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Pricing of eco-labels with retailer heterogeneity

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ABSTRACT

Eco-labels are important features of many natural resource and food markets. They certify that a product has some desirable unobserved quality, typically related to a public good such as being sustainably produced. Two issues that have received limited attention are whether pricing varies across different eco-labels that may compete with each other and to what extent different retailers charge different prices. Using a unique data set of salmon prices in eight different United Kingdom retail chains, we investigate these issues by estimating a price-attribute model that includes two eco-labels and one country-of-origin label. Results show substantial variation in the prices of the different eco-labels and that eco-label premiums vary across retail chains. Specifically, salmon certified with the Marine Stewardship Council (MSC) label has a high premium in low-end retail chains but no statistically significant premium in the high-end chains. These findings question the ability of the MSC label to transmit consumer willingness-to-pay for public goods through the supply chain to incentivize sustainable management. In contrast, premiums for organic certification are similar in magnitude across retailer types. In general, failure to account for retailer heterogeneity will over- or under-estimate a label's premium.

Introduction

Product labels are important in many natural resource and food markets. Like other certification schemes, labels attempt to solve asymmetric information problems by signaling that the product or its production process has some intrinsic quality that is otherwise difficult for the consumer to observe. Some labels are affixed to impure public goods that provide both private benefits—e.g. taste, freshness and health—and public benefits that an individual consumer cannot fully appropriate—e.g. environmental sustainability and fair employment practices. We refer to these labels as eco-labels, recognizing that some of the public goods dimensions are social rather than environmental objectives.

A successful eco-label would be one that transmits consumer demand for a public good through the supply chain and, in so doing, creates incentives for sustainable practices or management. As a starting point, a label must be able communicate the sustainable practices of the firm and the associated private or public benefits. The label must then be able to verify credentials of certified firms. To transmit incentives, the links in this chain would be: (1) existence of consumer willingness-to-pay, (2) a positive price premium at the retail level (i.e. a higher retail price), (3) transmission of the retail premium from retailer to wholesaler, (4) transmission of the premium from wholesaler to producer, and (5) resulting changes in producer behavior toward more sustainable practices and/or producer support for sustainable management. Stated preference studies consistently find evidence for the first link in this chain. Consumers are willing to pay for a wide range of eco-labels that signal sustainably harvested fish and forestry products (Wessells et al., 1999; Johnston et al., 2001; Uchida et al., 2014; Aguilar and Vlosky, 2007), organically grown food (Bond et al., 2008; Lusk and Briggeman, 2009), fair trade (De Pelsmacker et al., 2005), and contains no genetically modified (GM) materials (Lusk et al., 2005). However, existence of willingness-to-pay for an eco-label is not a sufficient condition for a market premium (Sedjo and Swallow, 2002). There are open questions about whether retailers can capture willingness-to-pay

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and pass it along through the supply chain to the actors who ultimately affect sustainability.[1]

Although willingness-to-pay for eco-labels is well established in constructed markets, real consumers simultaneously choose where to shop, a bundle of other goods in conjunction with a labeled product, and a labeled or unlabeled product from a choice set with heterogeneous labels. This reality creates problems for measuring the second link in the chain that connects eco-labels to sustainability; real-world pricing of eco-labels may be influenced by retailer profiles and competition across labels. For instance, it may be that retailers choose premiums to attract people to the stores, and the eco-label premiums may to some extent reflect this phenomenon. While some studies find retail price premiums for eco-labeled products (Roheim et al., 2012; Sogn-Grundvåg et al., 2013, 2014), they do not account for potential supply chain diversity and implicitly assume that all retailers are identical. Two key aspects of this diversity are thus: (1) price premiums when consumers can choose among products with different eco-labels and (2) the potential for overall retailer profiles to obscure a label's price premium.[2]

Here we investigate whether actual retail prices vary across different eco-labels for salmon, and whether the eco-label premium varies by retailer. To quantify retailer price premiums, we use a unique data set of 6618 weekly price observations of a wide range of salmon products sold in eight UK retail chains. These prices are net of any in-store specials or discounts. In contrast to scanner data, which typically contain information on a limited number of product attributes that do not include eco-labels, our data allow us to access all product attributes, including two eco-labels, organic and Marine Stewardship Council (MSC) certified.[3] Though not an eco-label, we also control for country-of-origin (Scottish in our case) because there is evidence that consumers prefer domestic to imported products (Alfnes and Rickertsen, 2003; Lusk and Anderson, 2004). Not all stores carry every combination of product attributes. We assume throughout the analysis that all products compete in the same market; consumers are free to choose among the various products and retail outlets. Our results show substantial heterogeneity in eco-label premiums across retailers and across label type. We assume that products that are the same in every way except whether they contain the label have no product line cost differences, so differences in retail prices, controlling for all other attributes, are meaningful. These results raise new questions about the extent to which eco-labels can successfully transmit consumer willingness-to-pay for sustainability through the supply chain.

Background

The Food and Agriculture Organization of the United Nations (FAO) characterizes more than 50% of the world's fisheries as fully utilized and another 32% as overfished or recovering (FAO, 2011). The prevalence of overfishing and the globalization of the seafood trade raise concerns not only about whether fish stocks are currently poorly managed but also whether some seafood exporting countries have the institutional capacity to govern their resources effectively in the future (Smith et al., 2010). Certification programs for sustainably managed resources and eco-labeling potentially allow consumers a voice and thereby provide incentives for better resource governance (Wessells et al., 1999).

The most prominent eco-label in fisheries, at least in terms of the number of fisheries certified, is the MSC. The MSC label certifies fisheries according to three principles: sustainable fish stocks (i.e. avoiding overfishing), minimizing environmental impact (e.g. limit destructive fishing gear and bycatch), and effective management. Since the first capture fishery was certified as sustainable against the MSC's standards in 2000, the number of certified fisheries has grown to 189 as of January 2012 (MSC, 2013). Bioeconomic theory shows that a retail premium for eco-labeled fish is necessary to create incentives for sustainable management, but a premium is not a sufficient condition (Gudmundsson and Wessells, 2000). While recent studies find a retail price premium for the MSC label (Roheim et al., 2011; Sogn-Grundvåg et al., 2013, 2014), the label is not without its controversies. Given that certification is costly, a natural concern is that the MSC premium is insufficient to cover the cost. A more serious concern is that fisheries management is not necessarily improved in fisheries certified by the MSC label (Jacquet et al., 2010). MSC-certified products appear to be sustainably managed (Gutièrrez et al., 2012), but this correlation does not establish that the process of becoming certified actually caused the sustainable outcomes. Despite these broader concerns, here we focus on quantifying the retail price premium as a step toward understanding the role of seafood eco-labels in promoting sustainability.

A unique feature of the MSC label is that it applies to products from an entire fishery for a common-pool resource, not simply to products from a subset of the firms in an industry. That means that individual firms are not certified. Rather, it is the collective behavior of fishing firms in conjunction with fisheries managers that determine whether a fishery can be certified. This all-or-nothing approach to solving a commons problem and providing public goods at the same time (e.g. restricting the use of destructive fishing gear) raises questions about whose behavior the label purports to change and how the premium is transmitted to these agents.[4] Different fishing vessels often receive different prices for the fish that they land even in the absence of certification (McConnell and Strand, 2000; Lee, 2014; Asche et al., 2015). Given the individual basis of fish prices and the collective nature of certification, it is unclear how a premium can be transmitted to individual vessels, how they would perceive the premium, and how it maintains incentives at the individual vessel (firm) level. Skepticism about MSC was underscored in January 2012 as the leading Alaskan salmon processors and thereby the Alaska Seafood Marketing Institute withdrew from certification after the 2012 season (Intrafish, 2012; Alaska Seafood Marketing Institute, 2012).

Another controversy in the literature is whether eco-labels, including MSC, act as trade barriers and deny market access (Salzman, 2008). As discussed above (footnote 1), market access is equivalent to a price premium to the extent that sellers can earn more by accessing preferred markets. In developing countries, seafood eco-labeling raises questions about distributional consequences; when industrial countries insist on product labels, they may inadvertently privilege large producers over small ones, which may be unfair to small producers. In essence, because labeling

[1] Another motivation for eco-labels is market access, namely being able to sell products to certain countries, wholesalers, and retailers. On the surface, market access appears distinct from price premium, but it amounts to a similar incentive. A producer who is denied market access is unable to sell to the preferred market and instead must sell to the less preferred market. The preferred market is preferred by the seller because it is more profitable to sell in that market. The preferred market thus offers a higher price or a lower cost of doing business. Although we do not have data to explore the cost dimension, we have no reason to expect that doing business with different retail chains systematically varies by whether they are high-end or low-end retailers.

[2] In the stated preference literature, Onozaka and Thilmany McFadden (2011) investigate willingness-to-pay for, respectively, organic, fair trade, carbon footprint and production location and find different preferences for the different eco-labels. Moreover, while some combinations of eco-labels may enhance willingness-to-pay, others lead to a discount.

[3] Roheim et al. (2011) had to augment their scanner data with store observations to determine which products carried the MSC label.

[4] What constitutes a "fishery" can be a matter of discussion and further complicate the MSC label.