JAE Journal of Agricultural Economics

Journal of Agricultural Economics, Vol. 62, No. 3, 2011, 655–668
doi: 10.1111/j.1477-9552.2011.00299.x

The Elusive Price Premium for Ecolabelled Products: Evidence from Seafood in the UK Market

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(Original submitted August 2010, revision received January 2011, accepted February 2011.)

Abstract

Ecolabelling is an increasingly important tool used in the promotion of sustainable forestry and fishery products around the world. Whether the consumer is actually paying a price premium for ecolabelled products is of fundamental importance as it indicates a return on the investment of sustainable practices, providing an incentive for producers to undertake such practices. This article seeks to address the question of whether or not an actual premium is being paid by consumers for ecolabelled seafood by conducting a hedonic analysis of Marine Stewardship Council (MSC)-certified frozen processed Alaska pollock products in the London metropolitan area in the UK market using scanner data. Regression results show a statistically significant premium of 14.2%. This implies the presence of market differentiation for sustainable seafood and the potential of the MSC's fisheries certification programme to generate market incentives for sustainable fisheries practices.

Keywords: *Alaska pollock*; *consumer preferences*; *ecolabelling*; *hedonic analysis*; *Marine Stewardship Council*; *price premia*; *scanner data*; *sustainable seafood.*

JEL classifications: *C23, D12, Q11, Q22.*

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1. Introduction

Governance of common pool resources, such as fisheries and publicly-owned forests, often fails to correct for over-exploitation of the resources (Smith *et al*., 2010). In some cases, poor management may evolve from a close relationship between the managers and the industry being managed. As a result, decisions regarding what is best for the resource are replaced by decisions regarding what is best for those utilising the resource. To allow consumers a voice, certification programmes for sustainably-managed resources and ecolabelled products derived from those resources have been introduced.

The goal of ecolabelling programmes is to create market-based incentives for better management of the environment. Ecolabels provide otherwise unobservable information to the consumer about the environmental attributes of goods, allowing consumers to differentiate between products carrying the labels from those which do not (US Environmental Protection Agency (US EPA), 1998). If consumers value the environmental attributes of the products conveyed by the ecolabel, they will shift their demand towards the ecolabelled products and away from the non-labelled products. This in turn may create a price premium for ecolabelled products over non-labelled products, thereby creating a market incentive for producers to supply those environmental attributes (Guðmundsson and Wessells, 2000; Sedjo and Swallow, 2002).

Ecolabelling has become an increasingly important tool in the promotion of sustainable forestry and seafood products around the world (Teisl *et al*., 2002; Cashore *et al*., 2003; Roheim, 2008). In relation to seafood, the approach has created significant attention in markets since the first capture fishery was certified as sustainable against the Marine Stewardship Council's (MSC) standards in 2000.[2] Those who sell products from fisheries which are MSC certified may purchase licences for the right to place the MSC ecolabel on affiliated products, signalling to consumers that the product was produced from a sustainable fishery. Although there are now competing labels, the MSC is the leading label in terms of the number of fisheries certified, volume of edible seafood certified, and logo presence in the global marketplace (Parkes *et al*., 2010).

Whether the consumer is paying a price premium for ecolabelled products is one indicator of the market effectiveness of ecolabelling schemes. Yet there is a surprising lack of literature demonstrating the existence of price premiums for either seafood or wood products. A number of studies have found evidence that consumers indicate a preference for ecolabelled seafood, including Wessells *et al*. (1999), Johnston *et al*. (2001), Jaffry *et al*. (2004), Johnston and Roheim (2006), Brécard *et al*. (2009) and Salladarré *et al*. (2010), and for ecolabelled wood products, including Ozanne and Vlosky (1997, 2003), Forsyth *et al*. (1999), Teisl *et al*. (2002) and Aguilar and Vlosky (2007). However, this literature is based upon contingent valuation survey data and shows only that consumers state a preference for ecolabelled products under certain conditions. Determining the existence of actual price premiums in the market for ecolabelled products is important to address the expressions of skepticism by policy-makers and others regarding the effectiveness of ecolabelling as a tool to create more effective management (OECD High Seas Task Force, 2006;

[2] Similarly, the Forestry Stewardship Council (FSC) is a leading sustainable forestry certification body.

Washington, 2008). Such skepticism exists due to the lack of rigorous evidence that consumer preferences have transformed into actual price premiums for the certified fisheries.

The purpose of this article is to investigate whether or not there is a demonstrated price premium in the retail market for ecolabelled seafood. A demonstrated price premium paid at the retail level may, depending upon the price transmission mechanism, indicate compensation at the fish production level. Because the focus of the analysis is upon the marginal value of the ecolabel, in other words the price premium, we follow Rosen (1974) and use a hedonic price model. Our empirical analysis is applied to scanner data on frozen processed pollock products in the London metropolitan area. Scanner data are increasingly being used in price analysis, including hedonic analysis of price premiums for such labels as fair trade coffee (Galarraga and Markandya, 2004) and organic agricultural products (Lin *et al.*, 2008; Smith *et al.*, 2009; Zhang *et al.*, 2009).

The article proceeds as follows. The next section presents a brief background on the MSC programme and seafood ecolabelling, as well as a discussion of the rationale behind the research focus on a retail market in the UK and MSC-labelled pollock. This is followed by a description of the data used, and a discussion of the model specification and estimation procedure used to measure the price premium. Results and implications from the model are discussed next, followed by the concluding remarks.

2. Background

The MSC's fishery certification programme and seafood ecolabel recognise and reward sustainable fishing.[3] The earliest fisheries certified were Alaskan salmon, Western Australian rock lobster and Thames River herring in 2000. In 2005 when the Alaska pollock (*Theragra chalcogramma*) fisheries in Alaska's Gulf of Alaska and Bering Sea were certified, the number of certified fisheries was only 13. In contrast, the number of certified fisheries as of January 2011 was 102. The number of fisheries in assessment for certification as of January 2011 was 132.[4] As the number of fisheries in the programme has grown, so has the market for MSC-labelled products. There are more than 5,000 MSC-labelled products on sale globally in over 66 countries with a retail value of over US$2 billion annually (Marine Stewardship Council (MSC), 2009).

Alaska pollock represents one of the largest fisheries in the world, and, in spite of the growth of the MSC programme, the largest proportion of volume among the certified fisheries within the MSC programme. This fishery has an average annual historical catch of approximately one million metric tons during the past 30 years, with catch levels set by the US federal fisheries management (National Marine

[3] The MSC is only one among a number of seafood ecolabelling programmes. Others include: dolphin-safe, Friends of the Sea, the Aquaculture Certification Council and numerous European organic labelling programmes on aquacultured fish. Dolphin-safe labelling has been in existence for a number of years, not certifying the sustainability of tuna, but rather the protection of dolphins associated in the capture of tuna.

[4] See www.msc.org.

Fisheries Service (NMFS), 2009). The primary markets for Alaska pollock are North America, Europe and Japan.

Whether the consumer is paying a price premium for ecolabelled products is one indicator of the market effectiveness of ecolabelling schemes. Guðmundsson and Wessells (2000) provide a theoretical framework showing that price premiums play a critical role in providing market-based incentives to the fishing sector for improving or maintain sustainable fishing practices. Wessells *et al.* (1999), Johnston *et al.* (2001), Jaffry *et al.* (2004), Johnston and Roheim (2006) and Brécard *et al.* (2009) have shown empirically that some consumers prefer ecolabelled seafood products over non-labelled, and a statistically significant proportion indicate a hypothetical willingness to pay a positive premium, while Ozanne and Vlosky (1997, 2003), Teisl *et al.* (2002) and Aguilar and Vlosky (2007) show the same for ecolabelled wood products. However, these studies have in common that they use hypothetical data. The studies do not provide an estimated premium, and actual price premiums paid in the market, if any, are yet to be determined.

In spite of the results of these studies, Gulbrandsen (2006) argues that most markets for ecolabelled forestry and fisheries products have been created as a result of pressure by environmental groups on consumer-facing corporations, rather than resulting from consumer demand. O'Brien and Teisl (2004) go so far as to say that ecolabels are ineffective due to a lack of marketing, leading to a lack of consumer awareness of ecolabels in forest certification. Roheim (2008) concurs, positing that the market for ecolabelled seafood is driven less by consumer demand than by corporate decisions to source certified sustainable seafood for a variety of reasons, including risk reduction. On the other hand, according to Sedjo and Swallow (2002), even though consumers may express interest in purchasing an ecolabelled product, this does not suffice as evidence that a price premium will manifest in the market. These academic discussions provide an impetus for research to document whether or not actual price premiums are being paid.

However, the most basic reason to determine the existence, if any, of price premiums in the market is to assist in evaluation of effectiveness of the ecolabelling as a market-based incentive. Producers of certified products and those contemplating assessment for certification are increasingly demanding proof of market benefits to justify the costs of the assessment process and of practicing sustainable fishing. For instance, according to Washington (2008) and Roheim (2003), the costs of obtaining MSC certification can range from US$ 10,000 for small and simple fisheries to US$ 500,000 for large and complex fisheries like the US pollock fishery. Maintaining certification creates additional costs. However, costs of certification are only a fraction of the costs of transiting to a sustainable fishery from a fishery which previously did not meet the conditions for sustainability. A sustainable fishery requires investment in appropriate fisheries management, practices and capital. None are costless. Before entering the certification assessment process, fisheries must perceive that market benefits will be enough to offset these costs. Market benefits may not simply be a price premium as such, but may also include improved market access to premium markets, expanded market share in existing markets and greater ability to favourably position oneself in the market with competitors (Roheim, 2008).

Downstream in the supply chain, those who must have chain of custody certification also seek quantitative proof of the presence or absence of market benefits (Roheim, 2008). These firms have invested significantly in the programme by

sourcing certified product and paying licence fees to place the logo on the products. A positive return is expected on this investment.

There are several reasons why analysis of premiums on MSC-labelled pollock products in the UK market is an ideal starting point from which to evaluate market benefits of fisheries certification. The UK market established itself early in sustainable seafood sourcing. This development was to a large extent driven by seafood processors and supermarket chains with strong commitments to the MSC and sustainable seafood sourcing (Roheim and Sutinen, 2006; Roheim, 2008). We focus on Alaska pollock products since the Alaska pollock fisheries were certified relatively early (in 2005). As such, enough time has elapsed to ensure that a significant number of MSC-labelled pollock products are in the market. Furthermore, UK supermarkets carry a number of frozen processed seafood products specifically-labelled as pollock (not whitefish) both with and without the MSC label. Finally, one of the essential conditions of a successful ecolabelling scheme is familiarity with and exposure to the label. Consumers in the UK are most likely to be aware of the label because of greater marketing of the MSC programme within the UK through the Fish and Kids programme, events hosted by Prince Charles, and other marketing efforts (http://www.msc.org). Jaffry *et al*. (2004) confirms consumer interest in ecolabelled seafood in the UK. For these reasons, the focus of this article is on the UK retail market for pollock.

3. Data

To assess the existence and size of retail price premiums for MSC-labelled Alaska pollock, scanner data were used in the estimation of a hedonic model. Scanner data from retail sales of products became widely available in the 1980s and are based on stock-keeping units (SKU) or bar code scanning at the supermarket checkout counters. For this project, Information Resources Inc. (IRI) Infoscan data were purchased for the London metropolitan market area. Infoscan data measures specific product flow through supermarkets. The data are aggregated over a sample of several hundred supermarkets. It differs from scanner data based upon household panels in that it does not collect data on individual consumers at individual supermarkets.[5] Cotterill (1994) argues that even with aggregation, the market data contained in IRI Infoscan data allows for a rich set of possible empirical insights. For example, several researchers have used Infoscan data to investigate the effect of other types of labels: Lusk (2010) provides an evaluation of demand for cage free, organic and conventional eggs, and Cotterill *et al*. (2000) and Cotterill and Putsis (2000) in analyses of the competition between national and private labels of breakfast cereals and carbonated beverages.

The Infoscan database provides volume and dollar sales by SKU for over 400 frozen processed seafood products aggregated across supermarkets in the London metropolitan area on a weekly basis for 65 weeks, from 24 February 2007 to 17 May 2008. Unit prices for each product are averages derived from total sales and volumes. The focus is on processed food products as these are the only products for which SKUs are consistent across all supermarkets. SKUs on fresh products sold

[5] The choice of Infoscan data as opposed to household panel data was largely based upon cost, the latter being significantly more expensive.

are specific to stores or supermarket chains, therefore fresh fish could not be included in the analysis.

For each pollock SKU, information provided includes: brand, species, product type (such as breaded, battered, natural smoked), product form (such as fillets, fish fingers and kids fish – products in various 'fun' shapes), and package size. Brands include national labels such as Young's and Bird's Eye or private labels. Private labels are labels associated with individual supermarket chains. The Infoscan database does not specifically identify the label, thus these products are simply identified as 'private label' products.

A total of 24 pollock products are included in the analysis. These products are similar in product form (fillets, fish fingers, kids' fish). Pollock products which are highly value added, such as ocean pies or in which vegetables are added, are excluded. The Infoscan database does not contain information on which products carry the MSC label. Working with the logo licensing manager at the MSC, viewing the products on the websites of the producers and supermarket chains, and contacting the producers directly for affirmation, 12 of those products were identified as displaying the MSC ecolabel. Each national brand marketed both ecolabelled products and non-labelled products, indicating that these brands have differentiated individual product lines. Of the nine Young's products, seven appear with the MSC label. Of the 11 Bird's Eye products, five have the MSC label, whereas none of the four private label products have the MSC label.[6] There were six kids' fish products, 10 fillet products and 11 finger products. Package sizes varied from a low of 240 g to a high of 1,080 g.

In all, a panel dataset of 1,137 observations was included in the analysis, one observation for each week when the 24 products were sold. During the 65 week time period, none of the products appear in the market for the entire period. Some products are introduced, and other products are withdrawn from the market during the observation period. Given negligible inflation during the short time period, nominal prices are used.

The appearance of an MSC-labelled product on store shelves, with or without a price premium, does not guarantee that consumers will purchase the product. Pollock historically has been sold as a generic 'whitefish' in the UK market. After certification it has been specifically identified as pollock on product packages. Analysis of the data shows that 3.03 million units of 12 non-MSC labelled products were sold during the 65 week period in the London market area, while 3.3 million units of 12 MSC-labelled products were sold during the same period.

4. Model Specification and Estimation

The hedonic model specifies the price of a product as a function of the attributes that characterise the product. The model can be written in its general form as:

$$P_{it} = f(s_1, \ldots, s_n), \tag{1}$$

where P_{it} is the price of good i at time t, and $\boldsymbol{S} = (s_1, \ldots, s_n)$ is a vector of attributes that determines the price of the good. As such, the function allows a test of

[6] As all products bearing the MSC logo must be licenced, the private label products were determined not to have the logo based upon the SKU description of the product.

the value of each attribute, given that all other attributes are held constant. Each attribute j can be measured on a continuous scale or by a dummy variable depending on its type.

Linear and log-linear functional forms are frequently found in the literature for such models. For example, McConnell and Strand (2000), Carroll *et al.* (2001) and Smith *et al.* (2009) use linear functional forms for hedonic models of individual products' pricing. Smith *et al.* (2009) cite ease of interpretation as one reason to use the linear model in their estimation of the premium for organic milk, as the parameter estimates on the organic attribute variable can be interpreted as the premium in currency units. Similarly, a log-linear functional form can also be easily interpreted, where the parameter estimates are evaluated in percentages. In this application, a multiple of products of different base values are included in the analysis. A Box–Cox test showed no functional form was clearly preferred, thus, given that a percentage over the base value is more meaningful a log-linear functional form was specified[7]:

$$\text{Ln } P_{it} = a + \sum_{j=1}^{k} \beta_j \text{brand}_{jit} + \sum_{l=1}^{m} \phi_l \text{form}_{lit} + \sum_{n=1}^{z} \gamma_n \text{type}_{nit} + b \text{ Ln Size}_{it} + \text{cMSC}_{it} + e_{it}, \tag{2}$$

where j indexes the brand attributes (Young's, Birdseye or private label), l indexes process form (breaded, battered or natural/smoked), n indexes product type (fish fingers, fillets or kids' fish) and e_{it} is a random error. In this analysis, the attributes are all expressed as dummy variables (see Table 1), except package size. Package size is specified as a continuous variable, in logarithmic form. Dummy variable coding was used instead of alternative coding, such as effects coding, as it is easily interpretable given the large number of attributes included in the model specification. This follows established methodology of previous literature using hedonic methods to estimate the marginal value of attributes of seafood products, including McConnell and Strand (2000), Carroll *et al.* (2001) and Roheim *et al.* (2007), as well as hedonic analyses of organic produce (Smith *et al.*, 2009), organic milk (Lin *et al.*, 2008), organic tomatoes and apples (Zhang *et al.*, 2009), and ecolabelled apparel (Nimon and Beghin, 1999).

By including a constant term, the parameters are interpreted as the percent deviations from a basic product with a given set of attributes. In each dimension one can investigate whether the different attributes have different marginal values by testing whether the associated parameters are zero. Own-label, kids fish, natural smoked, and non-MSC labelled serve as the base attributes for the model. Models which included interactive effects between the MSC label and other attributes were tested, however none were statistically significant.

As scanner data contain observations on multiple products of differing average values, the variances of the error terms are likely to differ across products. White's (1980) test rejected the hypothesis of homoskedasticity at the 1% significance level. The model, which was run using STATA™, corrected for heteroskedasticity with a heteroskedasticity-consistent covariance matrix estimator (MacKinnon and White,

[7] For comparison, marginal values were also calculated at the mean from a model estimated with a linear functional form, resulting in a premium on the MSC label in percentage terms that was virtually identical to the premium estimated from the log-linear model.

Table 1
Variables and their descriptive statistics

Variable	Description	Mean	SD
Price	Average unit price in pounds sterling	2.02	0.94
Ln P	Log of Price	0.58	0.52
Size	Package Size in grams	436	217
Ln Size	Log of Size	5.98	0.43
Birds Eye	Dummy variable for Birds Eye brand, 1 if present, 0 if not	0.46	–
Youngs	Dummy variable for Young's brand, 1 if present, 0 if not	0.39	–
OwnLabel	Dummy variable for Own Label brands, 1 if present, 0 if not	0.15	–
MSC	Dummy variable to indicate presence of MSC logo, 1 if present, 0 if not	0.51	–
Breaded	Dummy variable to indicate if product was coated in breading, 1 if so, 0 if not	0.49	–
Battered	Dummy variable to indicate if product was coated in batter, 1 if so, 0 if not	0.39	–
Natural Smoked	Dummy variable to indicate if product was natural smoked, 1 if so, 0 if not	0.01	–
Fillet	Dummy variable to indicate if product was in fillet form, 1 if so, 0 if not	0.48	–
Finger	Dummy variable to indicate if product was in fish finger form, 1 if so, 0 if not	0.40	–
Kidsfish	Dummy variable to indicate if product was in kidsfish form, 1 if so, 0 if not	0.11	–

Notes: SD not reported for dummy variables; MSC, Marine Stewardship Council.

1985). Following Davidson and MacKinnon (2004), the HC3 covariance matrix estimator was used. The data were also tested for the presence of multicollinearity, although no significant effect on model results was detected.

5. Results

Table 2 reports the coefficient estimates and goodness-of-fit of the model. Overall, the estimated equation is highly significant with a P-value < 0.0001 and t-statistics indicate each coefficient is significant at a minimum of the 5% level. These results show the heterogeneity of the seafood market. The individual coefficients indicate that, on average, Birds Eye branded frozen processed pollock products are 56% more expensive than private label products, whereas Young's branded products are 35.5% more expensive than private label products. A more precise percentage premium results from subtracting 1 from the exponential of the parameter, as that represents the proportionate difference, holding all other attributes constant (Wooldridge, 2003). As a result, the Birds Eye brand products are 76% more expensive than private label products, whereas Young's brand products are 43% more expensive. To determine if branding contributed to the fit of the equation as an attribute category, an F-test was performed and reported in Table 3. Significant at

Table 2
Parameter estimates

Variable	Coefficient estimate	Robust HC3 (SE)	*t*-ratio
Intercept	−4.79***	0.130	−36.93
MSC	0.133***	0.023	5.77
Ln Size	0.822***	0.020	42.09
Young's	0.355***	0.044	8.06
BirdsEye	0.564***	0.033	16.90
Breaded	−0.116***	0.044	−2.62
Battered	−0.273***	0.031	−8.77
Fillet	0.398***	0.031	12.74
Finger	−0.067**	0.029	−2.32
R^2	0.649		
No. of observations	1,137		
Pr > *F*	$p < 0.0001$		

Notes: ***, ** indicate significances at $p < 0.01$, $p < 0.05$.
MSC, Marine Stewardship Council.

the 1% level, this test rejects the hypothesis that a product price is independent of brand, indicating that brand is an attribute that contributes to the segmentation of the seafood market.

Breaded pollock products are 11% less expensive than natural smoked pollock, whereas battered is 24% less expensive and both are individually statistically significant. While typically considered 'value-added' products, breading and battering may be adding value to a product which is of lower value from an initial state, perhaps because of lower quality. In other words, if the product were of sufficiently high quality, one might expect that the fish would be marketed as the higher-valued product, natural. Thus, so-called 'value-added' from breading and battering actually may be a process form that masks some of the quality control issues generated in the supply chain. Again the *F*-test result shown in Table 3 indicates that process form, as an attribute sub-group, significantly explains changes in product price which follows intuitively from the previous discussion.

Fillets are 49% more expensive than kids' fish, whereas fish fingers are 6% less expensive than kids' fish, statistically significant both individually and as an attribute group. There is a positive and significant relationship between price and portion size.

The focus of this analysis is whether or not there is a price premium for MSC-labelled products. Thus, the premium is estimated to be 14.2% on these

Table 3
Comparison of hypotheses of attribute category inclusion

Null hypothesis	$F(2, 1128)$	Prob > *F*
Brand: $\beta_1 = \beta_2 = 0$	165.50***	0.0000
Process form: $\phi_1 = \phi_2 = 0$	78.29***	0.0000
Product type: $\gamma_1 = \gamma_2 = 0$	149.36***	0.0000

Note: *** indicates significance at $p < 0.01$.

MSC-labelled processed frozen processed pollock products relative to non-MSC labelled frozen processed pollock products after fully accounting for the other product attributes such as brand, product form, package size and process form.

Although it is useful to put this estimated premium into context, there are limitations in our ability to do so. First, as mentioned previously, there are no existing studies of actual premiums paid for ecolabelled seafood in the UK market or any other market, or for any other seafood products. Second, previous analyses of consumer preferences for ecolabelled seafood have not generally estimated willingness to pay (WTP), but rather evaluated factors which influenced the probability of hypothetical purchase of ecolabelled seafood products, including Wessells *et al.* (1999), Johnston *et al.* (2001), Johnston and Roheim (2006), Jaffry *et al.* (2004), Brécard *et al.* (2009) and Salladarré *et al.* (2010). Only in Johnston *et al.* (2001), in an international comparison of roughly 2,000 consumers in both the US and Norway, a within-sample prediction was performed that showed 80% of US consumers would be willing to pay an average 24% premium for ecolabelled salmon, cod and shrimp, whereas 54% of Norwegian consumers would be willing to pay the same price premium. These estimates are higher than the actual premium estimated as paid in the UK market, and may be a result of the hypothetical nature of the survey-based study in Johnston *et al.* (2001) as well as differences in geographical markets.

Other interesting comparisons may be to look at alternative forms of product differentiation. Focusing on analyses that use scanner data and hedonic methodology to statistically estimate actual price premiums, we investigate existing literature for organic, fair trade and branding attributes. Among these, Galarraga and Markandya (2004) find an 11% premium in the UK market for fair trade coffee over regular coffee. Roheim *et al.* (2007) determine the value of branding finding that national brands across many seafood commodities in the UK have a 10% premium over private labels. Lin *et al.* (2008) and Smith *et al.* (2009) show that organic labelling in the US yields price premiums between 15% and 60%, depending upon food product and geographical market within the US[8] This implies that seafood ecolabels may be valued slightly higher than fair trade coffee in the UK. However, the premium is on the lower end with respect to what has been reported for organic products in the US. Such a difference in premiums may not be surprising as fair trade and environmental sustainability may yield only warm glow effects which may be less welfare improving in terms of consumer utility than the combination of environmental sustainability and perceived health benefits potentially derived from consumption of organic products (Andreoni, 1990; Yiridoe *et al.*, 2005).

6. Conclusions

Success of ecolabelling programmes in fisheries depends upon: (i) a sufficient number of well-managed fisheries becoming and remaining certified, thus placing a critical mass of certified product into the supply chain; (ii) creating the incentives to reform poorly managed fisheries such that they become well-managed fisheries.

[8] The authors were unable to locate any literature on actual price premiums for organic foods in the UK. WTP studies of UK consumers indicate a premium between 30% and 50% (Yiridoe *et al.*, 2005).

To create that success, market benefits are necessary for ecolabelling programmes to influence production and management practices in any industry. Price premiums are a direct means by which to offset costs incurred from sustainable fishing practices certified under fisheries ecolabelling programmes, and are more directly measureable than other market benefits such as improved market access or expanded market share. To date, all evidence of the effect of ecolabels for seafood has been obtained using survey data (Wessells *et al*., 1999; Johnston *et al*., 2001; Jaffry *et al*., 2004; Johnston and Roheim, 2006; Salladarré *et al*., 2010). Anecdotal evidence indicates the shift of European processors such as Unilever, Young's Bluecrest and Frosta from sourcing Russian pollock towards US pollock due to sustainability certification (Roheim and Sutinen, 2006). However, doubts have frequently been expressed that price premiums actually exist (OECD High Seas Task Force, 2006 and Washington, 2008). In relation to the MSC, Washington (2008) stated that the price premium is a myth and the OECD High Seas Task Force (2006) stated that no evidence exists which documents effectiveness of ecolabelling schemes in creating market incentives for better fishing practices. Data limitations and complexities of the market often make it difficult to quantify market benefits (Gilmore, 2008; Roheim, 2008).

This article provides statistically significant *ex post* evidence of market benefits of fisheries certification at the retail level: payment of price premiums for ecolabelled seafood, possibly the first analysis to do so. A limitation of the research lies in its scope – it focuses only on the London metropolitan area, and on frozen processed pollock. There are several remaining questions. For example, is the premium sufficient to cover costs of a sustainable fishery and certification? This remains an open question, as the UK market represents only a small portion of the market into which Alaska pollock is sold. Further research is needed to determine the size of the premium in the other markets for pollock (the rest of Europe, North America and Japan). Furthermore, yet to be determined is whether the premium transmits from the retail level to the production level to compensate those who are engaged in fishing activities. Indeed, it is not clear that there is adequate information for comparison on the actual cost of transition from a fishery that does not meet the criteria of sustainability to one that does, in addition to the costs of certification and maintenance of certification. In addition, over 100 other certified fisheries and many other markets are yet to be investigated. The most compelling evidence that benefits outweigh the costs comes from the behaviour of the fishing industry itself: the number of fisheries in assessment and becoming certified continues to grow. Thus, this research can only be the beginning of the analysis of the market benefits of MSC certification. Yet it is a reasonable beginning, and does show that a price premium is being obtained at the retail level for certified sustainable pollock over non-MSC labelled pollock which does not carry the MSC label, holding other product attributes constant.

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