine.
30. In Guatemala and Mexico the protect gamefish species for sportfishing, now it is tourism fishing, but longlining is killing these animals.

9) Please provide some ideas on how the sportfishing industry could expand existing commercial relations with other tourism sector and supply companies.

1. Better trade relations and contacts.
2. Educate “green tourism operations”, anglers should also be conservationists.
3. Yacht owner companies should be closer to tourism companies and thereby remove the middlemen who increase prices and scare the tourists away.
4. Through the Costa Rican Sportfishing Federation.
5. Participation in international events. Boat shows, joint agreements with ICT through exchange programs with The Billfish Foundation, IGFA, Marinas, NGOs.
6. For sportfishing this could be easy, if it is recognized by the tourism industry as a whole, if they had the option of selecting the conservation of fishing as a suggestion, use of destination for each ICT, in hotel taxes, airport taxes, car rental taxes and fees by airline users (sic).
7. If good relations exist with the other sectors.
8. For the time being it is fine. The government should promote sportfishing, they are responsible for the laws.
   There is disagreement on some INCOPESCA laws, they help somehow but sometimes they haven’t been able to agree. Regarding the Government, they should learn more about sportfishing, the only institution to have clashes with the sportfishing sector is INCOPESCA.
9. This would be like a flea against an elephant. They have to control commercial fisheries better, although there are support groups, committees in Quepos, Golfito and Puntarenas where, together with the government they try to educate the people.
10. Better INCOPESCA focus on sportfishing company owners, more patrolling, they have to be made aware they should not only do surveillance but also support fishers, not place obstacles, as is the case with the sailing permits (“zarpe”).
11. Sportfishing is very expensive for nationals, in the low season they should offer packages affordable for nationals, accessible fishing for nationals, give nationals an opportunity.
12. More publicity should be given to sportfishing, not only to tourism, improve the roads, airport cervices, regarding the hotels they are very good.
    In Costa Rica not much importance has been given to sportfishing.
13. Maybe the government can raise awareness about sportfishing, promote the sector and mix sportfishing with green tourism. Fishing brings a lot of foreign currency to the country, they need to remove the obstacles in fishing licenses, because they are killing sportfishing. Paying $25 for a license is illogical, many meetings have been held with INCOPESCA, but they never

agree in order to solve the problem, because they say this income is part of the INCOPESCA budget, but by doing this, they re killing the gold mine (sportfishing).

14. Clients complain they have to pay $25 for an individual license, to fish 3 days, when the permit is for one year.
15. Through synergies, sharing resources, creating packages, all-inclusive sportfishing.
16. I am not sure I understand the question; when I record the trips it is important to provide to my clients the best related services. The cars that take the people to the various places, hotels, canopy tours, taxis, car rentals, restaurants, etc. I work with the best people in each area to offer the best vacation experience... without surprises or problems.
17. The sector sportfishing interacts with is efficient: buying ice, bait, Coca Cola for the juices, water, fishing tackle (Borbon Company).
18. Cleaning the water, removing the pollution, not exploiting the sailfish because it affects the stocks; problems with commercial fisheries.
19. Try to improve fuel prices, so tourists can come fish and for more of them to come, the hotels are expensive in Costa Rica.
    The good thing is they are trying to stop commercial fisheries and conserve the fish, Costa Rica is trying to protect the fish and the fish are returning, which is good publicity for the country.
20. The only thing would be to implement regulations like it was done in Guatemala, not allowing commercial fisheries at less than 50 miles, this would increase the fish stocks again, if Costa Rica would do this, it would attract more anglers with their families, he goes fishing and the family visits or enjoys other types of tourist activities. Everyone benefits.
21. Some companies hold fishing tournaments, these should be taken better advantage of to integrate the companies more, the government tries to promote it but does not promote itself, the businesses do not reduce their prices to try to attract anglers to these events, in general, businesses have to get together, information needs to be disseminated, people need to know.
22. Expanding docking facilities and docks for fuel.
23. There is no comparison, sportfishing is a little loose, what influences this is the problem with commercial fisheries and longlines that kill everything (tuna, mahi-mahi they take it and hurt it), right now the commercial fisheries are 12 miles from the coast.
24. Recently we held the second stage of Los Sueños Signature Billfish 2009, and the number of marlins released was considerable higher than the number of sailfish released, close to 2 to 1. When I asked several distinguished members of the industry whether we broke any records, I found that nobody was even keeping a record. This is one example of something that can be done to unite MANY different sectors of the industry and doing something simple. Creating an entity or organization that will keep a historic record of the industry, events, tournaments, efforts, progress, etc, for public reference. No organization does this. This could save useful information that very soon any business could find useful.
    For example:
    - Number of participants
    - Indicate industry growth or strength
    - Number of fish captured per year

- Indicate fishing trends
- A database of industry sponsors
- A database of anglers / captains
- Etc.

25. The government should open small markets for Americans to see and buy all of the things manufactured by the people who live in those places, and thereby help the people as well. Restaurants don't help the people Esther, they mistreat people from the towns, they exploit them, because you really can't say they help the people with that kind of exploitation. But also, restaurants are unfair with the prices for foreigners, they charge them a lot more than Costa Ricans.
26. Better relations are needed as more cooperation between sportfishing and commercial fisheries.
27. None right now.
28. We have agreements with real estate, discounts, tours, etc.
29. More communication with tour operators.
30. No answer.

10) What are the main threats to the sportfishing industry in Costa Rica?

1. Commercial fisheries are invading the sportfishing areas.
2. Commercial fisheries and INCOPESCA.
3. Longline fisheries are the main threat, also tuna vessels are killing billfish and other species.
4. Lack of control of commercial and tourist fisheries. Lack of legislation on these two commercial activities.
5. The Government, through INCOPESCA should control, plan and receive training to promote this very important industry for the country, rather than continue selling billfish.
   Better communication and integration with our companies through chambers and associations.
6. Possibly the great threat for Costa Rica in the sportfishing industry could be the loss of sustainable fishing due to overfishing by large commercial vessels, lack of regulation and of execution in the Costa Rican legal system.
7. Commercial fisheries.
8. Commercial fisheries, access by unregulated companies offering the same service, excess number of companies.
9. Commercial fisheries, industrial waste, overfishing, climate change, water pollution.
10. Ignorance, because customer service has deteriorated due to the new generation of captains.
11. The world recession, the ENSO phenomenon because in the Pacific it is terrible at natural level.
    Lack of certification of boats and captains since many are not certified and they provide poor service and project a very bad image.
12. the is no surveillance or regulation of commercial fisheries regarding capacity and allowed catch; commercial fisheries are killing sailfish, marlin, mahi-mahi and yellow fin tuna (which is hard to find and preferred by anglers).

13. Lack of regulation of commercial fisheries that are exterminating sailfish for such low prices, 300 colones per kilo of sailfish, lack of awareness by government.
14. The killing of sailfish by commercial fishing.
15. Commercial fisheries.
16. Foreign fishing fleets that kill everything, they can do this because they have someone in the government that makes it look the other way. Imagine the benefits of sportfishing if we could keep those huge commercial boats out of our waters.
17. Commercial fisheries, given the scarcity of sailfish and marlin; the problem of global warming that is gradually affecting the passage of the fish.
18. Hotel waste is dumped in the water and therefore they pollute it.
    No exports of sailfish, commercial fisheries.
19. Commercial fisheries.
20. Commercial fisheries, which translate into indiscriminate killing of billfish (sailfish, marlin).
21. MINAE, by closing all fishing sectors where studies have been carried out in San Jose and not at sea, they don't do proper studies, the government itself makes the wrong decisions.
    Commercial fisheries, using techniques that kill all fish.
    Chinese boats (fishing fleets), particularly now with the future free trade agreement.
22. The decrease of marine species, the current economic crisis and the high cost of fuel, if you fishing now the fuel is more expensive than the fishing.
23. Longlines and commercial fisheries, they take everything, before in sportfishing you could catch 35 sailfish in one day, now you can only catch 12, 10, 5, 2 or 1 sailfish.
24. Lack of interest by the government in protecting the environment, in conservation, controlling longlines, improving security and infrastructure in the country.
25. I don't find any threats… but they should regulate some, they should have good advertising, but not only to the U.S., it should be for all.
    We should seek respect for ourselves.
26. The current economic situation and cooperation between commercial and recreational fisheries.
27. Tuna boats and commercial boats. Large Taiwanese boats.
28. Number one would be commercial fisheries, since they Hill everything without even knowing what they are killing.
    The ease of exporting sailfish to the United States.
    Lack of safety at sea, inexistence of coastguard.
29. Regarding the marinas and those that are going to be built, where the private yachts or boats are, which are very bid, they have to be regulated, since this type of boat, because it is son big, they don't treat the fish carefully, when they release it, it is so hurt it dies.
30. Lack of fish and service aboard the boats.

COMMENTS

COMMENT BY ARCOS DEL PACÍFICO

- Commercial fisheries did not use to target marlins and sailfish, now they do and sell them very cheap; on the other hand, in sportfishing they are released and the same fish can continue to be captured and generate more money.

COMMENT BY GO FISH GOLFITO

- Sailfish need to be studied.
- There is total lack of coordination between INCOPESCA and the coastguard, difficulties in obtaining licenses or sailing (zarpe) permits for tourists (in addition, the “zarpe” does nothing, it is worthless, there is no control and the port captain’s office is only open from 8 to 4 and in addition the service is bad, it does not facilitate things for tourists).
- Any foreign guy can open a business, it is difficult for Costa Ricans.
- There are absurd regulations for live bait. Tournaments where the winner is whoever catches more fish harm the fish, because they end up injured and killed.

The standards are not right, because nobody can say what is going on or how sailfish behave (spawning seasons), therefore they cannot be protected until an in-depth study is carried out.

A big problem is the price of commercial fish, because it is not stable and fluctuates a lot, therefore they have to fish a lot to ensure they will make enough money to support their families and this affects the fish stocks; if prices were controlled, the fish stocks would be protected.

It is a war, recreational and commercial fishers insult each other by radio and tourists hear all about these problems on the radio.

Appendix 4

Questionnaire Used for Tourist Interviews in Airports (Juan Santamaría International in Alajuela and Daniel Oduber in Liberia)

INSTITUTO COSTARRICENSE DE TURISMO
THE BILLFISH FOUNDATION
UNIVERSIDAD DE COSTA RICA

SURVEYOR: Please mark when this survey was taken:
1 Jan
2 Feb
6 June
7 July
8 August

1. Prior to this trip, how many times have you visited Costa Rica? ___ # of times

2. Please mark which activities you participated in during this trip to Costa Rica:

   CHECK WITH ICT
   1 Nature tours / wildlife viewing
   2 Hiking
   3 Horseback riding
   4 Sportfishing
   5 Sailing
   6 Relaxed on a beach
   7 Golf
   ADD
   MORE:_____

3. If you could not have fished, would you visit Costa Rica again?

   1 Yes
   2 No
   3 Not sure

4. Before this trip, how many other trips have you taken to Costa Rica in which you fished?
   __ trips

5. Who traveled with you, in your direct travel party, on this trip to Costa Rica?

   1 I traveled alone: __
   2 Spouse: __
   3 Kids, how many? ___ # of kids
   4 Other family members: ___ # of other family members
   5 Romantic partner: ___

6 Other friends, co-workers: ___ # of others

---

6. How many other members of your party also went sportfishing?
   ____ # of people in your travel party who fished in addition to yourself

7. How many days did you spend in Costa Rica area during this trip?
   ___ days in Costa Rica area

8. On your most recent trip, how many separate days did you fish? ___ # of days fished

---

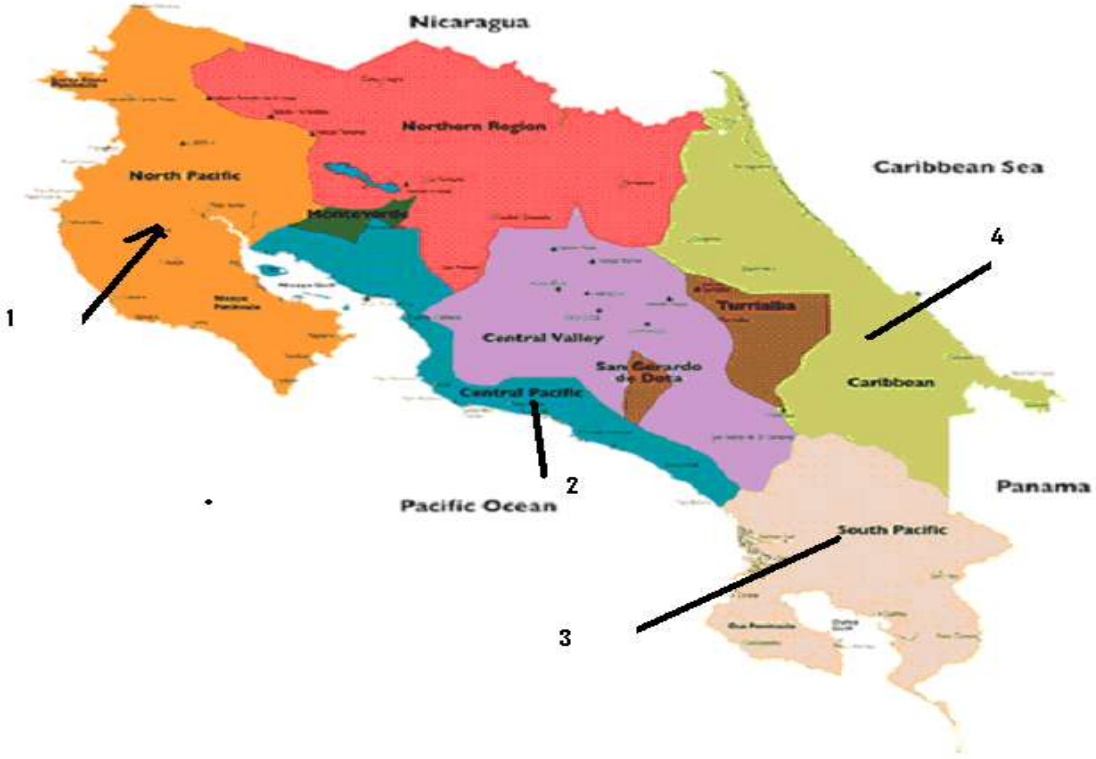
9. Please indicate all modes of fishing you used during your most recent Costa Rica trip:

   9.1 fished from a boat ___ # of days
   9.2 fished from beach/shore/seawall ___ # of days fished
   9.3 other ___ # of days fished "other"

10. Please mark which species you expected to catch when you were planning your most recent trip to the Costa Rica area, and the species you actually caught while fishing here:

N.	NAME	Targeted:	Caught:
1	Marlin (any species of marlin)	1	1
2	Sailfish	2	2
3	Mahi-mahi / mahi-mahi / dolphin (fish)	3	3
4	Tuna (Tuna)	4	4
5	Wahoo	5	5
6	Tarpon (sábalo)	6	6
7	Sierra mackerel	7	7
8	Roosterfish	8	8
9	Yellowtail	9	9
10	Bottomfish (snapper, grouper)	10	10
11	Snook / snook	11	11
12	Other	12	12
13	I didn't expect to catch any fish	13	13
14	I don't know/no opinion	14	14

11. Please mark the regions where you FISHED:



1 Region I
2 Region II
3 Region III
4 Region IV
9 I don't recall the region

The next questions inquire about how much you (and/or your travel group) spent in this trip to Costa Rica. Please report all expenditures in U.S. dollars. (Note: to convert colones into dollars, divide the colones by 500. For example, 1000 colones would equal 2 dollars):

12. Please report expenditures you made prior to departing on your fishing trip to the Costa Rica area. SURVEYOR: If the person did not purchase one or more of the following items prior to arriving in Costa Rica, please leave the box blank.

12.1 Package trips or tours:	$
12.2 Airfare (commercial airlines, not including air taxis to your fishing site):	$
12.3 Charterboats paid for in the US or outside of Costa Rica	$

12.4 Other travel-related purchases made prior to departing home.	$

Please estimate as well as possible the expenditures made while in Costa Rica. Please do not report any expenditures made outside of Costa Rica.

13.1 Gasoline, fuel and oil for your vehicle	$	
13.2 Taxi's, shuttle vans, etc to get to hotels, marinas, restaurants, etc.	$	
13.3 Charterboat fees, fishing guides	$	
13.4 Car rental (not including any fuel purchased)	$	
13.5 Boat rentals	$	
13.6 Lodging: please report the type of lodging used and the cost:	$	
13.7 Hotels/ Motels /Resorts:	$	
13.8 Timeshare (please only report the cost associated with your trip and not any part of the purchase price):	$	
13.9 Campgrounds	$	
13.10 Other (please specify):	$	
13.11 Restaurants, bars, carry-out food	$	
13.12 Groceries, food, liquor bought in stores (not in restaurants or bars)	$	
13.13 Ice	$	
13.14 Bait (natural bait only, such as mackerel and bait bought at the launch of chartered trips. Please do not include lures)	$	
13.15 Gifts & souvenirs of any type	$	
13.16 Entertainment and amusement/admission fees	$	
13.17 Fish processing & shipping:	$	
13.18 Taxidermy (only taxidermy fees paid to Costa Rica businesses, not U.S. taxidermists)		
13.19 Personal items (toiletries, medicine, etc.)	$	
13.20 Rods, reels, fishing tackle & misc related items (line, leaders, lures, hooks, sinkers, coolers, gloves, etc.)	$	
13.21 Other (except fishing and boating equipment which is the next question): _____	$	
13.22 How many people included this payment (include yourself)	$	

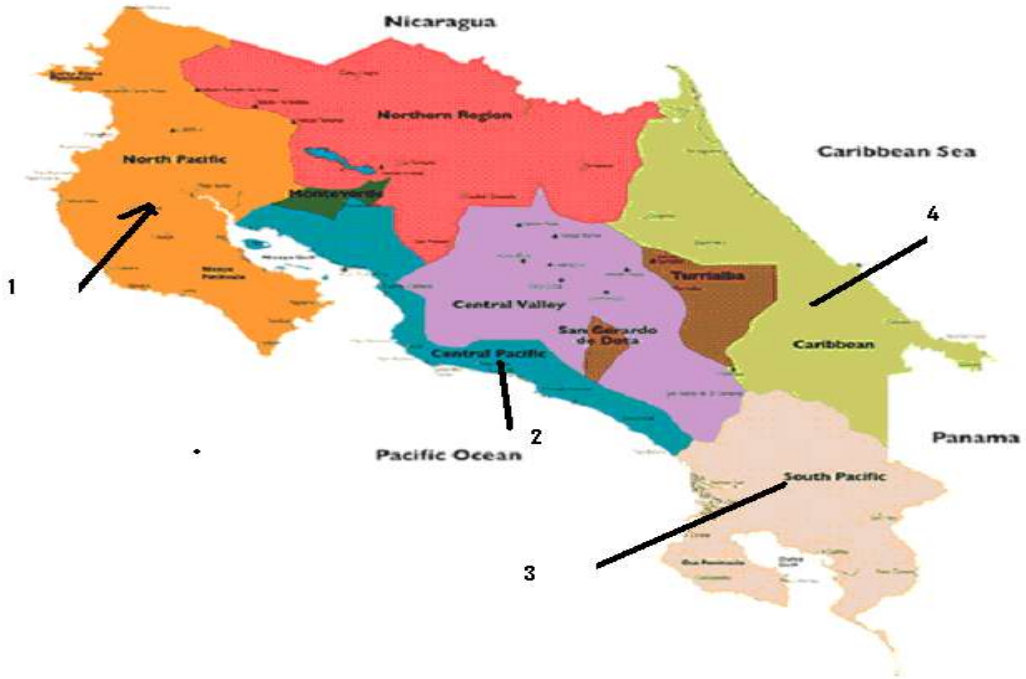
14 Do you own or maintain a boats in Costa Rica? 1 Yes 0 No

If YES, Please continue below.
If NO, continue question 15

Please estimate how much you spend annually to maintain your boat in Costa Rica.
Please report in U.S. dollars

14.1 Fuel	$	
14.2 Repairing & maintenance	$	
14.3 Captain & crew	$	
14.4 Accessories, furnishings	$	
14.5 Insurances, taxes	$	
14.6 Marina expenses (slip fees & maintenance only. Parts and items purchased are covered in the next & final expenditure question)	$	
Other _____ _____ _____		

15 Looking at this map, which regions did you visit?



SURVEYOR: Was the respondent a: 1 Male 2 Female
.COUNTRY: 1 US State 2 Canada

What was your total household income before taxes for last year?

Less than $20,000
$20,000 - $40,000
$40,000 - $50,000
$50,000 - $75,000
$75,000 - $100,000
$100,000 - $150,000
$150,000 - $250,000
More than $250,000

Appendix 5

QUESTIONNAIRE FOR HOTELS

Interviewer: "Good morning (afternoon, evening): The Billfish Foundation (TBF) in coordination with Instituto de Investigaciones en Ciencias Economicas de la Universidad de Costa Rica (I.I.C.E), is undertaking a study to learn about the socio-economic benefits derived from sportfishing tourism, determine the challenges the country faces in attracting anglers and other variables of interest, to help protect the environment and this activity.

Given your experience on the topic, we are asking you to provide information to help improve the state of knowledge. Any information you provide to us will be treated confidentially and the results will be analyzed solely in aggregate manner. The results of this study will be used to demonstrate to government authorities the importance of sportfishing to our economy.

PART I: IDENTIFICATION OF THE HOTEL

NAME	
ADDRESS	
Year Operations Started:	
Central Pacific ○ North Pacific ○ South Pacific ○ Caribbean ○ Entire Country ○	

TELEPHONE(S):	FAX:
WEB PAGE :_____	
E-MAIL:	

IDENTIFICATION OF INTERVIEWEE

Name of Person _____
Position in Company_____

Profession:_____ ☐ ☐ Sex: M F
Email:_____

Nationality:_____

RESULT OF INTERVIEW: ___ Complete

___ Incomplete
___ Rejected

1. The hotel is:

   1.___ An independent business

   2.___ Part of hotel chain National ____ International_____

   3.___ Other. Specify _____

2. ICT hotel rating (number of stars) _____

3. Total number of rooms _____

4. What are the high and low season months?

SEASON	**MONTHS**
High	
Low	

5. Is the hotel closed at any time of the year?

   1. No___ 2. Yes___ What months?_____

6. Rates **(the interviewer should bring from the hotel the rates by type of room in dollars at the time of the interview)**

SEASON	**ROOM**	
	Single and double	Others
High		
Low		

PART II: OCCUPATION, TOURISTS AND ANGLERS

7. What is your average occupation (as percentage of occupied rooms) in the high and low seasons?

SEASON	**AVERAGE OCCUPATION**
HIGH	
LOW	
No Answer	

8. Out of the total number of tourists staying at the hotel, what is the average stay in high and low season?

SEASON	**AVERAGE STAY (NUMBER OF DAYS)**
High	
Low	

No Answer	

9. Out of the total number of tourists staying at your hotel, what **PERCENTAGE** of them travel alone, accompanied by one more person, accompanied by two or more people, including family and/or friends?

SEASON	**PERCENTAGE**
Alone	
Accompanied by one more person	
Two or more people, including family and/or friends	
Total	**100%**
No Answer	

10. Out of every 100 tourists requiring your services in high season and low season, how many come ***EXCLUSIVELY*** to ***FISH?***

1. YES high season ___% low season____% 2. NO___No Answer__ ***(*****go to question # 12*****)***

11. What is the average stay (number of days) for ANGLERS in high season and low season?

SEASON	**NUMBER OF DAYS STAY**
High	
Low	
No Answer	

12. How many days do anglers **FISH PER WEEK** in high season and low season)?

SEASON	**NÚMBER OF DAYS**
High	
Low	
No Answer	

13. On average, how many **PEOPLE GO OUT FISHING WITH THE ANGLER** in high season and low season?

SEASON	**NUMBER OF PEOPLE**
High	
Low	
No Answer	

14. Of the total number of anglers, what percentage has their own fishing boat or yacht, what percentage rents or charters boat and what percentage takes a sportfishing tour?

ITEM	PERCENTAGE
Own boat or yacht	
Rent or charter boat	
Sportfishing tour	
TOTAL	**100 %**
No Answer	

15. Of anglers **WITHOUT OWN BOAT OR YACHT**, could you estimate how much they could be spending (in dollars) in **ONE DAY** in high season and low season?

ACTIVITY	**DAILY EXPENDITURE BY ANGLER WITHOUT OWN BOAT OR YACHT**	
	High Season	Low Season
Hotel		
Fishing activities (tours, charter boats, etc.)		
Other activities		
TOTAL		
No Answer		

16. How much does an angler **WITH OWN BOAT OR YACHT** spend daily in

ACTIVITY	**DAILY $ EXPENDITURE OF ANGLERS WITH OWN BOAT OR YACHT**	
	High Season	**Low Season**
Hotel		
Boat maintenance and operation		
Other activities		
TOTAL		
No Answer		

17. Of anglers coming exclusively to fish, how many come from

COUNTRIES	**PERCENTAGE OF TOURISTS**
United States	
Canada	
Europe	
Countries other than Costa Rica	
Costa Rica	
TOTAL	**100%**
No Answer	

PART III: INFORMATION ON ECONOMIC ACTIVITY OF HOTEL

Interviewer must say: “As I said before, any information provided will be strictly confidential for this project and will be used by The Billfish Foundation and the University to study the economic contribution of sportfishing to the country’s economy. All results will be aggregated estimates”.

STAFF

18. How many employees are there in the hotel in high season and low season?

SEASON	NUMBER OF EMPLOYEES
High	
Low	
No Answer	

19. What is the percentage distribution of payroll according to position in high season and low season?

TYPE OF STAFF	PAYROLL PERCENTAGE IN:	
	High Season	Low Season
Managers and Administrators		
Specialized staff (chefs, customer service –reception- and organization and trained in tourism)		
Non specialized staff (maids, guards, miscellaneous, drivers, etc.)		
Other		
TOTAL	**100%**	**100%**
No Answer		

PART IV: MARKETING AND ASSESSMENT OF THE AREA

20. Only for tourists who come **EXCLUSIVELY TO FISH.** What percentages contact your hotel by the following means?

CONTACT	PERCENTAGE
Direct contact	
All-inclusive package	
Referred by foreign company	
Referred by national company outside the region	
Referred by national company within the region	
Other companies with which have formed alliances	
Other Specify	
TOTAL	**100%**

21. How easy is it for you to find your main supplies in the area where your business is located?

1.__ Local availability allows changing operating volumes easily
2.__ Locally scarce which tends to make the cost structure more expensive
3.__ Some are available locally, others are scarce

22. Of all the employees, what percentage are from:

PLACE	PERCENTAGE OF EMPLOYEES	
	NATIONAL	FOREIGN
The area where the business is located		
Outside the area where the business is located		
TOTAL	**100%**	**100%**

23. Of the total expenditure in food and beverages, what percentage is purchased in the area where the business is located? _____%

24. Are there **local vendors** of food and beverages?

1. Yes How many? (Number of vendors)_____
2. No___ **(go to question 26**)
3. No Answer ___

25. What is your **expenditure (in dollars) <u>per month</u>** on all local vendors of food and beverages?

1. Yes How much?_____ 2. No___ 9.No Answer___

26. Are there **local vendors** of supplies, repairs, inputs and raw materials?

1. Yes How many? (Number of vendors)_____ 2. No___ (**go to question *28***) 3.No Answer__

27. What is your **expenditure (in dollars) <u>per month</u>** on all local vendors supplies, repairs, inputs and raw materials?

1. Yes How much?_____ 2. No___ 3.No Answer___

28. Taking into account ***ONLY ANGLERS*** using your services, could you estimate how many more anglers would require you **hire one more PERMANENT employee**?

1. Yes How many more anglers?_____ 2. No___ 9.No Answer

29. Taking into account ***ONLY ANGLERS*** using your services, could you estimate how many more anglers would require you **hire one more TEMPORARY employee**?

1. Yes How many more anglers?_____ 2. No___ 9.No Answer

PART V: INVESTMENT AND OPERATIONS

30. Can you tell how about total investments and expenses **LAST YEAR** (in high and low season) for the following items (in dollars or colones)?

ITEMS	**INVESTMENTS AND EXPENSES LAST YEAR**	
	COLONES	**DOLLARS**
1.- Staff and/or employees		
2.-Investment in **new** construction (buildings, facilities)		
3.- Investment in **new** vehicles		
4.- Investment in **new** furniture and equipment		

5.- Investment in **new** boats and fishing equipment		
6.-Other **new** investments		
7.-Facilities maintenance expenses (buildings)		
8.- Furniture and equipment maintenance expenses		
9.- Vehicle maintenance expenses		
10.- Boat and fishing equipment maintenance expenses		
11.-Other maintenance expenses		
12.-Operating expenses in food and beverage		
13.- Operating expenses in raw materials and supplies (fuels, etc.)		
14.-Utilities expenses (electricity, water, telephone, cable TV, Internet, advertising and promotion, other)		
15.-Municial and other permits		
16.-Income tax		
17.-Financial expenses (loans, interest)		
TOTAL		

31. Of the total for new investments or expenses for the following items, what was the percentage for national and imported goods?

ITEMS	**PERCENTAGE**		
	NATIONAL	**IMPORTED**	**TOTAL**
New investments in furniture and equipment, boats and fishing gear, new vehicles			**100%**
Maintenance expenses			**100%**
Food and beverage operating expenses			**100%**
Raw materials and supplies operating expenses			**100%**

32. Would you care to tell us what is the profit margin of your company? (income less expenses)

    1. YES___ PROFIT MARGIN_____% 9. No Answer_____

33. Could you tell us whether your margin is higher or similar to businesses like yours?

    1. HIGHER____ 2. SAME _____ 3. LESS_____ 9. No Answer_____

34. Could you tell us whether your margin is higher or similar to companies larger than yours?

    1. ES MAYOR____ 2. ES IGUAL _____ 3. ES MENOR_____ 9. No Answer_____

35. Could you tell us whether your margin is higher or similar to companies smaller than yours?

    1. HIGHER____ 2. SAME _____ 3. LESS_____ 9. No Answer _____

36. Of your total income, could you tell us the estimated percentages coming from:

ITEM	**PERCENTAGE OF INCOME**
Rooms	
Food and beverage	
Other activities	
Total	100%

37 Finally, and once again I will remind you that all information is confidential and very useful for the University in this study. Could you give us an estimate (in dollars) of the total income to the company last year?

    1. Yes___ How much?_____ 2. No___ 9.No Answer

THANK YOU VERY MUCH FOR YOUR ASSISTANCE

COMMENTS:_____
__

_____

_____

INTERVIEWER:_____
Date:_____ Time:_____

SUPERVISOR:_____
Date:_____

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CODIFIER:	Date:
DATA INPUT:	Date:

Appendix 6

QUESTIONNAIRE FOR BUSINESSES

Interviewer: "Good morning (afternoon, evening): The Billfish Foundation (TBF) in coordination with Instituto de Investigaciones en Ciencias Economicas de la Universidad de Costa Rica (I.I.C.E), is undertaking a study to learn about the socio-economic benefits derived from sportfishing tourism, determine the challenges the country faces in attracting anglers and other variables of interest, to help protect the environment and this activity.

Given your experience on the topic, we are asking you to provide information to help improve the state of knowledge. Any information you provide to us will be treated confidentially and the results will be analyzed solely in aggregate manner. The results of this study will be used to demonstrate to government authorities the importance of sportfishing to our economy.

PART I: IDENTIFICATION OF THE BUSINESS

NAME	
ADDRESS	
Year Operations Started:	
Central Pacific North Pacific South Pacific Caribbean Entire Country	

TELEPHONE (S):	FAX:
WEB PAGE :_____ CORREO ELECTRONICO:	

IDENTIFICATION OF INTERVIEWEE

Name of Person _____
Position in Company_____

Profession:_____ Sex: H ___ M____
Email _____
Nationality:_____
__

RESULT OF INTERVIEW: ___ Complete
___ Incomplete

___ Rejected

37. Your company is:

1.___ An independent business
2.___ Part of a national chain
3. ___ Part of a national chain
4.___ Other. Specify _____
9.___No Answer

38. Could you describe the activities of the company?

ACTIVITY	**ANSWER**
Sportfishing Tour Operator	
Sportfishing boat charter and rental	
Sale of sportfishing equipment	
Restaurant	
General tour operator and tourist packages	
Other (specify)	

39. Please describe how dependent your business is on tourism?

1.__Very dependent (Couldn't survive without it)
2.__Somewhat dependent
3.__Not very dependent on tourism
4.__Not dependent at all on tourism

40. Please describe how dependent your business is on sportfishing?

1.__Very dependent (Couldn't survive without it)
2.__ Somewhat dependent
3.__ Not very dependent on sportfishing
4.__ Not dependent at all on sportfishing

PART II: USE, TOURISTS AND ANGLERS

41. What are the high and low season months?

SEASON	**MONTHS**
High	
Low	

42. Is the business closed at any time of the year?

2. No___ 2. Yes___ What months?_____

43. How many tourists require your services **IN ONE DAY**:

SEASON	**DAILY AVERAGE OF**

	TOURISTS
High	
Low	

44. How many tourists visiting ***EXCLUSIVELY*** for sportfishing require your services **IN ONE DAY**:

SEASON	**DAILY AVERAGE OF ANGLERS**
High	
Low	

45. For every 100 tourists requiring your services in high season and low season, could you tell me how many (number) come ***EXCLUSIVELY TO FISH?***

2. YES high season _____% low season_____% 2. NO_____ No Answer_____

46. Of the total number of anglers, what percentage has their own fishing boat or yacht, what percentage rents or charters boat and what percentage takes a sportfishing tour?

ITEM	PERCENTAGE
Own boat or yacht	
Rent or charter boat	
Sportfishing tour	
TOTAL	**100 %**
No Answer	

47. Of anglers **WITHOUT OWN BOAT OR YACHT**, could you estimate how much they could be spending (in dollars) in **ONE DAY** in high season and low season?

ACTIVITY	**DAILY $ EXPENDITURE OF ANGLERS WITHOUT OWN BOAT OR YACHT**	
	High Season	**Low Season**
Hotel		
Fishing activities (tours, boat rental, etc.)		
Other activities		
TOTAL		
No Answer		

48. How much does an angler **WITH OWN BOAT OR YACHT** spend daily in

ACTIVITY	**DAILY $ EXPENDITURE OF ANGLERS WITH OWN BOAT OR YACHT**	
	High Season	**Low Season**
Hotel		
Boat maintenance and		

operation		
Other activities		
TOTAL		
No Answer		

49. Of anglers coming exclusively to fish, how many come from

COUNTRIES	**PERCENTAGE OF TOURISTS**
United States	
Canada	
Europe	
Countries other than Costa Rica	
Costa Rica	
TOTAL	**100%**
No Answer	

PART III: INFORMATION ON ECONOMIC ACTIVITY OF BUSINESS

Interviewer must say: "As I said before, any information provided will be strictly confidential for this project and will be used by The Billfish Foundation and the University to study the economic contribution of sportfishing to the country's economy. All results will be aggregated estimates".

STAFF

50. How many employees are there in the hotel in high season and low season?

SEASON	**NUMBER OF EMPLOYEES**
High	
Low	
No Answer	

51. What is the percentage distribution of payroll according to position in high season and low season?

TYPE OF STAFF	**PAYROLL PERCENTAGE IN:**	
	High Season	High Season
Managers and Administrators		
Specialized staff (chefs, customer service – reception- and others trained in tourism)		
Non specialized staff (maids, guards, miscellaneous, drivers, etc.)		
Other		

TOTAL	**100%**	**100%**
No Answer		

PART IV: MARKETING AND ASSESSMENT OF THE AREA

52. Only for tourists who come **EXCLUSIVELY TO FISH.** What percentages contact your business by the following means?

CONTACT	**PERCENTAGE**
Direct contact	
All-inclusive package	
Referred by foreign company	
Referred by national company outside the region	
Referred by national company within the region	
Other companies with which have formed alliances	
Other Specify	
TOTAL	**100%**

53. How easy is it for you to find your main supplies in the area where your business is located?

1.__ Local availability allows changing operating volumes easily
2.__ Locally scarce which tends to make the cost structure more expensive
3.__ Some are available locally, others are scarce

54. Of all the employees, what percentage are from:

PLACE	**PERCENTAGE OF EMPLOYEES**	
	NATIONAL	**FOREIGN**
The area where the business is located		
Outside the area where the business is located		
TOTAL	**100%**	**100%**

55. **ONLY FOR RESTAURANTS.** Of the total expenditure in food and beverages, what percentage is purchased in the area where the business is located? _____%

56. Are you a direct supplier to hotels catering to anglers?

1. Yes Number of hotels _____ 2. No___ (***go to question*** #_) 9. No Answer

57. Of your total income, what percentage comes exclusively from supplying hotels catering to anglers? Use the following ranges:

RANGE	**INDICATE**
100%	
75-100%	
50-75%	
Less than 50%	

58. Are there **local vendors** of food and beverages?

1. Yes How many? (Number of vendors)_____
2. No___ **(go to question** _)
3. No Answer ___

59. What is your **expenditure (in dollars) <u>per month</u>** on all local vendors of food and beverages?

1. Yes How much?_____ 2. No___ 9.No Answer___

60. Are there **local vendors** of supplies, repairs, inputs and raw materials?

1. Yes How many? (Number of vendors)_____ 2. No___ (**go to question *#26***) 3.No Answer___

26. Could you tell us how much is the total **expense (in Dollars) <u>per month</u>** in local suppliers of supplies, inputs, repairs and raw materials?

1. Yes How much did you spend?_____ 2. No___ 9.No Answer__

27. Taking into account ***ONLY ANGLERS*** using your services, could you estimate how many more anglers would require you **hire one more PERMANENT employee**?

1. Yes How many more anglers?_____ 2. No___ 9.No Answer

28. Taking into account ***ONLY ANGLERS*** using your services, could you estimate how many more anglers would require you **hire one more TEMPORARY employee**?

1. Yes How many more anglers?_____ 2. No___ 9.No Answer

PART V: INVESTMENT AND OPERATIONS

29. Can you tell how about total investments and expenses **LAST YEAR** (in high and low season) for the following items (in dollars or colones)?

30.

ITEMS	**INVESTMENTS AND EXPENSES LAST YEAR**	
	COLONES	**COLONES**
1.- Staff and/or employees		
2.-Investment in **new** construction (buildings, facilities)		
3.- Investment in **new** vehicles		
4.- Investment in **new** furniture and equipment		
5.- Investment in **new** boats and fishing equipment		

6.-Other **new** investments		
7.-Facilities maintenance expenses (buildings)		
8.- Furniture and equipment maintenance expenses		
9.- Vehicle maintenance expenses		
10.- Boat and fishing equipment maintenance expenses		
11.-Other maintenance expenses		
12.-Operating expenses in food and beverage		
13.- Operating expenses in raw materials and supplies (fuels, etc.)		
14.-Utilities expenses (electricity, water, telephone, cable TV, Internet, advertising and promotion, other)		
15.-Municial and other permits		
16.-Income tax		
17.-Financial expenses (loans, interest)		
TOTAL		

31. Of the total for new investments or expenses for the following items, what was the percentage for national and imported goods?

	PERCENTAGE		
ITEMS	**NATIONAL**	**IMPORTED**	**TOTAL**
New investments in furniture and equipment, boats and fishing gear, new vehicles			100%
Maintenance expenses			100%
Food and beverage operating expenses			100%
Raw materials and supplies operating expenses			100%

32. Would you care to tell us what is the profit margin of your company? (income less expenses)

2. YES___ PROFIT MARGIN _____% 9. No Answer_____

33. Could you tell us whether your margin is higher or similar to businesses like yours?

2. HIGHER____ 2. SAME _____ 3. LESS _____ 9. No Answer_____

34. Could you tell us whether your margin is higher or similar to companies larger than yours?

    2. HIGHER____ 2. SAME _____ 3. LESS _____ 9. No Answer_____

35. Could you tell us whether your margin is higher or similar to companies smaller than yours?

    2. HIGHER____ 2. SAME _____ 3. LESS _____ 9. No Answer_____

36. Finally, and once again I will remind you that all information is confidential and very useful for the University in this study. Could you give us an estimate (in dollars) of the total income to the company last year?

    1. Yes___ TOTAL INCOME?_____ 2. No___ 9.No Answer

THANK YOU VERY MUCH FOR YOUR ASSISTANCE

COMMENTS:_____
_____

INTERVIEWER:_____
Date:_____ Time:_____

SUPERVISOR:_____
Date:_____

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CODIFIER:	Date:
DATA INPUT:	Date: