

FOSTERING THE WORK OF THE IOTC WITH SOCIO-ECONOMIC DATA SETS SOURCED FROM FAO-GLOBEFISH AND THE PACIFIC ISLANDS FORUM FISHERIES AGENCY (FFA)

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Introduction

The [Agreement](#) for the establishment of the Indian Ocean Tuna Commission (IOTC) states that the Commission shall “keep under review the economic and social aspects of the fisheries based on the stocks covered by this Agreement bearing in mind, in particular, the interests of developing coastal states.”

To collate data on the socio-economics of the tuna and tuna-like fisheries of the Indian Ocean, the IOTC Secretariat has developed in 2014 the reporting [Form 7PR](#) which CPCs can use to voluntarily report prices of fish per type of product and market for the target species of Indian Ocean tuna and tuna-like species. In addition, the IOTC encourages the reporting of information on the socio-economic dimension of tuna and tuna-like fisheries at national level, with indicators describing for instance the contribution to the Gross Domestic Product and the number of jobs in the fisheries and post-harvest sector.

To date, very little information on the socio-economics of tuna and tuna-like fisheries has been reported to the Secretariat with the notable exception of time series of monthly prices by species, fishing gear, and area reported by Oman since 2005. In 2021, the IOTC Secretariat has started a collaboration with the team of the [GLOBEFISH](#) project at FAO and the Fisheries Development Division of the Pacific Islands Forum Fisheries Agency ([FFA](#)) who already collate and analyse socio-economic data available at national, regional, and global levels for the monitoring of tuna fisheries and markets, and the dissemination of information to support sustainable exploitation and use of tuna resources.

The objective of this document is to inform the participants of the WPDCS17 on the data that can be collated on the socio-economics of tuna fisheries through international collaborations and assess the interest of these new sources of information for the work of the IOTC.

Materials

FAO Tuna Price Index

The Tuna Price Index (TPI) is the tuna component of the FAO fish price index derived from seafood trade statistics in the EU, US, and Japan which are considered to be highly representative of the global seafood trade (Tveterås et al. 2012). Specifically, the sources of the raw data for the TPI are [EUMOFA](#), [INFOFISH](#), [INFOPECSA](#), [INFOYU](#), and [Statistics Norway](#). The TPI is considered to be representative of the tuna seafood species group, including albacore (*Tunnus alalunga*), bigeye tuna (*Thunnus obesus*), bonito, bluefin tunas (*Thunnus thynnus* and *T. orientalis*), skipjack (*Katsuwonus pelamis*), southern bluefin tuna (*Thunnus macoyii*), yellowfin tuna (*Thunnus albacares*), and other tunas species (e.g., *Auxis spp*). The monthly time series of the TPI starts in January 1990 and is expressed relative to the years 2014-2016 in base 100.

FFA indices

The fisheries development division of the FFA has been collating monthly time series of tuna price data on key markets to use them as indicators of the trends in the price received by operators:

- [Import prices in Thailand](#) for yellowfin tuna, skipjack tuna, and albacore tuna caught with purse seine and stored frozen (USD/t; 2000-2020);
- [Import prices in Japan](#) from Oceania for yellowfin tuna and bigeye tuna caught with longline and stored on ice (fresh) (yen/kg; 2000-2020) ;
- Import prices in the USA from Oceania for yellowfin tuna, bigeye tuna, and albacore caught with longline and stored on ice (fresh) (USD/kg; 2000-2020);
- [Import prices in Japan](#) for yellowfin tuna and bigeye tuna caught with longline and stored frozen (ultra-low temperatures of about -60°C) (yen/kg; 2000-2020).

Fish prices not available in USD were converted using the exchange rate prevailing during the relevant time period and adjusted for inflation using US Consumer Price Index data to obtain real prices (Ruaia et al. 2020). These time series are considered more representative of trends in tuna price than the prices received by operators (i.e., ex-vessel prices) which may strongly depend on the markets and transport costs (Ruaia et al. 2020).

In addition, the FFA has been collating the [average crude oil spot price](#) (COS) which is computed as the equally weighted price of the West Texas Intermediate Crude Oil Price, Brent Crude Oil Price, and Dubai Crude Oil Price (USD/barrel; 2000-2020) and used as an indicator of the fisheries costs, assuming that real non-fuel fishing costs have remained constant over time (Ruaia et al. 2020).

Overview of the FFA time series

The ten time series of price of tuna collated by the FFA describe the main tuna markets of the world which are supplied by longline and purse seine fisheries of the Atlantic, Indian, and Pacific Oceans. The value of the tuna is directly dependent on the fishing gear used, handling practices, and food preservation method. Tuna caught with purse seine is mostly for the low-value canning market when tuna caught with longline targets the high-value sashimi market (**Fig. 1**).

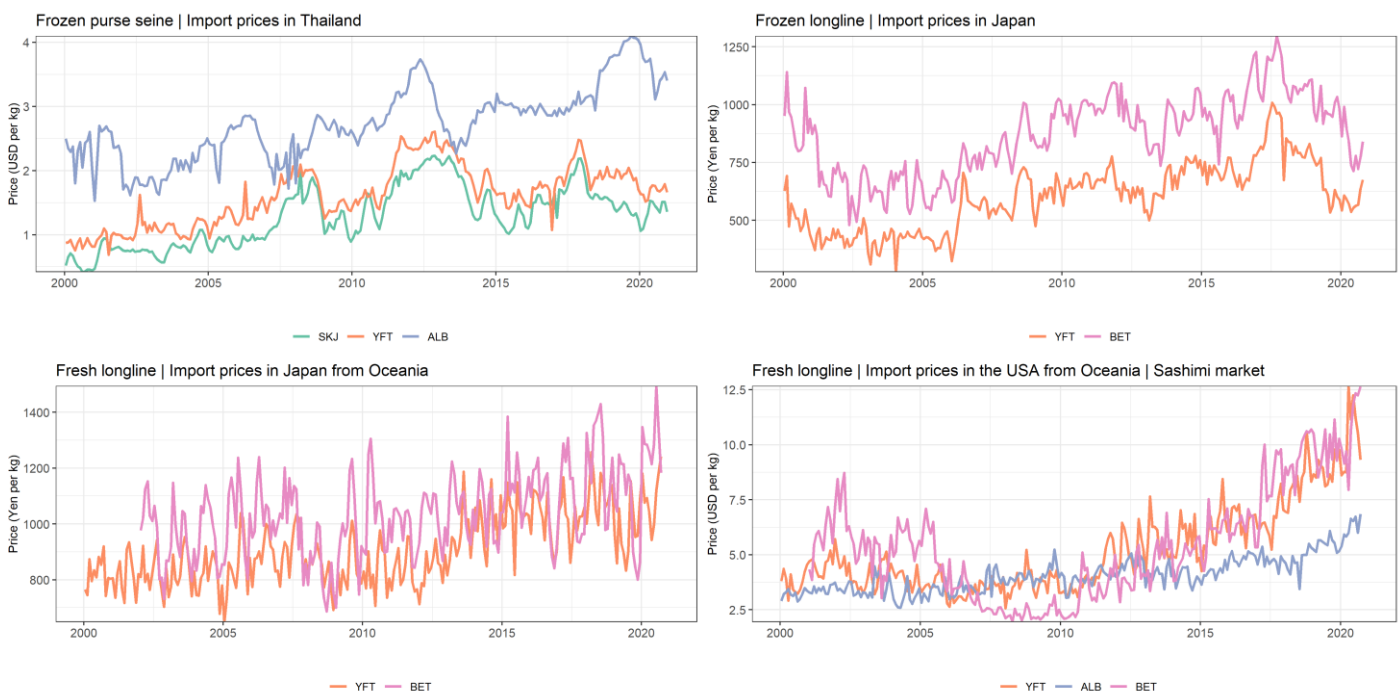


Figure 1: Monthly time series of price of (top-left) frozen skipjack (SKJ), yellowfin (YFT) and albacore (ALB) tunas caught with purse seine and imported in Thailand, (top-right) frozen bigeye and yellowfin tunas caught with longline and imported in Japan, (bottom-left) fresh bigeye and yellowfin tunas caught with longline and imported in Japan, and (bottom-right) fresh bigeye, yellowfin, and albacore tunas caught with longline and imported in the USA, during the period 2000-2020

Comparison of TPI with FFA series

The TPI and import price in Thailand of yellowfin tuna caught with purse seine show very similar temporal trends between 2000 and 2020 (**Fig. 2**). The two time series show an increasing trend from 2000 to 2013 followed by a major decline until 2016 and a re-increase thereafter. By contrast, the TPI is less in agreement with the time series of price for tuna caught with longline and destined to the high-value sashimi markets of Japan and the USA.

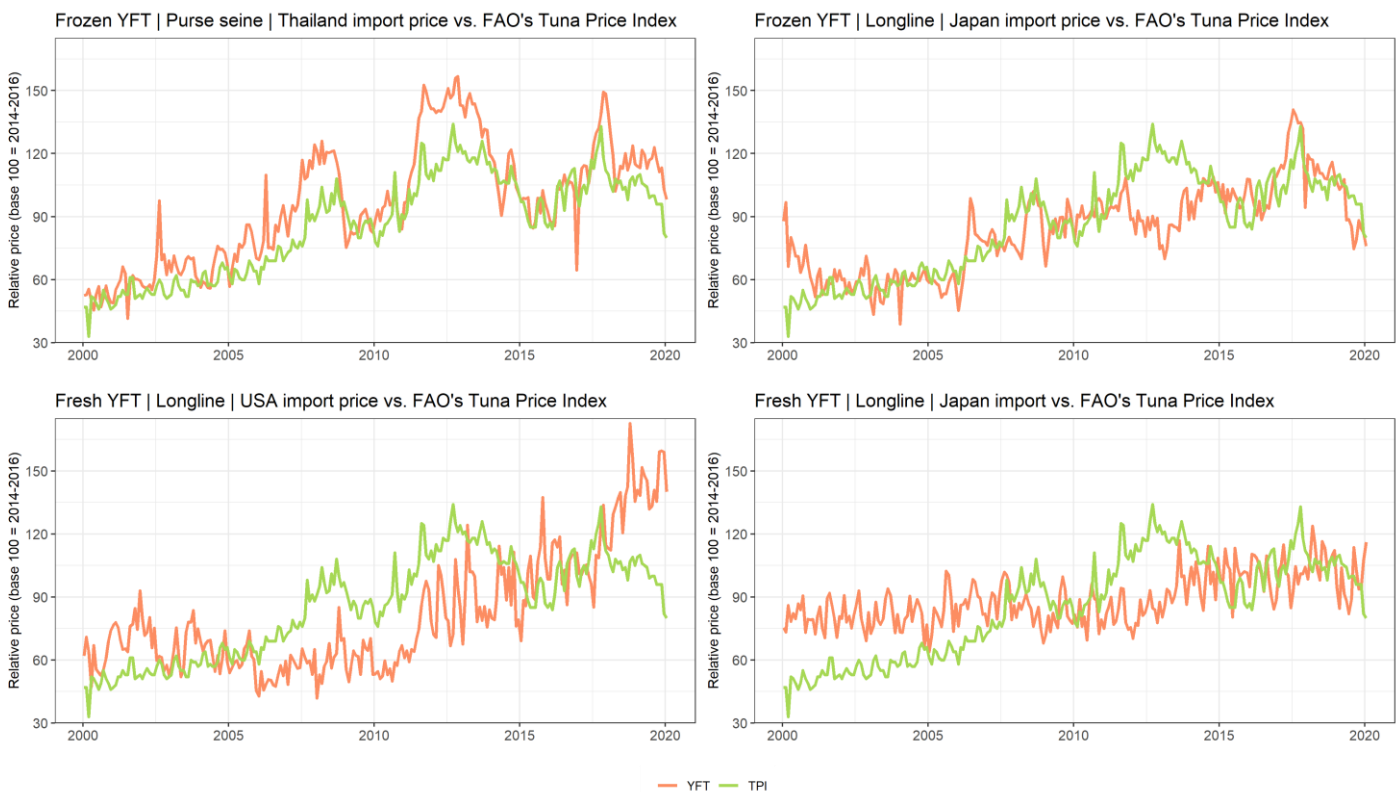


Figure 2: Monthly time series of the FAO's Tuna Price Index (TPI) and relative import prices of frozen and fresh yellowfin tuna (YFT) caught with purse seine and longline during the period 2000-2020

Crude fuel spot price

The values of tuna and fuel appear to be strongly linked at global scale. The TPI showed large fluctuations between 2000 and 2020 that appear strongly correlated with the value of fuel derived from the crude fuel spot price (**Fig. 3**). The value of fuel substantially increased from about 25 USD per barrel in the early 2000s to more than 130 USD per barrel in 2008 before crashing down to about 40 USD per barrel after the global financial crisis, which destroyed the demand for energy. Fuel price then re-increased rapidly to reach a plateau at more than 100 USD per barrel between 2011 and 2014. Between mid-2014 and early 2016, the global economy faced another large oil price decline due to the growing role of the U.S. shale oil industry, a shift in the policy of the Organization of the Petroleum Exporting Countries (OPEC), a reassessment of geopolitical risks, and deteriorating global growth prospects (Anonymous 2018). Since 2016, fuel price has shown an increasing trend marked by large variability (**Fig. 3**).

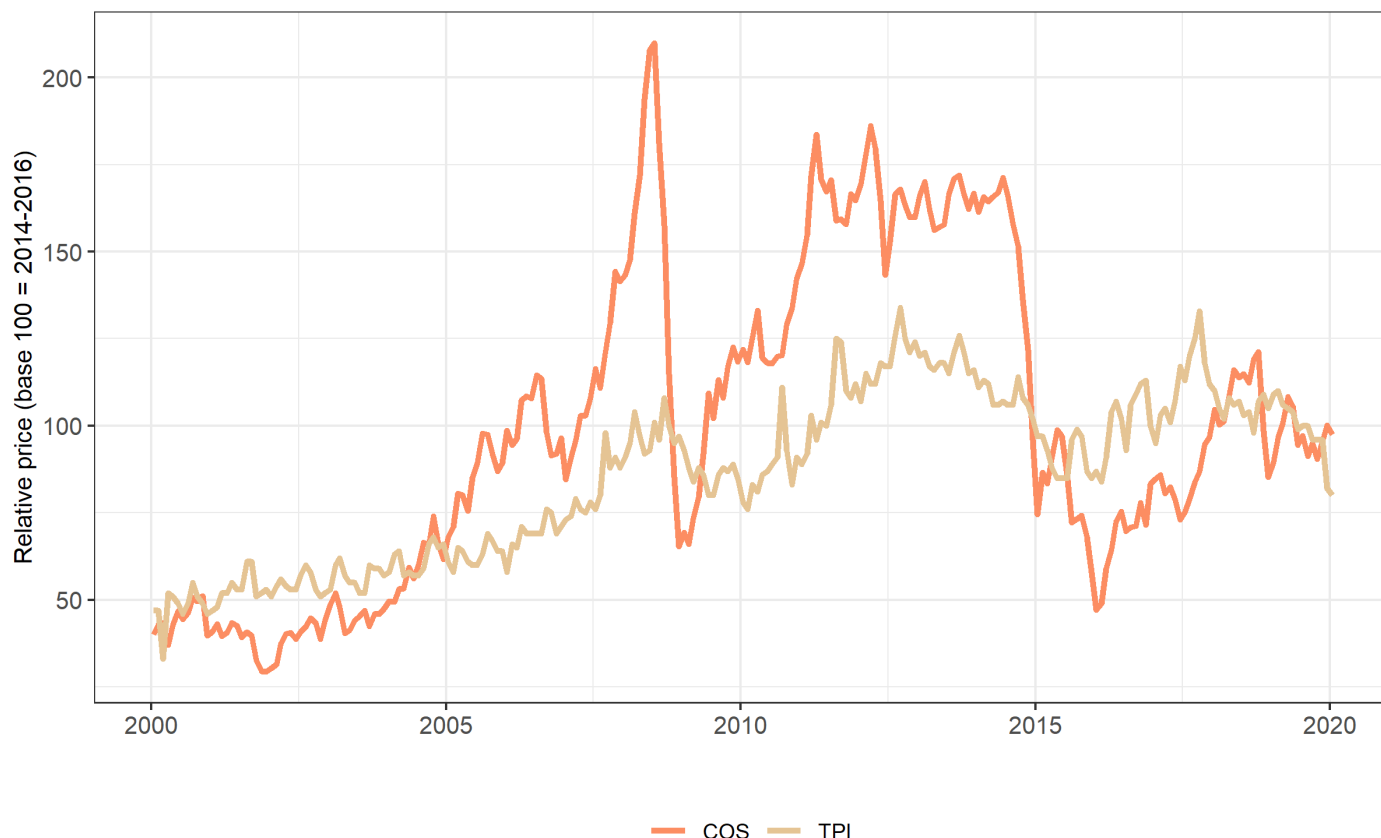


Figure 3: Monthly time series of the crude oil spot price (COS) and the Tuna Price Index (TPI) during the period 2000-2020

Conclusions

Regarding the global dimension of the tuna market (Guillotreau et al. 2016), time series of tuna derived from international trade statistics and crude fuel spot prices can provide useful information on the economic drivers of the fisheries targeting tuna and tuna-like species in the Indian Ocean. The FFA uses these data to derive economic and development indicators (e.g., market conditions) from estimates of fishing costs, catch rates, and price and provide economic advice for its members in the Western central Pacific Ocean (Ruaia et al. 2020).

In addition, the GLOBEFISH project holds some other data sets on international trade (imports and exports in value) of processed and unprocessed tuna by destination, GDP, and on employment in fisheries and fisheries-related sectors (e.g., post-harvest) that could be of interest to the work of the IOTC.

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