MARKET POWER AND THE EUROPEAN TUNA OLIGOPSONY: IMPLICATIONS FOR FISHERIES AND TRADE

Patrice Guillotreau, Institut de Recherche pour le développement (IRD), patrice.guillotreau@ird.fr

Rémi Mongruel, IFREMER, France

Ramon Jiménez-Toribio, Universidad de Huelva, Spain

ABSTRACT

Some recent studies have shown the outstanding price linkages at the global scale between the cannery-grade tuna markets over the last decade. When it comes to price transmission along the European value chains, opposite results between the two major species (skipjack and yellowfin) are found: the market for final goods is actually segmented between the northern European countries consuming low-priced skipjack imported from Asia and the southern countries producing and importing yellowfin sold on their domestic markets at higher prices. If the former market is supposedly competitive, there is more suspicion of market power exercised on the latter. Through a structural and dynamic I.O. model already tested for other species in previous research, this paper explores the possible existence of market power exercised either by processors on the one hand (canned tuna sold in France) and/or by retailers on the other (French supermarkets). Some explanations are given in terms of industrial concentration for both processing and retailing industries and the marketing organisation itself. The high level of trade barriers protecting the European industry may also serve as a determining factor.

Keywords: canned tuna market, concentration, market power

1. Introduction: the limits to tuna markets integration

In a previous research (Jimenez-Toribio *et al.*, 2007), we have tested for price relationships between the European and the world markets both horizontally (spatial linkages at the ex-vessel and the ex-cannery levels) and vertically (price transmission). First of all, a very high degree of market integration was found on the first-hand market (frozen tuna) at the world-wide level for the two major species (skipjack and yellowfin) used by the canning industry. Some of the processors are big multinational firms comparing in real time ex-vessel prices on a limited number of market places (Thailand, Ecuador, American Samoa, Japan, Italy, Côte d'Ivoire, Spain). These results are in line with other attempts of looking at price linkages between tuna markets (Jeon *et al.* 2008, Squires *et al.* 2006), except that they go further by showing a linkage between the two species that was never found previously.

But as regards canned tuna products, the European market is dual. The skipjack in oil or brine, conventionally consumed in the North European countries, offers a clear picture of competitive market ruled by imports from Thailand that are able to jump over the 24% custom tariff. This result is consistent with other studies showing through an AIDS model for canned tuna in the UK for instance the good (and negative) response of expenditure to prices between different product medium (brine, sauce, oil) (Jaffry and Brown, 2005; Josupeit 1993). Moreover, the US demand has probably the greatest influence on global markets through their huge imports from Asian countries, thus creating a linkage with the European market also importing from this important source of supply. As far as the canned yellowfin is concerned, all horizontal and vertical price relationships estimated at the final stages of the marketing chain gave opposite conclusions: no co-movements in the long run, no causality and a rather bad transmission of price changes, except on the ex-vessel market segment. These results lead to a suspicion of market power for yellowfin tuna products consumed in Europe.

A long time ago, industrial organisation scientists found an origin of market power in the level of concentration reached by an industry. Actually, the European markets for canned tuna are now dominated by a handful of powerful traders, processors and retailers. In the second section, the degree of concentration of the European canned tuna industry is thus estimated, before looking at gross margins as a proxy of the Lerner index which raises suspicions of market power in this industry. In a third section, a dynamic structural model inspired by Steen and Salvanes (1999) is developed and tested on the French market for canned yellowfin in brine (quarterly data between 1995 and 2006). The results provide evidence of market power after a breakpoint in 1998, date of several events (ENSO effects, low prices of frozen tuna, devaluation of the Thailandese Baht, increasing quantity of tuna loins processed by canneries…). In the fourth and last section, the consequences of this market power are discussed in terms of fisheries management and tuna trade.

2. Concentration of the European canned tuna market: evidence from structural data

Increasing returns to scale and intra-industry trade of tuna products

A market power is likely to occur in an industry dominated by a few big enterprises which are able to reinforce market imperfections (entry barriers, economies of scale) through a wide range of rival-oriented strategies (warfare, entry deterrence, price discrimination, raising rivals' costs...). Since the very inception of the tuna industry nearly two centuries ago in Europe, most of the comparative advantages in the canned fish trade have been based on the closeness of fisheries (sardines, and then tuna) and low labour costs. With the growing market share of tropical tuna in the global market of these products, comparative advantages are now more rooted in increasing returns to scale than anything else. As an example, the French industry, which pioneered the world fish canning industry and exported 70% of it output to the USA until the mid-19th century to supply the gold rush (Guillotreau and Ferreira Dias 2005), has experienced a huge decrease in the number of canneries since World War II. Not only most of the plants were settled in the former African colonies after the discovery of the tropical tuna stocks in the Atlantic Ocean, but the remaining canneries in France rapidly merged and concentrated and were taken over by multinational groups (figure 1). The level of production and trade increased steadily during this concentration process, foreign trade of canned tuna being narrowly embedded in the multinational corporate strategies (fish caught by French vessels and landed in a foreign country where some French companies have processing units or portfolio investments becomes a French export to this country and the processed fish that is shipped to France is accounted for an import). This evolution is well known in the theoretical literature of international trade which explains the high level of intra-industry trade by increasing returns to scale (Brander and Krugman 1983), although the tuna trade in Europe is rather vertically segmented (exports of raw tuna, imports of canned tuna).

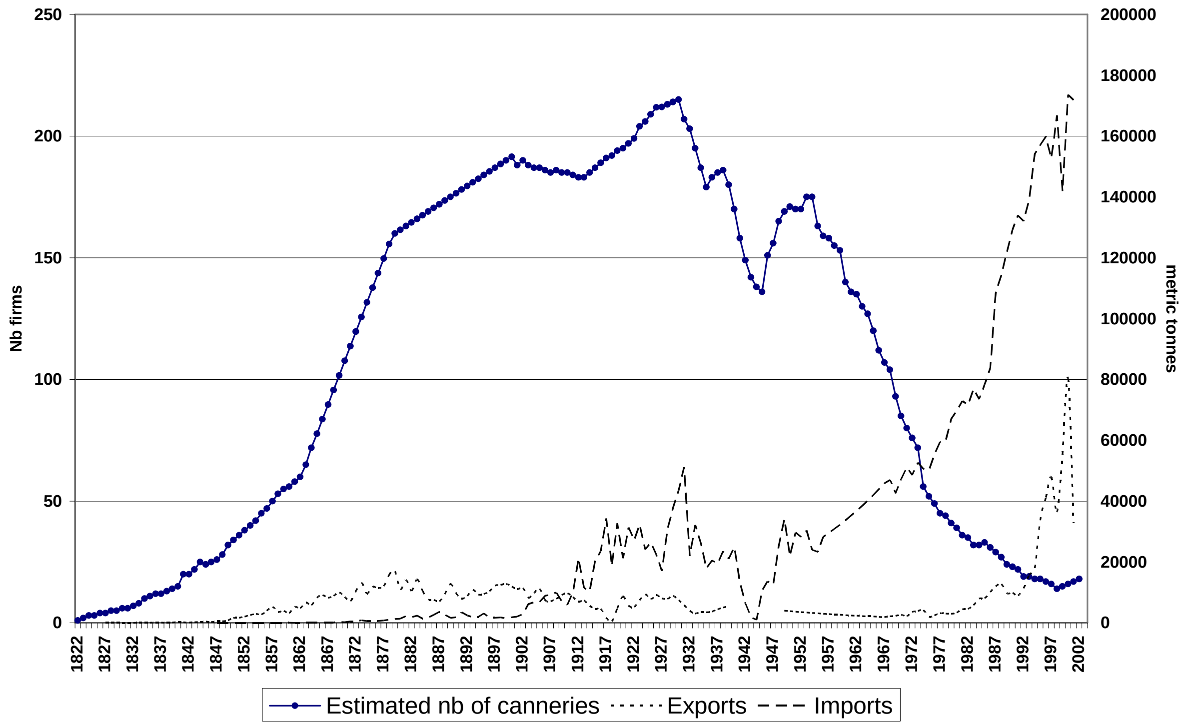

Figure 1. Number of canneries and trade in France since 1822

(Guillotreau and Ferreira Dias, 2005)

In the US, the canned tuna industry, developed at the beginning of the 20th century in California, had to face the 'low-cost competition' initiated in the 1970s by Japan and followed by Thailand an other Asian countries. It has been forced to move the bulk of its production either in the US territories of American Samoa and Puerto Rico, where minimum wages are lower than in US mainland, or to South East Asian suppliers: as a result, since 1979, 11 canneries based in the US and its overseas possessions have closed (Campling *et al.* 2007).

Concentration and suspicion of market power for the canned yellowfin market

Like many other old industries, the worldwide tuna market is now hold by a few big Multinational Firms (MNF) surrounded by a competitive fringe. On the basis of exhaustive data available in 2003, we have assessed the concentration degree of the sector. The market shares in quantity were estimated as follows: firstly, different sources (Oceanic Development *et al.* 2005, Campling *et al.* 2007, Globefish and Seafood International) were used to reconstitute the world industry structure (production by firms), and secondly, national and international production and trade statistics were collected and distributed proportionally among the firms in order to assess the concentration of regional markets. Finally, this world-covering estimate was cross-checked and found consistent with partial market concentration estimates from professional sources and the grey literature.

At the global level, the processing capacity of the major firms is tremendous and the five leaders concentrate nearly half of the world market for canned tuna. As reported previously, this important concentration level is due to the increasing returns to scale on all segments of the supply chain. Tuna is a migratory species and fishing for it requires a tremendous amount of investment, as shown by the increasing size of purse-seiners around the world. The trading of tuna products, now dealing with big retailing chains and processors, also require large-scale operators. And this is the case too for canning for which globalisation has extended the size of markets, thus increasing the marketing and transportation costs. The induced fixed costs are therefore large enough to justify mergers and acquisitions by the leaders of the tuna industry so as they can reduce their average production costs and transfer the cost reduction down to the consumer. This global level of concentration must also be further analyzed at the regional level by considering separately EU and the USA, the two major canned tuna markets in the world. The results show that the concentration is greater in the USA, where the three leading companies hold 75% of the market in volume; in value, the market share of the 'big three' may rise up to 85%. But in Europe, even when considered globally, sales in volume on the canned tuna EU market are already highly concentrated (figure 2): the five leading companies (*Trinity Alimentary*, *Star Kist*, *Isabel Garavilla*, *Salica Albacora* and *Jealsa*) hold 50% of the market in volume and the ten leading companies 72%.

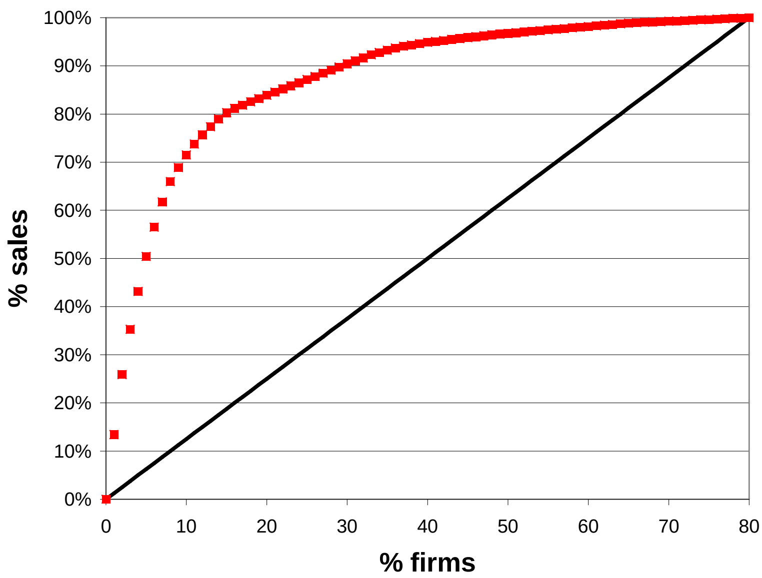

Figure 2. The European canned tuna oligopoly (cumulated sales by firms in tons, 2003)

Source: own estimates from Eurostat, Oceanic Development 2005, Campling *et al.* 2007

The reasons for such an oligopoly are twofold. First of all, the leading firm[i] benefits from a preferential trade regime which favours both the re-imports of canned tuna processed by their subsidiary plants delocalised in African-Caribbean-Pacific (ACP) countries and using raw materials supplied by the European fleets with which they may have investment relationships. Indeed, three specific trade rules protect the European industry: i) the compensatory allowance for tuna (CAT) guarantees a minimum revenue to the fishing companies supplying the European-based canning industry whatever the international raw-tuna prices, ii) the common tariff protects European processing firms from global world competition with a 20.5 or 24% tariff rate on canned tuna, and iii) the EU preferential trade tariffs[ii], which includes a rule of origin imposing the use of raw materials supplied either by the beneficiary countries or by European producers (Campling *et al.* 2007, Mongruel 2002, Kaczynski and Fluharty 2002).

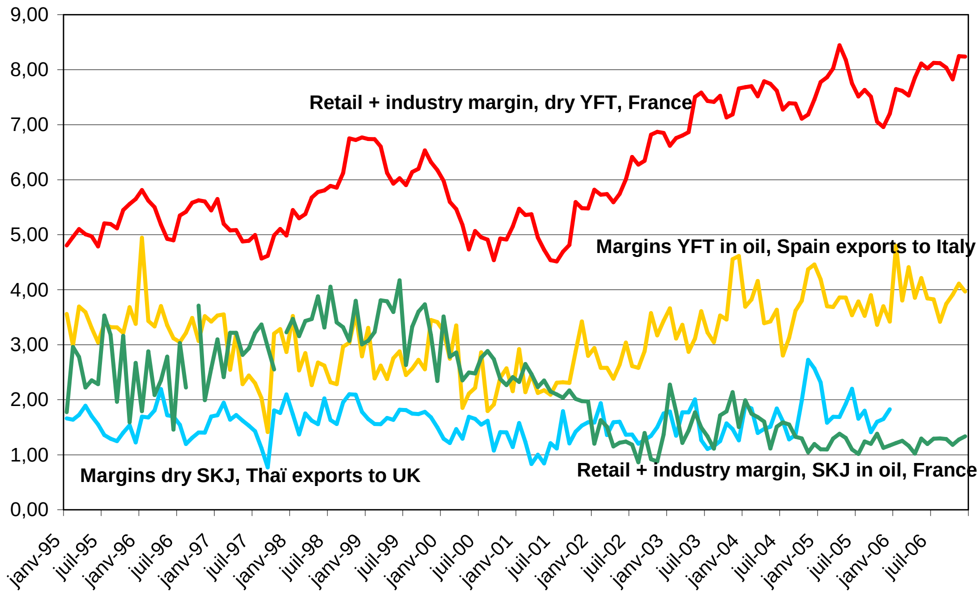

Figure 3. Gross margins of various European canned tuna supply chains.

Source: our estimates after data by Ofimer-SECODIP, Eurostat, Orthongel and SPC-FFA.

Secondly, the European processing firms have adopted product differentiation strategies based on their well-established national brands, and eventually developed special recipes to create captive consumer preferences. Although canned tuna is widely viewed as a basic commodity[iii], demand elasticities can be lower for domestic products than for imported ones (Babula and Corey 2005), while product differentiation can ensure price premiums (Payne 1994). The gross margins, estimated by the difference between the price of canned tuna and that of frozen tuna, are much higher for yellowfin-based products sold in France and in Italy than for skipjack-based products sold in the UK as well as in Spain (figure 3). Thus, the strong processing oligopoly in the European Union, even showing a monopoly position in some of the member states, has certainly imposed yellowfin-based differentiated products on the southern markets ("*atun claro en escabeche*", "*thon albacore au naturel*", tuna salads…) that may enjoy better pricing. In other words, if the concentration of the market is relatively high and the consumer's preference for national products is stimulated by major brands' reputation, the domestic industry is likely to exercise market power on either retailers or consumers.

In the EU, the market for final goods is assumed to be segmented between the Northern European countries consuming low-priced products imported from Asia (mainly Thailand) and the Southern countries (Italy, Spain) processing and importing yellowfin-based products sold on their domestic markets at higher prices, France being an intermediate market where both products are consumed. If the former market is supposedly competitive, there is more suspicion of market power exercised on the latter. The aim of the following part of the paper is to search for econometric evidence of this market power, based on the case of the French canned yellowfin market.

3. A dynamic structural IO Model applied to the French canned yellowfin market

The theoretical model and data

A way of testing for market power is to look at price movements after a rotation and shift of the demand curve (Steen and Salvanes 1999, Jaffry *et al.* 2003), following a structural IO model.

The demand side may be described by:

$$Q = D(P, Z; \alpha) + \varepsilon \qquad (1)$$

where *Q* is the quantity of canned tuna in brine consumed by French households in supermarkets mainly, *P* is the price of canned tuna in brine and *Z* is a vector of exogenous variables affecting demand (e.g. the price of canned minced tuna in oil, considered as a substitute price in spite of previous and strange findings showing the two products as complements; (S. Jaffry, and Brown, J., 2005) α is the vector of parameters to be estimated and ε is the error term.

The supply side is assumed to run in a non-competitive market, hence price equals marginal cost plus a monopoly component:

$$P = c(Q, W; \beta) - \lambda \cdot h(Q, Z; \alpha) + \eta \qquad (2)$$

where W are exogenous variables on the supply side (e.g. factor prices), β are the supply function parameters, and η is the supply error. Marginal cost is given by $c(\cdot)$ and $P + h(\cdot)$ is marginal revenue. Therefore $P + \lambda \cdot h(\cdot)$ is marginal revenue as perceived by the firm. Under perfect competition, $\lambda = 0$ and price equals marginal cost. When $\lambda = 1$ we face a perfect monopoly power, and when, $0 < \lambda < 1$ various oligopoly regimes apply.

Two input variables were selected: the ex-vessel market price of frozen yellowfin (bigger than 4.5lbs) for canneries and the minimum wage in France (€/hour), the former because frozen tuna represents the major input of canneries, the latter because labour cost is also an important part of the cost.

The general empirical problem in all market structure studies is how to identify λ. Bresnahan solved this by introducing variables that combine elements of both rotation and vertical shifts in the demand curve. This is done by formulating an interaction term between *P* and *Z*, i.e. changes in a substitute price affects both the position and the slope of the demand curve. To provide the necessary intuition for the identification principle used, we formulate the simplest version of the static linear BL model. Assuming both demand and marginal cost to be linear, the demand function (1) can be written as:

$$Q = \alpha_0 + \alpha_p P + \alpha_Z Z + \alpha_{PZ} PZ + \varepsilon, \qquad (3)$$

With the monopoly component, the market equilibrium relation becomes:

$$P = \beta_Q Q + \beta_W W - \lambda \left[\frac{Q}{\alpha_P + \alpha_{PZ} Z} \right] + \eta \qquad (4)$$

since $MR = P + [Q/(\alpha_P + \alpha_{PZ} Z)]$.

By treating α_P and α_{PZ} as known (by first estimating the demand equation), λ is now identified. To see this, write $Q^* = -Q/(\alpha_P + \alpha_{PZ} Z)$. There are two included endogenous variables, *Q* and Q^*, and there are two excluded exogenous variables *Z* and *PZ* in (4). Hence, λ is identified as the coefficient of Q^* based on the estimation of (4). The inclusion of the rotation variable *PZ* in the demand function is crucial for this result. The economic implication of including this rotation variable in the demand equation is that the demand function is not separable in Z. Lau shows that identification is possible as long as this is true, regardless of the functional form chosen.

The product of interest is canned tuna in brine consumed by French households. Therefore, it has been necessary to collect both quantities (Q) and prices (PCBT) for this product. To represent the vector of exogenous variables in the demand equation we use the price of a complement product, namely the price of canned minced tuna in oil (PCMT) (Jaffry and Brown, 2005). Two cost components are used to formulate marginal costs; the price of frozen yellowfin tuna imported by Italy (+10) (PYFIT) and minimum interprofessional wage (SMIC). The data sample comprises from the first quarter of 1995 to the fourth quarter of 2006.

Table 1 The list of variables used in the model

		Order of integration (ADF)	Lags
QBRINE (Q)	Qty of canned tuna in brine consumed in France (t) - OFIMER	I(1)	3
PCBT (P)	Price of canned tuna in brine (€/kg) - OFIMER	I(1)	3
PCMT (Z)	Price of canned minced tuna (€/kg) - OFIMER	I(1)	0
PZ	Rotation term (PCBTPCMT)	I(1)	0
PYFIT (W1)	Price of frozen YFT+10 imported by Italy in €/kg	I(1)	0
SMIC (W2)	Minimum wage in France (€/hour)	I(1)	3

Empirical results

Preliminary tests: integration and cointegration tests

Before specifying the empirical model we test the variables integration order using Augmented Dickey-Fuller unit root test (Dickey and Fuller, 1981). All the variables are I(1), that is, they are not stationary and contain one unit root (Table 1). In order to study the existence of a long-run equilibrium solution we test for cointegration using the multivariate cointegration test suggested by Johansen and Juselius (Johansen, 1988; Johansen and Juselius, 1990).

We need to ensure the existence of a long-run solution in both the demand relation and the supply function. For this reason, we undertake two cointegration tests: one for the demand function and one for the supply equation. Therefore, the matrix of variables in (1), X_t, is composed of the variables Q, PCBT, PCMT and PCBTPCMT (i.e., the interaction term which is obtained by multiplying PCBT by PCMT) for the demand equation, and the variables Q, PCBT, PYFIT, SMIC and Q* for the supply relation.

The cointegration tests allow us to conclude that there is clear evidence of cointegration in both equations. The results, available on simple request to authors, indicate one cointegration relationship considering the trace test and the maximum eigenvalue test. For the supply equation, the trace test and the maximum eigenvalue test indicate two cointegration vectors.

Separability tests

Following Steen and Salvanes (1999), in order to identify λ (i.e., the parameter which represents the degree of competition) we need the demand function not to be separable in the vector of exogenous variables in the demand equation. In order to identify rotation in the MR curve, one variable is enough. Then, our vector of exogenous variables is made up of one variable. This variable is the price of canned minced tuna in oil (PCMT). Therefore, we need the demand function not to be separable in PCMT so as to identify λ. To test this hypothesis we utilise the exclusion tests in the Johansen-Juselius framework.

Exclusion tests (Johansen and Juselius, 1990) analyse if the long-run parameter for PCBTPCMT (i.e., the interaction term) in the cointegration relationship, which has been found in the demand equation, is significantly different from zero. Then, the demand function is separable in PCMT if PCBTPCMT can be excluded from the long-run cointegration relationship or, in other words, we reject the null hypothesis of the test ($H_0 : \beta_{1,PCBTPCMT} = 0$).

The result is shown in Table 2. The null hypothesis of separability is rejected at a 5% significance level. Consequently, the demand function is not separable in PCMT and this interaction term, PCBTPCMT, can be used to identify λ.

Table 2. Separability test

	Statistic
H_0: $\beta_{1,PCBTPCMT}=0$	5.79037*

Notes: * Significance at a 5% level, ** significance at a 10% level.

The empirical model

After performing the unit root, cointegration, weak exogeneity and separability tests, we proceed to estimate the demand equation:

$$\Delta Q_{it} = \alpha_0 + \sum_{i=1}^{3}\tau_{iD}D_{i,t} + \sum_{i=1}^{n-1}\alpha_{Q,i}\Delta Q_{t-i} + \sum_{i=0}^{n-1}\alpha_{PCBT,i}\Delta PCBT_{t-i} + \sum_{i=0}^{n-1}\alpha_{PCMT,i}\Delta PCMT_{t-i}$$
$$+\sum_{i=0}^{n-1}\alpha_{PCBTPCMT,i}\Delta PCBTPCMT_{t-i} + \eta*\left(Q_{t-k} - \theta_{PCBT}PCBT_{t-k} - \theta_{PCMT}PCMT_{t-k} - \theta_{PCBTPCMT}\,PCBTPCMT_{t-k}\right) + \varepsilon_t \quad (2)$$

and the supply relation:

$$\Delta PCBT_{it} = \beta_0 + \sum_{i=1}^{n-1}\beta_{PCBT,i}\,\Delta PCBT_{t-i} + \sum_{i=0}^{n-1}\beta_{Q,i}\,\Delta Q_{t-i} + \sum_{i=0}^{n-1}\beta_{PYFIT,i}\,\Delta PYFIT_{t-i} + \sum_{i=0}^{n-1}\beta_{SMIC,i}\,\Delta SMIC_{t-i}$$
$$+\sum_{i=0}^{n-1}\beta_{Q^*,i}\Delta Q_i^* + \gamma*\left(Q_{t-k} - \delta_{PCBT}PCBT_{t-k} - \delta_{PYFIT}PYFIT_{t-k} - \delta_{SMIC}SMIC_{t-k} - \Omega_{Q^*}Q^*_{t-k}\right) + \upsilon_t \quad (3)$$

where $Q^*_{margin,t} = \left(Q_t / \left(\theta_{PCBT} + \theta_{PCBTPCMT}PCMT_t\right)\right)$.

The demand function

We will start presenting the results for the demand function (Equation (2)):

$$\Delta Q_{it} = 21574.10 + 4253.49D_{1,t} + 2545.17D_{2,t} - 2782.74D_{3,t} + 1611.01\Delta PCBT_t + 3429.32\Delta PCMT_t$$
$$-375.22\Delta PCBTPCMT_t - 0.66\left(Q_{t-1} + 4316.72PCBT_{t-1} + 5230.14PCMT_{t-1} - 909.00PCBTPCMT_{t-1}\right) + \varepsilon_t \quad (4)$$
$$R^2=0.97$$

The model fits well because it has an R^2 of 0.97. The long-run parameters have the correct signs. Additionally, the model was tested for autocorrelation using the autocorrelation LM test up to order 1. The statistic of this test is 0.041, which allows us to conclude that there is no presence of autocorrelation.

The estimate of the adjustment parameter is -0.66. As Salvanes and Steen (1999) point out, this parameter is expected to be in the range of -1 to 0. If it were zero, there is no error correction. On the other hand, if it were one, a deviation from the long-run equilibrium path would be adjusted instantly. In Tables 6 and 7, the significance of the parameters is displayed. All the long-run parameters are significantly different from zero and most of the short-run coefficients are also significant.

Table 3. Significance of long-run coefficients: exclusion tests (demand equation)

Long-run parameters	Statistics
θ_Q	6.83*
θ_{PCBT}	5.89*
θ_{PCMT}	5.29*
$\theta_{PCBTPCMT}$	5.79*

Notes: * Significance at a 5% level, ** significance at a 10% level.

Table 4. Significance of short-run coefficients (demand equation)

Variable	Statistics
α_0	5.32*
$\alpha_{PCBT,0}$	0.97
$\alpha_{PCMT,0}$	1.46
$\alpha_{PCBTPCMT,0}$	-1.10
τ_{1D}	14.35*
τ_{2D}	3.51*
τ_{3D}	-3.82*
η*	-5.31*

Notes: * Significance at a 5% level, ** significance at a 10% level.

Finally, the long-run own-price elasticity has been computed using the formula $\in_{PCBT,PCBT} = \left[\theta_{PCBT} + \theta_{PCBTPCMT}\overline{PCMT}\right]\cdot\left[\overline{PCBT}/\overline{Q}\right]$ and it is equal to -0.13. Therefore, it suggests that each 1% increase in market price in canned tuna in brine would lead to a 0.13% decrease in their demand. In other words, a change in price can elicit a less-than-proportional change (in the opposite direction) in the quantity of sales. Likewise, the cross-price elasticity has been determined using the formula $\in_{PCBT,PCMT} = \left[\theta_{PCMT} + \theta_{PCBTPCMT}\overline{PCBT}\right]\cdot\left[\overline{PCMT}/\overline{Q}\right]$ and it amounts to -0.57. As the cross price elasticity has a negative sign, it confirms that both products can be considered complements, which is amazingly in line with other estimations despite unclear interpretation (Jaffry and Brown 2005).

<u>The supply function</u>

In this case, considering the cointegration and weak exogeneity tests, it has not been possible to estimate a single equation. However, following Steen and Salvanes (1999), we have performed an exclusion test on the long-run coefficients of Q* in the two cointegration relationships. This test has allowed us to study the existence of market power. The null hypothesis of non-existence of market power is $H_0 : \beta_{1,Q*} = \beta_{2,Q*} = 0$. The alternative hypothesis of existence of market power is $H_1 : \beta_{1,Q*} \neq \beta_{2,Q*} \neq 0$. The χ^2 statistic is 25.92. Therefore, we reject the null hypothesis at the 1% significance level and, consequently, there is evidence of market power.

4. Discussion of the results and implications for the tuna fisheries and trade

Although evidence of market power has been brought by the estimated Bresnahan-Lau model, it was not made possible to assess the extent to which market power is exercised by the canning or retailing industry upon the French consumers. Another attempt was done by using an OLS estimation. Such estimation is allowed for I(1) variables as long as weak exogeneity can be found for most of the variables in one cointegration relationship (Susanto 2006). In our estimation the problem is that there were two cointegration relationships and Q was not found exogenous and this is valid "only when all right-hand variables in a single equation are weakly exogenous does the single-equation approach provide the same result as a multivariate equation approach" (Asteriou 2006, p. 342). If this condition was met for the demand equation, it was not the case for the supply equation.

In other words, the canneries and retailers have perfectly transmitted the price drop to consumers of canned skipjack but our results show that it has not been the case for canned yellowfin in brine consumed in France (Jiménez-Toribio *et al.* 2007). The reason can either be found in the high degree of differentiation on the French market of canned tuna (private brands), or in the level of trade protection, through a 24% tariff paid by the Asian goods to enter the European markets.

Because we used consumer prices and ex-vessel prices of tuna in our model, the increasing margin can be caused either by the processing industry or by the supermarket chains. It makes no doubt that part of the increasing returns to scale, hence concentration, of the last two decades in the canning sector is certainly due to the steady growth and concentration of the retailing industry, at least in the European Union. The big retailing chains (5 or 6 remaining ones in each country after many mergers and acquisitions) concentrate more than 80% of canned tuna sales in most of the European countries. They need to deal with strong commercial partners in the manufacturing sector to follow them in their worldwide expansion (Walmart, Carrefour, Tesco…).

Along the value chain, not less than three concentrated middle stake-holders set their markups between the producers and the consumers (packers, traders, retailers). This problem is known in the literature as the double-marginalization problem (or treble-marginalization in the present case!). The final product price paid by the consumer is generally higher than a vertically-integrated monopolist would set up. The common solutions for double-marginalization are vertical integration or vertical restraints (Sherman 2008). Regarding the vertical integration solution, very rare are the cases where a retailer would accept to merge with a cannery, although it has occurred in the past. Indeed, we saw that sub-contracting practices have developed instead of the former vertical integration of packers. More commonplace are vertical restraints such as two-part pricing, franchising, profit-sharing through private labels and resale price maintenance.

Private or own labels (of retailers) are known as providing for the retailer higher profit margins despite lower sale prices (Barsky *et al.* 2001). "The consequence of the strategic effect is that not only will the mark-up on own label products be higher as a direct consequence of retailer bargaining power with own-label manufacturers but it will also serve to shift rent from national brand manufacturers" (Mac Corriston 2002). On the French seafood market for canned fish, the market share of retailers' private labels was estimated around 32.8% (in value) in 2007 and it has not changed since 2000 (source AC Nielsen). In Spain, the market share for canned tuna is greater, around 54% (source Alimarket), and can reach higher proportions for some market segments (59% for canned yellowfin in vegetal oil or 70% for canned skipjack) (source: IRI España, in Alimarket February 2008). This strong trend reinforces the idea of market power that is not necessarily exercised through unit margins and may hit as well the manufacturers' brands. The so-called "Backward margins" (marketing services charged by supermarkets to the manufacturers) may represent half of the final price paid by the consumer. Such practices are not really testable through a price analysis, though representing high levels of profits for the superstore chains.

The consequences for the tuna fisheries are really detrimental because the large-scale industries down the chain impose increasing returns to scale up the chain through ever bigger and more efficient purse-seiners. As a result, both consumer and producers surplus are captured by the high processing and retailing mark-ups. The globalisation of markets through the global strategies of multinational firms fishing and processing tuna in low-cost countries has undoubtedly "trapped" the fisheries into this welfare-reducing trade, increasing the fishing effort to meet the volume requirements of the canning industry and squeezing the consumer surplus of the northern markets. The fully –if not over- exploited stocks of tuna in the three major oceans along with the increasing fuel price should address new questions to this economic model and may hopefully encourage the development of new and more sustainable value chains for tuna products.

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ENDNOTES

[i] Including the American Starkist (ex-property of Heinz prior its sale to Del Monte Foods in 2006 and to the Korean group Dongwon in 2008) which used to own, until 2006, the French brand "*Petit Navire*" since 1978 and shares of other processing plants in the Seychelles since 1987 and in Ghana since 1994. Since 2006, these two important canneries in the Seychelles (IOT) and Ghana (PFC) are owned by the US investment bank Lehman Brothers.

[ii] Complete suspension of trade tariffs is offered to some developing countries under the EU-ACP agreements and the 'GSP Plus' tariff system, which is a sub-system of the Generalised System of Preferences in particular available to Andean and Central American countries in order to help them in fighting against the production of illicit drugs.

[iii] Indeed, in most markets, canned tuna is considered as a rather low-valued product, being subject to possible substitution effects (Babula and Corey 2005).