

Exporting Ecolabels: Is Demand for Certified Sustainable Products Affecting International Trade?

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Abstract

Sustainability certifications have become an increasingly common way for agriculture and natural resource industries to respond businesses' and consumers' demand for products that meet environmental standards. This article provides an examination of how sustainability certifications have influenced trade patterns in food and agricultural products. The authors conclude that demand for certified products may affect trade patterns in any of three main ways: by enhancing suppliers' access to export markets, by changing the product mix or import sources that consuming countries rely on, or by affecting the price at which products are traded. Case studies on MSC-certified seafood and RSPO-certified palm oil examine the evidence for such effects and find that certification can help producers grow or maintain their market share in developed countries.

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Introduction

In recent years, sustainability certifications have become an increasingly common way for agriculture and natural resource industries to respond businesses' and consumers' demand for products that meet environmental standards. One of the best-known examples of such programs is the Rainforest Alliance's certification of a variety of agricultural products grown in tropical countries worldwide, such as coffee and chocolate. These Rainforest Alliance-certified products feature the program's recognizable tree frog logo. When certification programs apply logos on consumer packaging, these are called "ecolabels."

The economic theory behind certification programs is that they give buyers access to information that they would not otherwise have about the products they are purchasing. This theory stems from work on the economics of information as pioneered by George Stigler. In the language of this theory, the environmental sustainability of the process by which a product is produced is a "credence attribute"—in other words, an attribute that consumers may care about, but that they cannot see, taste, or otherwise verify on their own.¹ Certification programs bridge the gap in information by enabling buyers to differentiate between conventional products and those which conform to defined sustainability standards. Buyers may then choose to "vote with their dollars" and purchase the certified product over other alternatives.² In cases where buyers are willing to pay a premium for certified products, this in turn increases the economic incentive for sustainable production.

There is a large body of literature on the rationale for sustainability certification programs and their effects on production and the environment. There is less information about whether and how these programs are affecting international trade patterns. Relatively little has been published about how much certified product is traded, or about whether demand for certified products is affecting exporters' access to foreign markets, importers' product sourcing decisions, or the prices at which items are traded. This paper examines how sustainability certifications have influenced trade in food and agricultural products through two case studies (on seafood and palm oil). First, we give background that includes a review of the literature on the development of sustainability certification programs, exploring the theoretical effects these certifications have on trade. Next, the case study on seafood considers the effects of Marine Stewardship Council (MSC) certification on export market access and prices. Finally, the case study on palm oil examines the volume of trade in Certified Sustainable Palm Oil (CSPO), export market access, importers' supplier mix, and prices. By providing context on the increasing importance of certification programs in global commerce and relating international trade data to the question of the effects of these programs, we aim to bridge the gap between international trade specialists and the sustainability community.

¹ FAO, "The Concepts of Standards," 2003.

² This idea is grounded in the concept of revealed preference, as pioneered by economist Paul Samuelson. In what was perhaps the first application of revealed preference theory to agricultural products carrying sustainability certifications, Arnot, Boxall, and Cash (2006) found that buyers of fair trade coffee in a coffee shop were less price sensitive than other coffee buyers.

The certification systems highlighted in this paper cover products that are produced and traded in global supply chains.³ These global supply chains involve producers, corporate customers, and end consumers. Commonly, supply chains for certified products arise in response to pressure that non-governmental organizations (NGOs) put on corporate customers in developed countries to address sustainability issues.⁴ In some cases, however, demand for certified products may originate with end consumers, or as a result of awareness of a sustainability problem among both corporate customers and end consumers. Producers, processors, or exporters may market certified products to either corporate customers or end consumers.

Stakeholders have various motives and incentives to participate in certified product supply chains rather than conventional supply chains.⁵ For producers and processors, price premiums and new or continued access to valuable export markets are the major reasons to participate in certified supply chains. The expectation of price premiums is often important because the costs that producers incur to become certified are frequently substantial. Such costs may include both the indirect costs of transitioning to production methods that comply with certification standards, as well as the direct costs of obtaining the certification. Corporate customers, by contrast, are often motivated by reputation and risk management as part of their corporate social responsibility (CSR) strategy. In some cases, sales of a certified product can offer opportunities to differentiate it in an otherwise stagnant market (this has been the case for certified coffee, for example). End consumers may be motivated to purchase certified products for a variety of reasons, including concern over particular sustainability issues or in response to efforts by producers or retailers to market the certification programs and their ecolabels.

Background on Sustainability Certifications

Sustainability standards addressing environmental and social concerns have emerged and evolved over the past few decades.⁶ For agricultural products, the first differentiated sustainability systems were developed in the 1960s with organic production. In 1988, fair trade certification emerged through a collaborative effort between Mexican coffee farmers and a Dutch development agency.⁷ These two

³ As defined by the USITC, “global supply chains are cross-border production networks joining multiple firms that supply interlinked economic activities that are needed to bring a product or service from conception to consumption.” USITC, *AGOA*, April 2014, 89.

⁴ See e.g., NRC, *Certifiably Sustainable?*, 2010, 14; Reynolds, Murry, and Taylor, “Regulating Sustainability,” 2007.

⁵ Barham and Weber, “The Economic Sustainability of Certified Coffee,” 2012; Dorr and Grote, “The Role of Certification,” 2009, 539-571; Henson, Masakure, and Cranfield “Do Fresh Produce Exporters?” 2011; Lemeilleur, N’Dao, and Ruf, “The Productivist Rationality,” 2015; NRC, *Certifiably Sustainable?*, 2010; Steering Committee, *Toward Sustainability*, 2012; Tallontire et al., *A Review of the Literature*, 2012; Van Loo et al., “Consumers’ Valuation of Sustainability Labels on Meat,” 2014; Rueda and Lambin. “Linking Globalization to Local Land Uses,” 2013.

⁶ See e.g., Daviron and Vagneron, “From Commoditization to De-Commoditization,” 2011, 91; Gibbon, *The Commodity Questions*, 2005, 17; Potts et al., *SSI Review*, 2014; Smith, *Developing Sustainable Food Supply Chains*, August 2007.

⁷ Fairtrade Foundation, “About Coffee,” <https://www.fairtrade.org.uk/en/farmers-and-workers/coffee/about-coffee> (accessed January 29, 2018).

successful early systems, sometimes called first generation certification programs, had largely distinct focuses: organic certification, which focuses on the environment, and fair trade certification, which focuses on labor and social impacts. By the 1990s, certification programs targeted at addressing specific sustainability challenges—such as overfishing and the destruction of tropical rainforest—also emerged.⁸

In the 2000s, sustainability certification programs became mainstream and proliferated.⁹ Currently, hundreds of certification programs and ecolabels exist, covering a wide array of products (agricultural and non-agricultural) and services in almost every country. The systems that have emerged encompass a broad range of approaches to environmental and social concerns. Many address both environmental and social issues, although often with varying levels of emphasis. With the expansion of approaches to sustainability, debate arises between stakeholders over what constitutes acceptable standards. Ultimately, the standards that are set for a certification system affect its credibility and success with stakeholders and customers, as does the reputation of the verification system.

Numerous organizational structures and types of certifying bodies have emerged with the proliferation of sustainability certification systems, as shown in table 1. Despite this, the vast majority are voluntary, although systems sometimes become de facto mandatory industry standards. Most programs are created by the private sector, including NGOs or businesses responding to pressure from them. Partnerships between different types of groups are not uncommon.¹⁰ Systems can focus on providing information on a product's origin or production methods to the end consumer (often through consumer-facing ecolabels), or solely on business-to-business transactions, which allows companies to ensure that their supply chain meets their sustainability criteria. The costs associated with obtaining certification vary by program and are usually borne by the producer, although they sometimes receive financial support from other stakeholders including NGOs, governments, or other businesses to offset or cover the costs of certification.¹¹

⁸ The MSC and Rainforest Alliance Sustainable Agriculture Network (SAN) were both established in 1997.

⁹ See e.g., Daviron, and Vagneron, "From Commoditization to De-Commoditization," 2011, 102-103; ISEAL, *The ISEAL 100*, 2011; Ponte & Cheyns, "Voluntary standards," 2013; Potts et al., *SSI Review*, 2014, 32; EcoLabel Index. <http://www.ecolabelindex.com/> (accessed August 16, 2016);

¹⁰ Unilever, a private company, and the World Wildlife Fund (WWF), a well-known NGO, have partnered to establish multiple certification systems, including the RSPO and the MSC. As can happen with some systems, MSC ultimately became an independent organization.

¹¹ NRC, *Certifiably Sustainable?*, 2010, 113; Tallontire et al., *A Review of the Literature*, 2012, 66.

Table 1: Key attributes of sustainability standards and corresponding example certification programs

Certification Attributes	Existing variations on the attribute	Select examples of certification programs conforming to each variation
Establishing body	Government	Indonesian Sustainable Palm Oil System
	Corporate customer	Starbucks' Coffee and Farmer Equity Practices
	Nongovernmental organization (NGO) or non-profit	Rainforest Alliance / Sustainable Agriculture Network (SAN)
	Corporate-NGO partnership	Roundtable on Sustainable Palm Oil (RSPO); Marine Stewardship Council (MSC)
	Public-private partnership	China Good Agricultural Practice (ChinaGAP)
Level of obligation for producers	Voluntary	The vast majority of certification programs, including RSPO and MSC
	Mandatory	A few government-led systems such as the Indonesian Sustainable Palm Oil System
Products covered	Single type of crop or food product	RSPO; MSC; Aquaculture Stewardship Council
	Multiple crops or food products	Rainforest Alliance; UTZ Certified; Global Good Agricultural Practice (GlobalGAP)
Buyers targeted	Corporate customers only (business-to-business certification program)	RSPO; GlobalGAP
	End consumers and corporate customers (usually includes use of a consumer-facing ecolabel)	MSC; Rainforest Alliance

Source: Compiled by authors based on literature reviewed for this article.

Note: Examples are for illustrative purposes only.

This paper addresses voluntary, private, third-party verified¹² certifications that are primarily focused on global environmental sustainability issues. Organic production is generally excluded from our analysis, but is occasionally mentioned in the literature review section as applicable. The case studies focus on two voluntary, private sector-led, environment-focused sustainability certification programs: the Marine Stewardship Council (MSC) and the Roundtable on Sustainable Palm Oil (RSPO).

Effects of Certification on Trade

This section will briefly review the theory and literature on how much certified product is traded and whether demand is affecting access to export markets, sourcing decisions, or prices. The topics are then addressed in greater detail in the seafood and palm oil case studies that follow.

¹² Third-party verified systems are those in which an independent body with no financial ties to the certifying body or the producer assesses conformity to standard. While not the focus of this paper, other certification programs exist that are either first-party verified (i.e., producers or companies put their own systems in place without outside verification) or second-party verified (i.e., the buyer or another interested party confirms that producer conforms to the standard)

Estimating the Volume of Trade in Certified Products

International trade data generally do not provide any indication of whether the products being traded are certified. As a result, any statistics about trade in certified products tend to be estimates based on other types of data that are more available, such as production data. Such data are indirectly related to trade, because the majority of certified production worldwide is exported.¹³ This is because production of many certified products, such as coffee, cocoa, and palm oil, occurs mainly in developing countries, while demand for certified products is primarily in developed countries—particularly Europe, but also other developed countries such as the United States, Canada, and Australia (or in the global production facilities of companies headquartered in these countries).

Production of certified products has grown rapidly in recent years. In 2012, production of a group of certified products examined in the State of Sustainability Initiatives Review (SSI Review) grew by 41 percent, compared to 2 percent growth for non-certified production of the same commodities.¹⁴ This rapid growth in certified production is evident at the individual product and certification level as well, as seen in table 2.

Table 2: Share of global production carrying sustainability certifications (percent), 2008–15

Product	2008	2012	2015
Coffee	15	40	unknown
Cocoa	3	22	unknown
Tea	6	12	20*
Palm Oil (RSPO only)	3	15	21
Wild-caught seafood (MSC only)	3	7	10
Seafood (all aquaculture and wild catch certifications)	3	12	14

Sources: Potts et al., *SSI Review*, 2014; Potts et al., *Standards and the Blue Economy*, 2016.

* Estimated.

Because many certifying bodies keep data on the level of total production meeting their standards, such as the data shown in table 2, some literature estimates international trade values based on these figures. For example, based on production values, the SSI Review estimated that the total trade value of a selected group of certified agricultural and forestry products was around \$32 billion in 2014.¹⁵ This figure corrects for multiple certifications that may apply to the same product, but it does not account for the fact that some certified production is not actually sold as certified in international markets, and is instead sold as a conventional product.¹⁶

¹³ Potts et al., *SSI Review*, 2014, 8, 93.

¹⁴ Potts et al., *SSI Review*, 2014, 8.

¹⁵ Potts et al., *SSI Review*, 2014, 8. Products covered were bananas, biofuels, cocoa, coffee, cotton, forestry products, palm oil, soybeans, sugar, and tea.

¹⁶ Potts et al., *SSI Review*, 2014, 95–96.

In some instances, however, it is possible for production of certified products to grow quickly enough that supply exceeds demand. In fact, for the group of products examined in the SSI Review, only one-third to one-half of certified production was sold as certified.¹⁷ Excess supply has particularly been an issue in recent years for certified palm oil, for example. In cases where supply exceeds demand, production data are not a good proxy for the value of products actually sold as certified in international markets. Our case study generates an estimate of trade in palm oil actually sold as certified; we do not find other estimates of such trade in existing sources.

Producer Access to Export Markets

The potential trade-related effect of certification that we are able to examine most closely is a shift in where producers send their products. This effect is often cited by certification programs, which promote producers' ability to access new export markets (or better meet demands in existing markets) as a benefit of the programs. As demand for certified products grows in Europe, the United States, and other developed countries, certification may be required for producers to gain or retain access to these markets. For example, Henson, Masakure, and Cranfield found that GlobalGAP certification increased Sub-Saharan African fresh produce exporters' sales by an average of €2.6 million and that the certification was increasingly essential in gaining or maintaining access to the European market.¹⁸ In a study of 50 coffee farms in Kenya and Central America, the Committee on Sustainability Assessment (COSA) found that about 54 percent reported improved access to export markets due to their participation in one or more certification programs.¹⁹ Market access (defined here as an enhanced ability to maintain or improve one's share in existing export markets or to export to new markets) is also one of the main benefits reported by fisheries participating in the MSC certification program, as described in greater detail in the case study.

Changes in Importers' Supplier Mix

Just as demand for certified products may open up new export markets for producers, it may also change the mix of countries from which buyers choose to import their products. This effect is related to market access effects for exporters, but it is not precisely synonymous because, for example, an importing country may choose to rely more heavily on an existing source after it becomes certified. As a result, the top export destinations for the producing country may not change much, but the importer may source products from a less diverse mix of countries. For example, if all of a country's coffee retailers make a commitment to source only coffee from producers who are certified, imports from countries that do not have any certified producers will cease.

While there does not appear to be any existing literature on this effect, a country for which import data might show such a trend is the Netherlands. The Netherlands has particularly strong demand for

¹⁷ Potts et al., *SSI Review*, 2014, 8.

¹⁸ Henson, Masakure, and Cranfield, "Do Fresh Produce Exporters?" 2011.

¹⁹ Giovannucci et al., "Seeking Sustainability," 2008.

certified products, and has committed to sourcing 100 percent of its cocoa, seafood, and palm oil for its domestic consumption from certified sources. As it implements these commitments, imports will likely favor countries that have higher concentrations of certified producers. To see if the trade data provided any evidence for this so far, we examined the Netherlands' import data for cocoa. The results of this analysis are provided in the box, "Sustainability commitments and the Netherlands' import sourcing."

Sustainability commitments and the Netherlands' import sourcing

In considering whether demand for certified products affects import sourcing, we looked at the trade data for the Netherlands' cocoa imports between 2007 and 2015. In 2010, Dutch cocoa users signed a letter of intent stating that all domestic consumption would be from certified sustainable sources by 2025. Examining the Netherlands' import data for cocoa beans, paste, and unsweetened cocoa powder, we can observe that this commitment has already had a small effect on import sourcing. We note that while the Netherlands is a major market for cocoa, it is also a common entry point for imports intended for the rest of Europe. Thus, any effect we find may be understated, since we cannot separate just those imports intended for the domestic market for which the commitment was made.

The largest suppliers to the Dutch market have not changed. The Ivory Coast and Ghana were by far the largest suppliers prior to 2010, and they continued to be so after 2010. These two countries produce both certified and non-certified cocoa in very large volumes, with somewhere between 16 and 30 percent of production carrying certification in each country. In both countries, Netherlands-headquartered UTZ Certified is the most common certifier, followed closely by Rainforest Alliance. Hence, the two countries are likely able to supply a significant share of the Netherlands' growing demand for certified cocoa. In 2007, the two countries' combined share of the Dutch import market was 65 percent. In both 2014 and 2015, their combined market share was 57 percent.

However, trade data also suggest that while the major African suppliers have retained most of the Dutch import market and are able to supply much of the demand for certified cocoa, the Dutch industry has broadened its supplier base slightly to include countries that produce large amounts of certified cocoa relative to their overall production. Peru and the Dominican Republic stand out in this regard. Peru exported less than a half million dollars in cocoa to the Netherlands in 2007, but exports grew sharply starting in 2011 and reached nearly \$75 million by 2015, accounting for 3 percent of the Netherlands' cocoa import market. Similarly, exports of cocoa from the Dominican Republic to the Netherlands grew from \$12 million in 2007 to \$64 million in 2015. Both Peru and the Dominican Republic have among the highest shares of certified cocoa production, although exact shares are hard to calculate due to the number of producers that hold more than one certification. In the Dominican Republic, over 61 percent of production is UTZ certified, the highest in the world. About 52 percent is Rainforest Alliance certified. In Peru, about 43 percent of production is UTZ certified, the third highest share in the world, and 5 percent is Rainforest Alliance certified.

Overall, it is clear that the Netherlands' commitment to sourcing certified cocoa for its domestic consumption led to more imports from smaller cocoa-producing countries that have invested particularly heavily in certified production. While the Netherlands' overall import statistics have not changed dramatically, its diversification of suppliers likely represents a significant market access

opportunity for the exporting countries. The effect of exporters gaining additional access to export markets through certification is explored in more depth throughout this paper.

Sources: Potts et al., *SSI Review*, 2014; IHS Markit, GTA database; CBI Market Intelligence, "Cocoa in the Netherlands," February 2016.

Price Effects

Certification, through its potential impact on product values, may also affect the price at which products are traded. The existing literature, which is mostly focused on establishing the existence of price premiums and not specifically on traded prices, indicates that attempts to rigorously measure premiums have often produced little reliable data.²⁰ This is in part because even where premiums can be identified, other attributes besides certification, including quality, may be affecting them.²¹ Over time, price premiums within a system are likely to fluctuate, and the specific certifications²² attracting the highest premiums can shift.²³ Prices also vary along the supply chain, and finding a price premium may depend on whether producer prices, export prices, or consumer prices are considered. Most of the articles about price premiums for certified products focus on premiums paid either to producers or by end consumers—in other words, at both ends of the supply chain. There is less literature on how certification affects trade prices (i.e., export or import prices). The literature related to various types of prices is described below.

Producer price premiums

At the producer and processor level, where certification costs are incurred, there is often an expectation that certified products will generate price premiums for the producer.²⁴ Yet, the literature shows that producers and processors may not obtain such premiums in all cases. For example, a National Research Council paper examined a wide range of certification programs and concluded that most do not command a price premium (but noted that other benefits including market access and higher productivity can encourage certification).²⁵ Loconto and Dankers found that small producers (commonly

²⁰ Blackman and Rivera, "Producer-Level Benefits of Sustainability Certification," 2010; FAO, "The Concepts of Standards," 2003.

²¹ Loconto and Dankers, *Impact of International Voluntary Standards*, 2014.

²² Although not central to this paper, it is important to acknowledge that organic and Fairtrade (which for many products often overlap with other certifications) typically generate the largest premiums. However, the literature demonstrates that even the relatively high organic price premiums can be insufficient to offset the additional production costs associated with organic production. See, for example, Barham and Weber, "The Economic Sustainability of Certified Coffee," 2012.

²³ Barham and Weber "The Economic Sustainability of Certified Coffee," 2012; Dorr, and Grote, "The Role of Certification in the Brazilian Fruit Sector," 2009; Giovannucci, Byers, and Liu. "Adding Value," 2008; NRC, *Certifiably Sustainable?* 2010; Reynolds, Murray, and Taylor, "Regulating Sustainability in the Coffee Sector," June 2007; Tallontire et al., *A Review of the Literature*, 2012.

²⁴ Blackman and Naranjo, "Does Eco-Certification have Environmental Benefits?," 2012, 58; NRC, *Certifiably Sustainable?*, 2010, 113.

²⁵ NRC, *Certifiably Sustainable?*, 2010.

called smallholders) in the voluntary private certification programs they examined—including MSC, Rainforest Alliance/Sustainable Agriculture Network, and GlobalGAP—largely received no or minimal premiums.²⁶ Where producer premiums do occur, they can decrease over time. For example, a paper by Barham and Weber found that the price premium generated for coffee produced by a Peruvian cooperative and certified by the Rainforest Alliance fell from 10.4 percent of the market price in 2006 to 3.3 percent in 2008.²⁷

Other researchers, however, find some evidence of price premiums at the producer level.²⁸ A literature review by Tallontire et al. found that both the Rainforest Alliance and UTZ certifications, which do not provide pre-established premiums as part of the program, may generate higher producer prices.²⁹ It should be noted that the UTZ program requires that some premium be paid to producers. The specific premium, however, is negotiated by the buyer and seller, not by UTZ (unlike with the Fairtrade program, which sets specific premiums).³⁰ UTZ collects data on price premiums for its certified products at the point of first sale, and these data show premiums of 6 to 7 percent for coffee, 1 to 2 percent for tea, and 2.5 percent for cocoa in 2012.³¹ For seafood, research has been done evaluating the existence of price premiums using dockside prices paid to producers in Alaska and Japan, as compared to dockside prices for comparable non-certified products. Through this exercise, Stemle et al. determined that there was evidence of a price benefit from MSC certification for two Alaska salmon species and for a type of Japanese flounder. However, other Alaska salmon species and Alaskan halibut did not show evidence of a price benefit. Interestingly, the two Alaska salmon species that showed a price premium were significantly more likely than the other fish studied to be exported to European markets.³²

Buyer price premiums

Most of the research on price premiums paid by buyers focuses on the end consumer and finds some evidence of premiums. For example, there are a number of papers showing consumer price effects for MSC-certified fish, most of which measure the effect on retail prices in the UK market. In a 2011 article, Roheim et al. found a retail price premium of about 14 percent for MSC-labeled Alaska pollock products, using scanner data from the London market.³³ Similarly, Asche et al. found price premiums for MSC-labeled salmon products in certain UK retail markets, but not in others,³⁴ and Sogn-Grundvag et al.³⁵ found some evidence of consumer price premiums for MSC-labeled whitefish in the UK market. Beyond seafood, Van Loo et al. found that consumers' willingness to pay a premium for certified coffee varies by

²⁶ Loconto and Dankers, *Impact of International Voluntary Standards*, 2014.

²⁷ Barham and Weber, "The Economic Sustainability of Certified Coffee," 2012.

²⁸ Potts et.al, *SSI Review*, 2014; Rueda and Lambin. "Linking Globalization to Local Land Uses," 2013; Loconto and Dankers, *Impact of International Voluntary Standards*, 2014.

²⁹ Tallontire et al., *A Review of the Literature*, 2012, 65.

³⁰ Potts et.al, *SSI Review*, 2014, 77; UTZ, "Do UTZ Certified Farmers get Paid a Premium?" n.d.

³¹ Potts et.al, *SSI Review*, 2014.

³² Stemle et al., "Have Dockside Prices Improved After MSC Certification?" August 2015.

³³ Roheim et al., "The Elusive Price Premium," 2011.

³⁴ Asche et al., "Pricing of Eco-Labels with Retailer Heterogeneity," 2015.

³⁵ Sogn-Grundvag et al., "Product Differentiation with Credence Attributes and Private Labels," December 2013.

label. For the four labels the paper examined, they found that consumers were willing to pay a premium of \$1.16 per 12-ounce bag of coffee for organic certification, \$0.84 for Rainforest Alliance, and \$0.68 for Fairtrade. Consumers were not willing to pay a significant premium for the Carbon Footprint certification.³⁶

A Rueda and Lambin article on Rainforest Alliance certified coffee from Colombia presents a rare look at corporate buyers, or those in the middle of the supply chain – in this case, coffee roasters.³⁷ They found that roasters do not transfer cost of the premiums they've paid for certified beans to the customer. Rather, roasters use certification as a marketing strategy to appeal to consumers on environmental and social grounds in order to obtain or maintain market share.³⁸ Other corporate buyers appear to use certified sustainable purchasing in this manner.³⁹ Given these facts, we speculate that corporate customers sometimes absorb price premiums paid to exporters or importers for other certified products when they cannot pass them to consumers. Evidence of this for exporters may be apparent in the import price for some certified products.

Trade price premiums

Given the questions about price premiums for certified products in the existing literature, it is perhaps not surprising that effects of certification specifically on export and import prices are difficult to discern. Particularly in those cases in which it is not clear where in the supply chain the price premium is absorbed, it is difficult to determine with certainty whether the export or import price is affected. For instance, retailers may charge consumers a price premium after importing certified products even though they did not pay a premium on the imports, or vice versa (as described in the case of coffee roasters above).⁴⁰

One paper looking at export price effects is by Kariuki, Loy, and Herzfeld, who found that GlobalGAP certification had a positive effect on the export prices of French beans shipped from Kenya to the EU, but that other characteristics of suppliers (such as participation in supply contracts) had a larger effect.⁴¹ Another article by Lallemand et al. compared export prices for MSC-certified hake to prices for

³⁶ Van Loo et al., "Sustainability Labels on Coffee," 2015.

³⁷ Rueda and Lambin. "Linking Globalization to Local Land Uses," 2013.

³⁸ Rueda and Lambin also found that (1) the price premiums varied over time and were counter-cyclical to international prices (2) Colombian farmers do not secure a guaranteed or set price premium when participating in the RA's certification program but they do enjoy less price volatility than producers of mainstream coffee, and (3) producers and exporters in the certified supply chain captured more of the perceived customer values than mainstream or high-quality single source supply chain (although this was in percent term and not dollar terms).

³⁹ UNCTAD, *Corporate Social Responsibility in Global Value Chains*, 2012.

⁴⁰ Even without price premiums other economic benefits related to certification may encourage producers to participate in certification systems, including market access, price stability, and higher productivity which can lead to higher incomes.

⁴¹ Kariuki, Loy, and Herzfeld, "Farmgate Private Standards and Price Premium," 2012.

uncertified hake and found that the certification both resulted in a higher export price and was important to retaining market access.⁴²

Case Studies

Our case studies examine whether demand for certified seafood or palm oil generate any effect on international trade patterns and prices. As discussed above, demand for certified products could affect trade patterns in one or more of a few key ways: by changing the export markets that a producer is able to access, by shifting the preferred sources of supply, or by affecting the price at which the product is traded. Both case studies highlight the ways in which certain types of MSC-certified seafood and RSPO certified sustainable palm oil (CSPO) are intermediate inputs in the global supply chains of multinational companies, and this affected our assessment. There are challenges related to examining the effects of demand for certified products when that demand is driven by business-to-business transactions. Such transactions often have intermediate steps, such as third-country processing or transshipment, that complicate the use of trade data collected on a country level. As a result, as highlighted in the seafood case study, an examination of bilateral trade flows between the producing country and the consuming country may not always reveal a trade effect, even when one exists. For some products, trade flows through third countries may also have to be examined to determine if certification affected trade patterns. For CSPO, the concentration of corporate customers committed to using certified product serves as indicator of country demand.

Our examinations of the effects of certification on trade patterns for seafood and palm oil were also influenced by various characteristics of the certified product industries, including the time period over which certifications were implemented, demand for the product relative to supply, and the data available. The first case study uses trade data for MSC-certified fisheries, comparing pre- and post-certification periods. Demand for MSC-certified seafood exceeds supply; this means that, unlike for palm oil, most certified seafood is purchased by buyers seeking the certification. Examining trade effects for CSPO was more challenging for a few reasons. First, the program was adopted gradually over a long period. Second, physical trade in CSPO has been limited because of the prevalence of traded CSPO certificates that operates similarly to a carbon trading system. Third, supply of CSPO exceeds demand, so some of the certified oil produced ends up being sold as conventional product. For these reasons, additional data sources, which are limited, were necessary in order to evaluate trade effects.

Case study: MSC-certified Seafood

Global seafood market overview

Global seafood demand is growing rapidly, driven in part by growing middle class populations in developing countries and the associated increase in demand for higher value, protein-rich food products such as meat and fish. Between 2013 and 2015, global seafood exports averaged \$101 billion, up from

⁴² Lallemand et al., “Estimating the Economic Benefits of MSC Certification,” March 2016.

\$37 billion in 2000.⁴³ As many wild fish stocks have declined, aquaculture has come to account for a growing share of seafood production and in recent years, has accounted for about half of total seafood production.⁴⁴ Between the 1980s and 2009, production of seafood from wild capture fisheries was roughly flat, while aquaculture production rose rapidly. As a result, growth in aquaculture accounted for nearly all of the doubling of total seafood production volume that occurred during that period.⁴⁵ About 80 percent of seafood production occurs in the developing world, with China by far the world's largest producer.⁴⁶ The seafood species that feature most prominently in global trade include shrimp, salmon, tuna, Alaska pollock, sardines, tilapia, and catfish-like species.⁴⁷ Shrimp and salmon may be either farmed or harvested from the wild, while tuna, Alaska pollock, and sardines are wild-caught. Tilapia and catfish-like species are usually farmed.

The Role of MSC Certification in the Market

The main reason for flat global production of wild-caught seafood in recent years is low supply of certain species due to overfishing. Demand for seafood certified to sustainability standards emerged in the 1990s, as the decline of some prominent fisheries, such as Atlantic cod, led to greater awareness of this problem. The largest and most well-known fisheries certification program is administered by the Marine Stewardship Council. The MSC was established in 1997 through a partnership between the World Wildlife Fund (WWF, an environmental NGO) and Unilever (a food company that was a major buyer of seafood at the time—it has since sold most of its seafood business).

Since that time, two other wild-catch certification programs that are somewhat similar to MSC in their scope and the way the programs operate have been established.⁴⁸ There are also prominent global programs that cover only aquaculture. Beyond these certification programs, seafood buyers may encounter other label sustainability claims in the marketplace. In particular, some NGOs such as the Monterey Bay Aquarium and Greenpeace issue recommendations about which seafood products to purchase or avoid based on sustainability criteria, and although these are not certification programs, they sometimes incorporate ratings (such as Monterey Bay's "traffic light" green, yellow, and red labels, indicating which fish to seek, limit, or avoid entirely) that can look similar to the end consumer. MSC certification, however, is the program with the broadest recognition in global markets, and the program

⁴³ IHS Markit, Global Trade Atlas database (accessed September 12, 2016)

⁴⁴ NOAA Fisheries, "Basic Questions about Aquaculture," http://www.nmfs.noaa.gov/aquaculture/faqs/faq_aq_101.html (accessed July 19, 2017).

⁴⁵ World Bank, *Fish to 2030*, 2013, 5.

⁴⁶ Potts et al., *Standards and the Blue Economy*, 2016, 12.

⁴⁷ Anchovies are also among the most commonly harvested and traded products, but they are mostly intended for use in fish feed, fish oil, and industrial products rather than for direct human consumption.

⁴⁸ These programs are Naturland and Friend of the Sea, both of which certify both wild catch and aquaculture. Friend of the Sea accounts for as much of the total supply of certified wild catch as MSC, but most of this is Peruvian anchovy, which is used to produce fish meal and retail and consumer awareness of the standard is low. Potts et al., *Standards and the Blue Economy*, 2016, 31.

where impacts on trade flows from demand for certified products might most reasonably be observed. As a result, the remainder of this case study will focus on MSC-certified products in international trade.

The MSC issued its first certifications in 2001, to the Alaskan salmon fishery and an Australian lobster fishery, and has since grown to encompass 312 fisheries and about 3,300 entities qualified to handle certified fish under its chain of custody certification (see box, “What is a fishery?”). The largest certified fishery is the U.S. Alaska pollock fishery, and this helps make the United States the largest producer of MSC-certified seafood (accounting for 30 percent of global MSC-certified production). Unlike the U.S. Alaska pollock fishery, however, many certified fisheries are very small and produce for niche markets. As a result, the number of fisheries and countries participating is large and diverse, although as previously mentioned, developed countries’ producers account for the majority of certified production.

Production from MSC-certified fisheries has grown rapidly since the program was created, as more fisheries have sought certification to meet demand for sustainable products. Between 2008 and 2015, MSC-certified production grew from 2.8 million metric tons (mt) to 9.2 million mt.⁴⁹ While consumer awareness of the MSC label—and of seafood sustainability more broadly—has grown in recent years, retailers and processors generally play a larger role than consumers in generating demand for certified seafood products.

Much of the demand for certified seafood comes from European retailers and processors. In this way, seafood sustainability certification is similar to many of the certification programs for other products, which have been driven by European demand. Some important retail sector participants, such as the UK’s Sainsbury’s chain, Germany’s Lidl, and the entire Dutch food retail industry, made early commitments (between 2003 and 2007) to source exclusively from MSC-certified fisheries, increasing demand for sources of certified supply. The MSC cites the example of Lidl requesting certified herring, but none was being produced at that time, so Lidl’s demand sent a signal to herring producers that they should become certified.⁵⁰ Later, retailers with global reach, such as McDonald’s and the French chain Carrefour, made similar commitments to source MSC-certified products.

What is a “fishery?”

In simplest terms, a fishery is a single, coherent unit of production for wild-caught fish. This usually means a “combination of fish and fishers in a region, with the latter fishing for similar or the same species with similar or the same gear types.” The more technical definition published by the FAO states that a fishery may be defined in terms of some or all of the following: “people involved, species or type of fish, area of water or seabed, method of fishing, class of boats, and purpose of the activities.” Thus, two groups of fishers that target the same species, in the same region, but using different gear types (for example, nets versus lines) may not be part of the same fishery. This definition is important to understanding MSC certification since the program requires that any applicant for certification represent a properly defined fishery.

Source: NOAA, “Fisheries Glossary,” June 2006.

⁴⁹ Potts et al., *Standards and the Blue Economy*, 2016, 20.

⁵⁰ MSC, “Sustainable Seafood: The First 20 Years,” April 25, 2017.

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As retailer commitments to sourcing MSC-certified products have grown, they have begun to expand beyond northern Europe. U.S. retailers have increasingly made MSC certification a part of their corporate sourcing considerations, although many of these commitments are less stringent than those in Europe, in that they prioritize buying MSC-certified products, but stop short of exclusively or primarily carrying them. U.S.-based retailer Walmart, the largest in the world, committed in 2006 to buying 100 percent of its wild-caught seafood from MSC-certified sources, but later relaxed its policy to include additional acceptable certifications and fisheries that are on a path to becoming certified.⁵¹ Nevertheless, Walmart's scale ensures that its purchases are a major source of demand for MSC-certified products. Similarly, Whole Foods Market, another leading U.S. retail outlet, has a seafood sourcing policy that contributes to demand for MSC-certified products by favoring the products where possible, but it also accepts seafood on the basis of certain other criteria.⁵² More recently, Kroger and Ahold Delhaize, the two largest supermarket chains in the United States, have implemented seafood sourcing policies that explicitly seek to increase the amount of MSC-certified seafood in their stores.⁵³ The United States has become an important market for MSC-certified products as a result of all of these retailers' policies.

In general, demand for certified seafood exceeds supply. As a result, more seafood producers are seeking certification, in order to supply unmet demand. There are currently 68 fisheries that are undergoing the assessment process that precedes certification. If they become certified, these sources of supply will add to production from the 312 fisheries that are certified at present.⁵⁴

It is clear that demand for certified seafood is concentrated in developed countries, driven primarily by those countries' retailers' commitments to sustainability standards. It is perhaps more surprising that supply of these products is concentrated in developed countries as well. Most of the certified fisheries, as well as the fisheries undergoing assessment, are in developed countries. In 2015, developed country sources accounted for about 89 percent of MSC-certified seafood supply (figure 1). This is mostly due to the underlying fisheries management programs put in place by governments in developed countries, which make meeting MSC standards less of a change from practices already in place,⁵⁵ lowering the costs and preparatory work needed to get the fishery to those standards.

⁵¹ Undercurrent News, "Walmart Expands Acceptable Certifications," January 24, 2014; Walmart website, <http://corporate.walmart.com/policies> (accessed November 1, 2016).

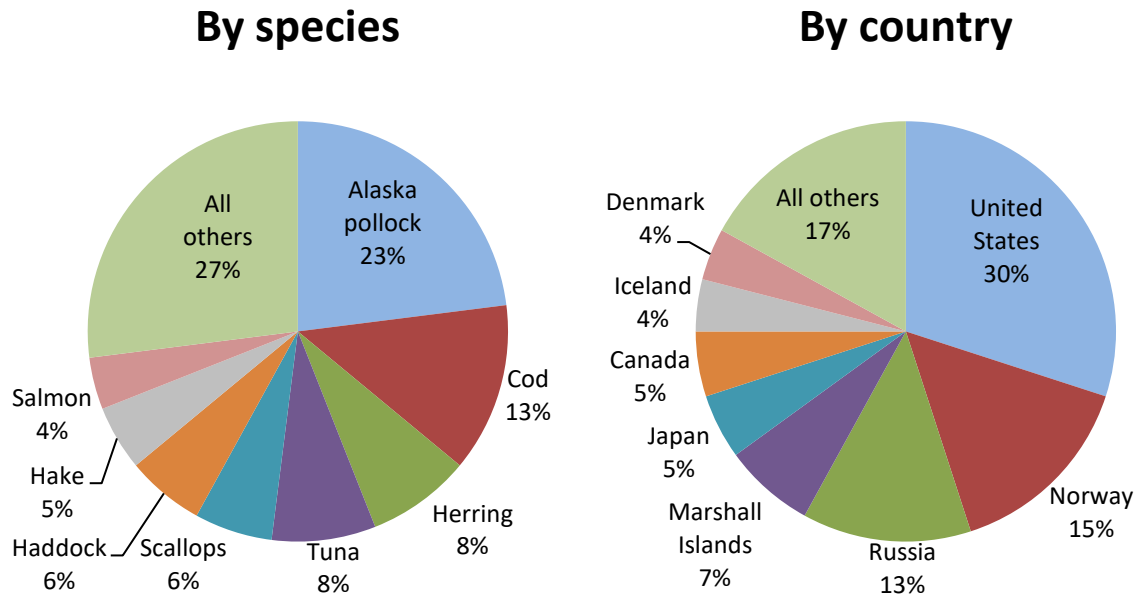
⁵² Specifically, Whole Foods' policy states that seafood from the Green and Yellow lists published by the Monterey Bay Aquarium are acceptable in addition to MSC-certified products.

⁵³ Kroger specifies that for the top 20 most heavily consumed seafood species, products that are wild-caught must come from fisheries that are MSC-certified or in assessment to become MSC-certified (Kroger website, "High-Impact Commodities," <http://sustainability.kroger.com/supply-chain-high-impact-commodities.html> (accessed July 19, 2017). Ahold Delhaize, which owns Food Lion, Giant, and Stop and Shop stores in the United States, reports annually on progress toward sourcing more of its seafood from MSC-certified sources (Ahold Delhaize, *Better Together*, 2016).

⁵⁴ MSC website, "The MSC in Numbers."

⁵⁵ Potts et al., *Standards and the Blue Economy*, 2016, 25.

Figure 1 MSC-certified catch by species and country of origin, 2015



Source: Potts et al., *Standards and the Blue Economy*, 2016.

How demand for MSC products may affect trade

As described above, demand for certified products may affect international trade flows by providing market access to certified producers, changing the mix of countries an importer is willing to import from, or increasing the export or import price. For seafood in particular, we would expect the market access effect to be particularly strong because it is the change most often reported by the MSC program itself and it is the most straightforward to observe. Effects on importers' supplier mix would be very difficult to test for with seafood because the universe of certified seafood products includes numerous, distinct species and product forms, and the degree of substitutability between seafood products is not well understood. Examining this trade effect works better with products that have fewer substitutes, like the cocoa example presented in the introductory section. On price, demand for certified seafood is known to exceed supply, so we might expect to see some effect on export and import prices.

Evidence of these trade-related effects may be anecdotal or apparent in the data.⁵⁶ The main source of anecdotal evidence about the effects on trade is the MSC itself, which publishes information on the results of certification, mostly through its *Net Benefits* report.⁵⁷ Often, this information includes

⁵⁶ There is at least one other way that demand for certified products could affect seafood trade, but it would be more difficult to observe: such demand may affect the overall mix of seafood products exported, particularly to developed countries. There are many species for which there is currently no source of certified supply. If there is a close substitute among certified products, export markets that value certification may shift some of their purchases to the certified species and away from the non-certified one. Because it would be difficult to observe this trend from global trade data, it is not examined further in this paper.

⁵⁷ MSC, *Net Benefits*, 2009.

interviews from producers in certified fisheries, who describe the benefits they've experienced after gaining certification and often emphasize market access. A few examples of the trade-related benefits cited by producers include:

- For North Pacific albacore tuna, producers stated that certification allowed them to differentiate their product from the rest of the tuna market, leading to higher prices, increased sales in Europe, and exports to additional European countries that they had not previously shipped to.
- For North Sea herring, producers stated that certification opened up new markets, particularly in the Netherlands, where all supermarkets committed to source all of their fish from MSC-certified sources.
- For Pacific cod from Alaska, producers stated that certification allowed them to move from selling salted cod, primarily to southern Europe, to selling more value-added cod products (such as battered and breaded fish) to markets like the United Kingdom (UK), and that the price premium for certified cod may be as high as 3 percent.
- Similarly, for Alaska pollock, producers credited certification for enabling them to increase Alaska pollock's share of the UK whitefish market and retain access to segments of the UK grocery market that made commitments to sourcing from MSC-certified fisheries.

An additional source of anecdotal information on trade-related effects from certification is the case studies found in the book *Seafood Ecolabelling*, which found little trade effect in the Baja California lobster fishery, but some effects in the Alaska pollock fishery. In the Mexican Baja California lobster fishery, producers had hoped that certification would help them access new export markets, but this did not happen because the small volumes and particular product forms demanded by markets that valued certification did not make for a better market opportunity than existing export markets in Asia. However, similar to what the MSC reports for Alaska pollock, the authors find evidence that certification enabled this fishery to gain visibility and market share in Europe, particularly for battered products sold by European retailers. The case study notes, however, that this benefit came at relatively high cost to producers.⁵⁸

Examining evidence of effects in trade data

Building on the existing literature, this case study examines international trade data in order to provide evidence as to whether demand for certified seafood is affecting global trade, either by providing or securing access to export markets or by increasing the price at which seafood is traded. On price, the method we use is somewhat similar to the one used by Stemle et al. in the article described in the introductory section, in that it compares prices after certification to a set of control prices.

Only certain fisheries are suited to the analysis described below. In order to have usable data, a fishery must generally be associated with a producing area that is large enough to have trade data available. Usually, this means that producers in an entire country or customs territory (or the entire portion of the country that produces the certified species) must be eligible for the certification. For example, in the

⁵⁸ Ward ed., *Seafood Ecolabelling*, 2008, 285.

United States, Alaska accounts for a large majority of the production of Alaska pollock and Pacific salmon. As a result, the MSC-certified fisheries in that state account for nearly all U.S. exports of those species, and thus U.S. trade data for those fish may be used.

The second requirement for the analysis is that the fish species certified have its own 6-digit HS subheading. If it does not, then the trade data for the species are not harmonized internationally, rendering it nearly impossible to use. Thus, from a list of 312 certified fisheries, there are just a few dozen that have trade data specific enough to both a customs area and a species to permit analysis.

For this subset of fisheries, we use data on the value, volume, destinations, and unit value of exports of the certified species from the country associated with the certified fishery, in the 3 years prior to certification and in each of the years since. In order to help determine whether there is a trade price premium for certified products, data for average unit values (AUVs) of exports (a proxy for price) from the 5 largest global exporters of the species during the same time period are also useful.

To gain insight into trade price effects, the AUV for exports in the 3 years prior to certification is calculated and then compared to the export AUV in the 5 years after certification (or as many years as are available, for more recently certified fisheries). To avoid capturing normal price fluctuation, this change in prices is then compared to the same data for a group of the 5 largest exporters of the product (or the other 4 of the top 5, if the certified producers' country is in the top 5). If the price increases more for the country associated with certified exports, or if it decreases less, or if it increases while other countries' export unit values are decreasing, then this may suggest a price premium for certification in export markets.

Export AUVs should be used with caution, as they are not always a precise indicator of price, and there are several reasons why they may not tell the whole story. Because trade data at the 6-digit HS level is still fairly aggregated, there can be substantial variation in products carrying the same HS classification. Some countries may specialize in variations of the product form that are not directly competitive with other countries' products sharing that classification. For example, various species of Pacific salmon share the same 6-digit HS subheading, even though some species (such as King salmon) are of much higher value and are not directly substitutable with other species (such as pink salmon).

Table 3 shows results from the analysis. For 4 of 7 fisheries analyzed, export data do not suggest a significant price premium for certified products. One of the products for which the data do suggest an export price premium is processed anchovies from Argentina. In that case, Argentina's export AUV increased about 22 percent between 2012 and 2015, while the top 5 exporters' export AUVs increased just 3 percent (Argentina is the world's 11th-largest exporter). This better-than-average price performance may be due to other quality factors that do not relate to certification, or it may be directly related to the ability to market the product as certified. The other two products for which a possible price premium was observed were Patagonian scallops and Chilean mussels. For Chilean mussels, the finding is somewhat inconclusive due to the fact that certification was very recent (February 2014), so limited post-certification data are available.

Table 3 shows mixed evidence that certification may change the export markets a producer is able to access, with certified fisheries’ producers exporting more to developed country markets in the years after certification in 5 of the 9 fisheries. This is consistent with most of the existing literature, particularly the anecdotal evidence put forth by the MSC, but the effect does not seem to be quite as strong in the trade data as the literature would suggest.

Table 3: Results of analysis of trade data for potential effects from MSC certification

Fishery Origin	Species	Date certified	Increase in export AUV compared to world?	Increase in exports to developed markets?
Chile	Mussels	Feb 2014	Yes	Yes
Patagonia (Argentina)	Scallops	Dec 2006	Yes	Yes
Argentina	Anchovy (processed)	Aug 2011	Yes	No
U.S. (North Atlantic)	Swordfish	Mar 2013	No	Yes
Australia	Rock lobster	Mar 2000	No	Yes
Alaska	Pacific salmon	Sep 2000	^a	Yes
Alaska	Alaska pollock	Feb 2005	^b	No
Fiji	Albacore tuna (longline)	Dec 2012	No	No
Argentina	Anchovy (fresh/frozen)	Aug 2011	No	No

Source: IHS Markit, GTA database (accessed October 23, 2017).

^a Prices cannot be analyzed using export AUVs because changes in 2002 to the way salmon is classified in the Harmonized System preclude comparison between time periods.

^b Prices cannot be analyzed using export AUVs because the United States is one of only two major global producers, so sufficient control country data are not available. However, some information on price effects using industry figures is presented in the analysis below.

It is clear that international trade data can provide an initial indication of the trade effects resulting from the entry of certified products on the global market, but more analysis or additional data are often needed to build a more complete picture. Such analysis is provided in the next section for the three fisheries for which information was most readily available. For Fiji albacore and Alaska pollock, looking at exports directly to developed markets failed to capture exports to third-country processors who were integral to getting the certified product into those markets. Similarly, while export AUVs of the most common form of the certified product did not suggest any price effect for Fiji albacore (as indicated by the “no” in the table), further analysis revealed that certification allowed Fiji to become a new exporter of a higher value form of the product. Additional information on Alaskan salmon is provided as an example of where trade data more directly show certification-related effects.

Alaskan salmon

The data for Alaskan salmon reveal a fairly straightforward story. Because Pacific salmon is most often sold as a fresh or frozen product, without additional processing such as breeding, there are few third-country effects, unlike with the other products described below.⁵⁹ As shown in the chart, price effects could not be observed using export AUVs due to differences in the way Alaskan salmon was classified in the Harmonized System before and after 2002. However, certification appears to have been associated with an increased share of exports being sent to the EU. In the three years prior to certification, the

⁵⁹ Some salmon is canned, but the canning industry for salmon is mostly in Alaska rather than in third countries.

United States sent just under 14 percent of its fresh, frozen, and canned Pacific salmon to the EU. In the five years after certification, that share rose to just over 17 percent.

The most striking change, however, was the decline in the share of U.S. exports being sent to its largest market, Japan. The share of U.S. Pacific salmon exports sent to Japan fell from an average of 74 percent in the three years before certification to an average of 52 percent in the five years after. An increased share of U.S. Pacific salmon exported to the EU probably turned out to be a valuable hedge for Alaskan salmon producers due to other changes that have occurred in the Japanese market that were not related to certification. The overall Japanese salmon market has shrunk, and the United States has faced increasing competition in that shrinking market. Most notably, in the 1990s, Chile entered the Japanese market with its farmed coho salmon, a Pacific species which Chile began to farm exclusively for the Japanese market.⁶⁰ While this change would have occurred whether or not the Alaskan salmon fishery pursued MSC certification, it is possible that the certification allowed U.S. producers to gain recognition in the EU market, which favors certified products, and thus continue to grow export levels even as the Japanese market for U.S. salmon declined.

Fiji albacore tuna

The examples of Fiji albacore tuna and Alaska pollock discussed next underscore the importance of major purchasers' supply chain decisions in determining how export patterns may change post-certification. As presented in table 3 above, trade data for frozen, whole albacore (the product form most commonly exported from Fiji) did not show that certification was associated with a higher share of Fijian albacore sent to developed countries or increase in export AUVs. The story behind these data, however, is significantly more complex.

The Fiji longline albacore tuna fishery became MSC certified in 2012, at the conclusion of a certification process that received technical and financial assistance from the EU.⁶¹ Immediately after the fishery achieved certification, a new market for the certified product opened up—in 2013, the global tuna brand Bumble Bee launched its conservation-focused Wild Selections line of canned tuna.⁶² The brand is committed to using only MSC-certified fish and donates a portion of the proceeds from the product line to WWF, which collaborated with Bumble Bee on tuna sustainability prior to the brand launch.⁶³ Relatively little of the world's tuna supply is MSC certified, and the certified Fiji fishery became the sole supplier of albacore for Wild Selections products. The results of the trade data analysis presented in table 3 for this fishery must therefore be considered in light of the additional context of its new connection to a specific brand's supply chain. After certification, exports of albacore to Thailand—where the Wild Selections line is packed—increased quickly, from an average of \$1.9 million in the 3 years

⁶⁰ Knapp, "Overview of World Salmon Markets," 2007.

⁶¹ The Fish Site, "Fiji's First MSC Certified Sustainable Albacore Tuna Fishery," December 13, 2012.

⁶² Canned salmon, sardines, and shrimp were later added to the line.

⁶³ WWF, "Bumble Bee Foods: Wild Selections," <https://www.worldwildlife.org/projects/bumble-bee-foods-wild-selections> (accessed October 3, 2017).

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before certification to an average of \$6.3 million in the 3 years after.⁶⁴ The connection with the Wild Selections brand, which is primarily sold in the United States, should provide the Fijian fishery with a reliable source of sales to the U.S. market, but Thailand's role as the intermediate processor in the supply chain prevents this effect from being apparent in the trade data.

In terms of export values, despite the fishery's stated hope that certification would increase prices,⁶⁵ and the fact that the Wild Selections brand retails for a higher price than standard albacore cans, the trade data for whole, frozen albacore do not suggest any export price premium. Certification did perhaps both increase the product value and open new export destinations in one way that is not apparent from the information in the table: by allowing Fiji to sell a small amount of its albacore in the higher-priced tuna fillet market rather than into the canning supply chain (which processes whole fish). After exporting almost no tuna fillets prior to certification, Fiji exported \$1.4 million in tuna fillets to the Netherlands in 2013, and has exported between \$850,000 and \$2 million each year since. The 2013 shipments to the Netherlands attracted notice in industry press, since they represented a rare opportunity for the Fijian fishery to market its product in fillet form. Press reports specifically tied the shipments to interest in the European market for MSC-certified tuna.⁶⁶ However, exports of fillets cannot be included in the trade data analysis because, unlike the whole, frozen albacore that is shipped to canneries, albacore fillets are not differentiated from other tuna fillets in the trade data. So while industry press certainly suggests that the fillets being shipped were MSC-certified albacore fillets, the trade data do not allow us to examine only the certified product with certainty.

Alaska pollock

As noted earlier, the Alaska pollock fishery is the largest in the MSC program, and participants in the industry have stated that they believe that certification was one factor in helping them gain and retain access to European markets, particularly in the UK. One might expect, then, that the EU in general and UK in particular would make up a larger share of exports after certification. The trade data, however, do not directly reveal such a pattern. In fact, exports to the EU made up 93 percent of U.S. frozen block Alaska pollock fillets (the most commonly exported product form) in the 3 years before certification, and declined to 82 percent in the 5 years after. Similarly, exports to the UK made up 1.9 percent of exports in the 3 years before certification and 0.7 percent in the 5 years after.

One reason that the trade data did not give any support for the market access effect that the fishery claimed as a benefit of certification is that the product forms for Alaska pollock commonly consumed in the UK are breaded or battered fillets, fish sticks, or similar products. These products are often manufactured in third-country markets before being shipped to consuming markets. A review of product

⁶⁴ Prior to certification, American Samoa was by far the leading destination for Fijian albacore. StarKist and other tuna packers have operations in American Samoa, but Bumble Bee does not. As a U.S. territory, American Samoa is considered part of the United States' tuna industry and therefore exports to it are included with exports to the United States in trade data; as a result, a decline in exports to American Samoa is considered a decline in exports to developed countries.

⁶⁵ Lal, "Hopes for Better Albacore Price with Certification," January 17, 2013.

⁶⁶ SeafoodSource, "First MSC Tuna from Fiji On Sale in Europe," May 6, 2013.

descriptions on the websites of major UK retailers Tesco and Sainsbury's revealed that while some Alaska pollock products were manufactured in the UK, many were manufactured in Poland or China.⁶⁷ Indeed, U.S. exports of frozen block fillets to Poland and China did rise quickly in the years after certification. This suggests that more of the Alaska pollock may be processed into value-added forms in third countries before entering the UK market.

A related measure of effects in the breaded fish market is whether less Alaska pollock is being processed into surimi after certification. Surimi is a processed Alaska pollock product widely consumed in various forms in Japan and heavily exported from Alaska to Japan, as an alternative to selling the fish as fillets.⁶⁸ If more of the fish was being demanded by breading and battering processors to serve the European fillet market, less should be available for surimi, relative to total catch. Industry publications confirm that Alaska pollock producers prefer to export the fish to the fillet market when possible, as it is a more cost-effective production process than surimi.⁶⁹ Indeed, the overall trend since about 2000 has been towards increased fillet production relative to total Alaska pollock catch, and less surimi production.⁷⁰ The fact that the trend began in 2000, when certification was not achieved until 2005, suggests that certification is only one factor influencing producers to send more exports to the fillet market. The data suggest that this trend continued after certification, however—exports of fillets increased about 6 percent in quantity terms in the 5 years after certification as compared to the 3 years prior, while surimi exports fell 31 percent over the same period.⁷¹ It is difficult to determine exactly how much certification may have contributed to this longer-term trend, but the data are consistent with the hypothesis that more Alaska pollock is being processed into value-added fillets (sometimes in third countries) than prior to certification.

As noted in table 3, analysis of export unit values is not possible for Alaska pollock because there are only two major producers in the world: the United States and Russia. However, price information available from an industry source associated with the U.S. fishery suggest that the more recent certification of the Russian fishery has resulted slightly higher prices for Russian pollock and significantly lower prices for U.S. pollock. The U.S. fishery was certified in 2005, and the Russian fishery in 2013. According to the MSC, the Russian fishery sought certification because it was losing market share to the U.S. product in Germany, where certification is particularly important.⁷² Between 2005 and 2013, wholesale prices for U.S.-origin Alaska pollock were generally steady at about \$3,000 per mt.⁷³ After 2013, when competing pollock from Russia began to also carry MSC certification, such prices fell to below \$2,500/mt. Russia appears to have experienced only a small, temporary price bump after certification, but the increased ability to compete directly with MSC-certified, U.S.-origin pollock

⁶⁷ Tesco website, <https://www.tesco.com/> (accessed August 9, 2016); Sainsbury's website, <https://www.sainsburys.co.uk/> (accessed August 9, 2016).

⁶⁸ To Americans, the most familiar use for surimi is in "imitation crabmeat."

⁶⁹ IntraFish, "Alaska Pollock Producers Keep Focus on Fillets," August 3, 2004.

⁷⁰ Knapp, "An Overview of Alaska Pollock Markets," January 2006.

⁷¹ IHS Markit, GTA database (accessed November 30, 2016).

⁷² MSC, "Sustainable Seafood: The First 20 Years," April 25, 2017.

⁷³ Aside from a one-year price spike to around \$4000/mt in 2008.

reduced the price spread between the two, from an average difference of over \$2,000/mt before the Russian fishery was certified to just over \$1,500/mt after. The large price spread that still remains suggests that there are other differences between the U.S.- and Russian-origin product that limit competition between them, but MSC certification has clearly been an important component of the Russian fishery's ability to compete with the United States. The data also suggest that some of the price effects from certification may be felt not primarily as a price increase by the newly certified exporter, but potentially as a price decline by other certified exporters.

Conclusions for MSC certified seafood

Demand for MSC-certified seafood clearly affects trade, especially insofar as it influences global seafood processors to adapt their supply chains to incorporate more certified products. Processors tend to do this, however, while still being concerned with processing the fish in the most efficient locations (often third countries, such as Poland and China for Alaska pollock and Thailand for Fiji albacore). Because these supply chains have intermediate steps and other competitive conditions (such as Chile's entry into the Japanese salmon market) play a role in determining export destinations and prices, using trade data to determine the effects of demand for certified products on exports produces mixed effects. In some cases, such as for Alaskan salmon exports to the EU, such data are useful in identifying that the expected effects from certification have materialized. In others, the expected effects are not readily apparent in the trade data and further analysis is required. In general, if the analysis of the trade data is informed by knowledge of fisheries production patterns and alert to potential third-country effects or shifts in the product form after certification, such data can be a useful indicator of market access effects. It is less clear that export AUVs are a useful indicator of price effects from certification. Additional research into the fisheries that experienced better export AUVs post-certification than competitors, particularly the South American shellfish fisheries, would be a helpful test case for whether export AUVs can reasonably be used as a proxy for export price effects from certification (and under what circumstances).

Case study: RSPO-certified Palm Oil

Global palm oil market overview

Since the beginning of the millennium, global demand for palm oil has been increasing. Between 2000 and 2015, global palm oil consumption increased 7 percent annually and, in response, production has risen over 6 percent annually (see box "How is palm oil produced and used?").⁷⁴ Around 2005, palm oil overtook soybean oil as the most widely consumed edible oil in the world and now accounts for about 34 percent of all edible oil consumption. Globally, demand for palm oil has risen for a variety of reasons

⁷⁴ Unless otherwise noted, data in this section are based on quantity for MY 1999/2000 to 2015/16 from USDA, PSD Online (accessed December 2, 2016).

including its low price compared to other major vegetable oils; changing diets in developing countries related to rising incomes; and its expanding non-food use, including in cosmetics and as a bio-diesel.⁷⁵

Only a few countries produce palm oil but demand is widespread, making many consumers highly dependent on imports. Together, Indonesia and Malaysia accounted for about 85 percent of global production and 91 percent of exports during marketing years (MY) 2013/14–15/16. Although the Southeast Asia region consumes the largest share globally, it accounted for only 27 percent of global consumption in that period. The other major consuming regions rely on imports, particularly South Asia (23 percent of consumption), East Asia, and the EU-28 (11 percent each).

Increased production of palm oil has led to the expansion of plantations in Indonesia and, to a lesser extent, Malaysia. However, the dense smog that engulfs Southeast Asia annually as slash and burn techniques are used to clear forestland for new oil palm trees is a reminder of the environmental problems associated with expanding palm oil production. These include deforestation, destruction of peat lands, and the related loss of habitat for orangutans and other animals. Concerns about this environmental damage and its potential impact on future supply of palm oil gave rise to the establishment of certifications for sustainably produced palm oil and its derivatives.

How is palm oil produced and used?

Palm oil production is a multi-stage process. It begins with oil palm trees, which are cultivated for their bunches of fruit. The majority of oil palms are grown on plantations and new plantings often entail the clearing of forestland. When ripe, bunches of fresh palm fruit are harvested and, within 24 hours, milled into crude palm oil. Next, at refineries, crude oil is processed into refined palm oil. After refining, palm oil will eventually go through one or more different production processes (often at different plants) to be turned into a palm oil derivative, which are specific to different food or industrial applications. The majority of palm oil is destined for food uses; however, industrial uses account for over one-quarter of consumption.

Sources: USDA, PSD Online (accessed October 16, 2017).

The Role of RSPO Certification in the Market

The RSPO is the principal voluntary certifying body for palm oil.⁷⁶ Palm oil certified by RSPO is called CSPO. It was officially established in 2004, driven largely by efforts of the WWF and Unilever, which each have different motivations for promoting the use of sustainable palm oil.⁷⁷ WWF's primary goal is environmental protection, while Unilever's is to ensure long-term supply of an important ingredient. The RSPO initially involved only European stakeholders, including manufacturers, retailers, and NGOs, whose

⁷⁵ Brandi et al., *Sustainability Certification*, 2013, 15; IMF, Primary Commodity Prices for Palm Oil, (accessed July 28, 2016); PRWeb.com, "Rising Demand for Sustainable Palm Oil," March 10, 2015; GIA, *The Global Palm Oil Market*, February 2015.

⁷⁶ The Rainforest Alliance/SAN began covering palm oil production in 2013 and covers a small amount of production mostly in Latin America. The Palm Oil Innovation Group (POIG) which offers a "POIG Charter" to recognize RSPO certified producers who meet more stringent criteria than the RSPO certification criteria. Both the Malaysian and Indonesian governments established mandatory national certification standards: Indonesian Sustainable Palm Oil (ISPO) and Malaysian Sustainable Palm Oil (MSPO) which do not appear to be widely accepted by the key stakeholders in developed countries. Industry expert, phone interview (August 24, 2016); RA, "Rainforest Alliance Certified Palm Oil," June 6, 2016; Poig.org; MSPO.org; IPSO.org.

⁷⁷ Schouten and Glasbergen, "Creating Legitimacy," March 2011; Potts et. all, *SSI Review*, 2014.

priorities were to limit deforestation and maintain bio-diversity. However, stakeholders from other countries—including Malaysian and Indonesian producers and associations—have joined the RSPO, hoping to improve market links and influence certification standards.⁷⁸

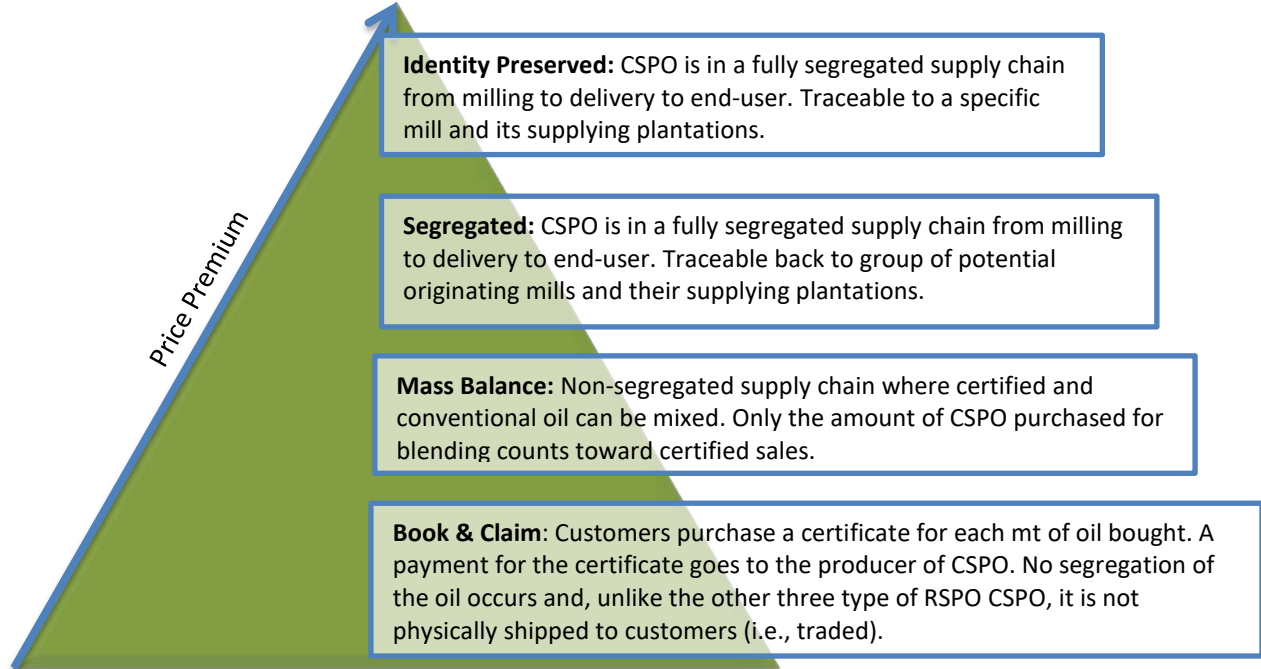
There are four methods for purchasing CSPO which vary in level of traceability and segregation of certified and conventional oil (figure 2). Book and Claim, where no segregation of the oil occurs, is the only method that does not result in physical trade of CSPO between the producer and the purchaser. Instead, under Book and Claim, certificates for CSPO (known as “RSPO certificates” in this paper) that act as offsets like those available for carbon emissions are traded.⁷⁹ The primary physically traded types of CSPO are Mass Balance and Segregated. Segregating CSPO from conventional palm oil increases production costs because of the need to separate and track CSPO. Identity Preserved is the most expensive form of CSPO because of the costs related to having a fully segregated product, traceable to a specific plantation. Reportedly, because of its high costs, use of Identity Preserved CSPO is limited to specialty products and, by one estimate, accounted for less than 1 percent of all CSPO purchases as of 2016.⁸⁰ Trade in CSPO through the three most commonly purchased methods—Book and Claim, Mass Balance, and Segregated—is the focus of this case study although this multifaceted system for purchasing CSPO adds additional complexity to analyzing the effects of certification.

⁷⁸ Currently, RSPO’s criteria for receiving certification are governed by a set of 8 principles, 3 of which are focused directly on the environment: (1) use of best sustainable practices by growers; (2) responsible development of new plantings; and (3) environmental responsibility and conservation of natural resources and biodiversity. RSPO, “Principles and Criteria for the Production of Sustainable Palm Oil,” April 2013.

⁷⁹ Until early 2017 these certificates were traded on a platform run by Green Palm Sustainability (as “Green Palm certificates”); they are now traded on the PalmTrace platform run by UTZ (as “RSPO certificates,” the term used in this paper regardless of the actual trading platform). RSPO.org, “Everything you need to know about RSPO Credits,” October 3, 2016; RSPO, PalmTrace, <https://rspo.org/palmtrace> (accessed June 7, 2017).

⁸⁰ GreenPalm.org, What is Green Palm?, (accessed July 14, 2016); Industry expert, phone interview, August 17, 2016.

Figure 2 Methods for Purchasing RSPO CSPO



Source: Green Palm website, <http://greenpalm.org/about-greenpalm/what-is-green-palm> (accessed August 10, 2016); Industry expert, phone interview by Commission staff, August 17, 2016.

The Market for CSPO

There are a number of ways RSPO certification can theoretically affect international trade patterns for palm oil. It may affect exporters' market access, importers' supplier mix, or export and import prices.⁸¹ This case study presents the results of our examination of the available relevant data to determine what effects RSPO certification has had on trade flows and prices for CSPO, especially for physically traded CSPO (Mass Balance and Segregated).

This analysis was complicated by the fact that while data exist for global trade flows of palm oil, this palm oil is not identified in the data as certified or not. Another way to get at trade flows is by examining the supply and demand for CSPO by country, which is a major determinant of the trade in certified

⁸¹ Another way that demand for certified products could affect palm oil trade would be by causing changes in the product mix of edible oils consumed in a country and subsequent imports. Edible oils are substitutable for many applications and if one type is seen by consumers as having a desirable trait—such as being certified sustainable—it could cause demand for that type of edible oil to increase. If that edible oil were only (or mostly) available through imports—as is the case with CSPO—it could also cause a change in the edible oils a country imports. However, such a change would be difficult to observe because the data available to determine if CSPO affected product mix are limited, in large part because data for individual EU member states are not available. Moreover, in addition to concerns about sustainability, many factors influence the purchasing decisions for substitutable edible oils—especially palm oil, soy oil, and rapeseed oil—including price, availability, and differing actual or perceived health benefits.

product. These data are not directly available, but here we attempt to derive this information. Therefore we first estimate the total CSPO supply by country by estimation using existing data on area planted in producing countries. We also estimate demand, overall and by CSPO type, using data from RSPO and U.S. Department of Agriculture. It is not possible to quantify CSPO demand by country, but we use information from RSPO and the WWF to determine the markets where demand for CSPO is concentrated and important for access to the market. We also use this information, coupled with trade data, to examine whether there was a link between an importer’s supplier mix and the appearance of CSPO in the market. Finally, we examine the price effects—what price premiums exist for CSPO by type and whether premiums can be found for physically traded CSPO in trade prices—using Green Palm data, trade data, and pricing data. This analysis covers 2008 through 2015.

Two factors further complicate this analysis. First, RSPO certified production significantly exceeds demand and, as outlined above, a large portion of demand for CSPO was fulfilled by purchase of RSPO certificates rather than physically traded CSPO.

Identifying CSPO Supply

Production of CSPO has grown rapidly since it first became available in November 2008, and roughly one-fifth of global production was certified as of 2015 (table 4). While certified sustainable production continued to expand through 2015, it did so at a decreasing rate. In the first three full years of RSPO certification, CSPO production increased about 94 percent annually: between 2013 and 2015 it grew about 15 percent annually. Some of the world’s largest palm oil producers including the Malaysian-headquartered Sime Darby and Kuala Lumpur Kepong Berhad (KLK) as well as Wilmar Int. Ltd., a leading Asia agribusiness, began achieving certification early and had large portions of their production certified by 2012/2013.⁸² It is easier for larger companies to bear the cost of certification—which include initial certifying audits and annual assessments to ensure compliance with RSPO criteria—than for smaller producers.⁸³

Table 4: Palm oil and RSPO CSPO: Global Supply 2008–15

	2008	2009	2010	2011	2012	2013	2014	2015
	Production (1,000 mt)							
Palm Oil	41,427	44,464	46,374	49,192	52,529	56,377	59,274	61,633
CSPO	619	1,474	3,522	5,573	8,184	9,792	11,909	12,886
	Share of Production							
CSPO	1%	3%	8%	11%	16%	17%	20%	21%

Sources: RSPO, Impacts, updated October 31, 2016; USDA, PSD Online (accessed December 2, 2016).

Note: Total production data are based on market year (e.g. 2008 = MY 2007/08).

As with conventional palm oil, CSPO production is concentrated in Indonesia and Malaysia, but over half a dozen other countries contribute to global supplies (table 5). To estimate country-specific CSPO production, we assume that all bunches of fresh palm fruit grown under certified conditions are milled

⁸² See e.g., RSPO, RSPO Progress Reports, 2012/2013; Wilmar, *Sustainability Report 2015*, 24.

⁸³ RSPO.org, “How RSPO certification works” <https://rspo.org/certification/how-rspo-certification-works> (accessed April 20, 2018).

into certified palm oil in their country of origin.⁸⁴ Where possible, we calculate yields based on a three-year average to smooth out any annual fluctuations.⁸⁵ Overall, South East Asia's estimated share of global CSPO production is about 2 percent more than its share of conventional palm oil production, largely reflecting Malaysia's higher yields.

Table 5: Estimated 2015 RSPO CSPO production by country

Region/country	RSPO certified planted area 1000 ha	Share of total planted area		Estimated RSPO CSPO production 1000 mt	Share of global CSPO production %	Estimated 2015 CSPO production 1000 mt
		RSPO certified %	Yield mt/ha			
South East Asia		88.6%			90.9%	
Indonesia	1,580	55.4%	3.73	5,893	55.4%	7,132
Malaysia	755	26.5%	4.13	3,118	29.3%	3,774
Papua New Guinea	148	5.2%	3.63	537	5.0%	650
Thailand	18	0.6%	2.93	53	0.5%	64
Cambodia	25	0.9%	3.03	76	0.7%	92
South and Central America		9.2%			7.9%	
Brazil	129	4.5%	2.79	360	3.4%	436
Colombia	40	1.4%	3.19	128	1.2%	154
Ecuador	4	0.1%	2.35	9	0.1%	11
Honduras	21	0.7%	3.64	76	0.7%	93
Guatemala	21	0.7%	4.29	90	0.8%	109
Costa Rica	48	1.7%	3.62	174	1.6%	210
Africa		1.1%			0.4%	
Cote d'Ivoire	9	0.3%	1.54	14	0.1%	17
Ghana	21	0.7%	1.30	27	0.3%	33
Madagascar	2	0.1%	1.42	3	0.0%	3
All Other	38	1.3%	2.34	89	0.8%	108
Total ^a	2,850	100%	2.34	10,647	100%	12,886

Sources: Authors' estimates based on RSPO.org, Impacts (accessed August 24, 2016); USDA, PSD Online (accessed December 2, 2016).

^a Total may not sum due to rounding.

Identifying CSPO Demand

Demand for CSPO, for which sales serves as the best proxy, has grown but lags significantly behind production (table 6). Unlike production, total certified consumption is not systematically tracked, so we use RSPO's sales data for CSPO as a proxy for demand. Sales of CSPO initially grew rapidly and have continued to grow, although at a continually declining rate: sales grew 17 percent annually on average during 2013–15. On average, 45 percent of CSPO produced was sold as certified (rather than as conventional palm oil) during 2011–15, and by 2015, CSPO reached about 11 percent of global palm oil

⁸⁴ Therefore, we multiply RSPO's data on certified production area by an average oil yield in mt per hectare (ha).

⁸⁵ Where these data were not available, a simple regional or global average was used.

consumption.⁸⁶ Data do not exist to estimate country-specific CSPO consumption or physical CSPO imports.⁸⁷

Table 6: Palm oil and RSPO CSPO: Global Demand, 2008–15 (1,000 mt)

Demand	2008	2009	2010	2011	2012	2013	2014	2015
Palm Oil consumption	39,853	42,794	44,782	47,538	50,379	55,421	58,050	58,391
CSPO Sales	0	344	1,281	2,491	3,479	4,513	5,350	6,183
Physical: Segregated & Mass Balance	0	98	439	831	984	1,551	2,432	2,756
RSPO Certificates: Book and Claim	0	246	843	1,660	2,495	2,962	2,917	3,427

Source: RSPO, Impacts, accessed October 31, 2016; USDA, PSD Online (accessed December 2, 2016).

For purposes of this analysis, demand for CSPO is subdivided into demand for RSPO certificates under the Book and Claim system or for physical product (either Segregated or Mass Balance). This is important because only demand for physical CSPO appear in international trade in certified palm oil: with sales of RSPO certificates there is no trade to examine. During 2008–15, the majority of CSPO consumers purchased RSPO certificates, but physical sales grew. Initially, buyers heavily favored RSPO certificates, which accounted for 68 percent of sales during 2009–13. This meant that most RSPO purchases did not result in a shipment of certified oil between the seller and the buyer that would be observable in international trade. However, demand for physical CSPO has grown and it accounted for 45 percent of CSPO sales during 2014–15, up from an average of 32 percent during 2009–13. This occurred in part because a number of companies (primarily based in Western Europe) are shifting from the purchase of RSPO certificates to physical purchases of CSPO for their supply chains.⁸⁸

Examining the Effects of RSPO Certification

Market Access

Since palm oil is a highly traded product, the ability to access export markets is very important for producers. For Indonesia and Malaysia, palm oil (HS 1511) is an important source of revenue as the largest agricultural export; for most of the past decade, it was also among the top 4 exports of both countries.⁸⁹ Approximately 120 countries import palm oil annually, although the top three markets—India, the EU-28, and China—normally account for over half of all imports. Production of CSPO is increasingly important for accessing markets in Western Europe and the United States, as well as the global supply chains of many businesses headquartered in those countries, but not for accessing most other markets. The two most recent WWF Scorecards, which survey companies (mostly in developed countries) about their use of CSPO, show that between 2013 and 2015 there was an overall upward

⁸⁶ Calculated using data from RSPO, Impacts, accessed October 31, 2016

⁸⁷ It is possible that data will improve in this area in the future, especially for the EU, if it makes sustainability certification mandatory for palm oil imports.

⁸⁸ WWF Palm Oil Buyers Scorecard 2016 database <http://palmoilscorecard.panda.org/methodology>; Unilever, *Sustainable Palm Oil Progress*, 2014; Nestlé, *2015 Nestlé in Society*, 2015.

⁸⁹ Trade data in this section are by value for HS 1511. IHS, GTA database (accessed July 13, 2017).

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trend in CSPO use as a share of total palm oil reported by companies: from 49 percent in 2013 to 76 percent in 2015 (table 7).⁹⁰

Table 7: Commitments and Progress on CSPO Use, by country, 2013 and 2015

Country	Country Commitments		Company Progress: WWF Buyer Scorecard			
	Presence of an alliance	Goal: 100% CSPO use	# Companies reporting	% usage	# Companies reporting	% usage
		year	2013		2015	
Austria	✓	2014	N/A	N/A	N/A	N/A
Australia			6	49%	6	86%
Belgium	✓	2015	4	42%	5	79%
Canada			^a	^a	1	100%
Denmark	✓	2016	3	72%	2	100%
Finland			4	87%	4	70%
France	✓	2015	14	78%	11	92%
Germany	✓	2014	9	45%	^a	^a
India			2	0%	2	0%
Italy	✓	2020	2	61%	3	53%
Japan			9	19%	9	17%
Netherlands	✓	2015	10	93%	9	99%
Norway	✓	2015	1	100%	^a	^a
Sweden	✓	2015	6	100%	5	100%
Switzerland	✓	2014	5	89%	6	25%
United Kingdom	✓	2015	15	53%	16	99%
USA			14	32%	19	83%
Total	11		104	49%	98	76%

Source: RSPO, National Commitments <https://rspo.org/certification/national-commitments> (accessed July 12, 2017); WWF, *Palm Oils Buyers Scorecards*, 2013 and 2016.

^a Not surveyed in reporting year.

The ability to supply CSPO has become critical for accessing the Western European market. Companies based in Western Europe are major drivers of the demand for CSPO. The WWF Scorecards show that in 2013 and 2015, about 80 percent of palm oil used by reporting European companies was certified. The commitments of many firms— including those of Unilever, Nestlé, and Ferrero— apply to their entire global supply chains. In 11 European countries, organizations called alliances, whose members make voluntary commitments to purchase 100 percent CSPO, have been formed. The majority of members in

⁹⁰ While many companies were surveyed for both Scorecards, the group of companies did change between the two surveys. The two most recent reports, covering 2013 and 2015, surveyed companies in 15 countries: each had responses from close to 100 companies whose CSPO use accounted for about three-quarters of CSPO sales for the year. In total the companies surveyed in 2015 accounted for about 10 percent of global palm oil use. Nearly every reporting company has committed to using 100 percent CSPO. As a result the survey generally reflects the progress by committed companies but does not necessarily reflect the country's overall level of commitment.

Exporting Ecolabels

these alliances are companies who buy palm oil.⁹¹ In some alliances, these corporate members are highly concentrated in the food industry, but in others they include industrial sectors. Initially, these alliances established commitments to purchases of CSPO in any form, and most companies fulfilled their pledges by purchasing RSPO certificates through the Book and Claim system. However, alliances covering at least seven countries have now additional goals for moving to physical purchases, especially of segregated CPSO.⁹² In some countries, including the United Kingdom and the Netherlands, these alliances enjoy strong support from government, which encourages companies to source CSPO over conventional palm oil. In countries like these, CSPO is becoming the de facto standard for market access, although no country currently mandates that imports of palm oil be sustainably certified. However, certification may soon become mandatory to access the EU market: in April 2017 the European Parliament passed a resolution calling for the EU to establish a minimum sustainability standard for CSPO imports.⁹³

Companies in the United States—the 5th largest market for palm oil—are also increasingly buying CSPO. Reportedly, 63 percent of U.S. purchases of palm oil were CSPO in 2014, nearly double the amount in 2013, however, most of this was through the Book and Claim system and did not result in identifiable physical trade.⁹⁴ The 2013 and 2016 WWF Scorecards indicate the growing importance of CSPO in the U.S. market and in the supply chains of U.S. companies: about 83 percent of palm oil used by reporting U.S. companies was certified in 2015.⁹⁵ As is the case in Europe, many large U.S. firms' commitments are for their entire global supply chains including those of Pepsi Co., McDonald's, Colgate-Palmolive, and ConAgra.

Outside of Western Europe and the United States, there are only a limited number of countries where the ability to supply CSPO may impact market access. Foremost among these is Australia, where about 86 percent of palm oil used by reporting Australian companies was certified in 2015 and a number of companies are RSPO members (32 as of mid-2017). There has been limited CSPO sourcing from firms in developed Asian countries, and Japan is the clear regional leader. However, the WWF Buyer Scorecards show the progress of Japanese companies in shifting to CSPO is slow, especially compared with those in Western Europe. Japan's usage rates were the lowest reported and fell in 2015, reflecting the postponement of the deadlines to transition to 100 percent CSPO use (to 2018 or 2020) by most Japanese companies reporting in both years.⁹⁶ Finally, there is some anecdotal evidence that the ability to supply CSPO could affect market access into Canada, New Zealand, and Singapore, but there is little to no data on CSPO use levels in those countries.⁹⁷

⁹¹ EPOA, Impact Report 2015 Infographic, n.d; FORUM, Members, <https://www.forumpalmoel.org/our-members> (accessed October 3, 2016).

⁹² Most alliances set targets for reaching goals between 2018 and 2020. RSPO, National Commitments, <https://rspo.org/certification/national-commitments> (accessed July 12, 2017).

⁹³ European Parliament resolution 2016/2222(INI) April 4, 2017.

⁹⁴ Thomas et al., *Sustainable Sourcing Guide of Palm Oil Users*, May 2015.

⁹⁵ A group of firms accounting for over 93 percent of reported US palm oil use were included in both years.

⁹⁶ Switzerland's usage also fell because Nestlé switched from Book and Claim to its own sustainability criteria.

⁹⁷ See e.g., RSPO Members <http://www.rspo.org/members/all>; Singapore Alliance on Sustainable Palm Oil.

Supplier Mix

To determine any effects RSPO certification has had on trade flows, we examine the mix of suppliers of palm oil for the countries listed in table 7, excluding two: India, whose commitment to purchasing CSPO is minimal, and Canada, because of limited data on CSPO usage coupled with the lack of an alliance committed to CSPO use. A complicating factor in this analysis is that, unlike for MSC fisheries, the trade of physical CSPO has been phasing in slowly, so there is no clean before and after comparison period. We do not expect that the choice to import certified product would necessarily suggest a change in supplier mix because most palm oil producing countries export both certified and uncertified oil. However, it is possible that countries could make some sourcing changes when purchasing CSPO.

To determine if any of the 15 countries in our group changed suppliers once CSPO became available, we examine import data of both crude (HS 1511.10) and refined (HS 1511.90) palm oil and their fractions for 2000–15. For each HS category, a country is eliminated from this analysis if, during 2006–15, (1) its imports were minimal, which is defined as less than 3 percent on average of total imports under HS 1511, or (2) it had high levels of transshipments, which is defined as imports of 30 percent or more from non-producing countries. Additionally, the Netherlands and Germany are excluded from this analysis because both countries serve as entry points for Europe, inflating their import quantities and distorting the ability to examine changes in imports for domestic consumption.

After these exclusions, five countries—Denmark, France, Italy, Switzerland, and the United Kingdom—meet the criteria to be examined for crude oil, and four—Australia, Italy, Japan, and the United States—for refined. We examine these markets for a notable change in supplier mix: defined as a year-on-year-increase of 20 percentage points or more in favor of imports from a given supplier. It is easier to establish where CSPO had no discernible impact on trade flows, which was the case for four of these countries, than it was to determine where it did (table 8). For most of the remaining trade flows, notable shifts in trade occur after 2009 when corporate buyers in these countries began to transition towards use of CSPO amidst pressure by NGOs. However, competing factors make it hard to draw a firm conclusion on whether purchasing CSPO affected the choice of supplier.

Table 8: Evidence of changes in supplier mix

Product/ Importer	Evidence of a notable change in supplier mix?
1511.10 (Crude)	
Denmark	Yes
France	No
Italy	Yes
Switzerland	No
United Kingdom	Yes
1511.90 (Refined)	
Australia	No
Italy	Yes
Japan	No
United States	Yes

Source: Authors' analysis based on trade data from IHS Markit, GTA database, (accessed July 28–29, 2016).

Only for the United Kingdom can the change in imports of crude palm oil can be directly linked to increased imports of CPSO (table 9). Papua New Guinea (PNG) has long been an important supplier to the United Kingdom, but after CSPO became available, it became the majority supplier. UK imports from PNG fluctuated but averaged 27 percent annually between 2000 and 2010. After 2010, PNG’s share of UK imports rose sharply and by 2014–15 averaged 64 percent. In 2010, a new refinery for CSPO was opened in Liverpool by a PNG-based producer, New Britain Palm Oil Ltd., which states it is the world’s largest producer of CSPO.⁹⁸ Moreover, the United Kingdom is unique because information is available on the amount of CSPO physically imported (i.e., Mass balance and Segregated CSPO). In 2012, physical CSPO imports were roughly one-third of total UK palm oil imports and by 2015, they accounted for the vast majority (see Price Effects below).⁹⁹ These data demonstrate that the United Kingdom’s imports of physical CSPO imports were increasing as PNG became its largest supplier. This shift can be linked not just to the general appearance of certified palm oil on the market, but to the decision by one producer of CSPO—New Britain Palm Oil Ltd.— to modify its internal supply chain in order to refine its crude CSPO closer to the demand base for certified product in the United Kingdom.

Table 9: United Kingdom Imports of Crude Palm Oil (HS 1511.10), by supplier, 2006–15

Supplier	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
<i>million USD</i>										
World	235.0	224.5	336.0	220.2	241.7	346.5	345.6	268.2	244.0	199.2
<i>share (percent)</i>										
PNG	17%	23%	27%	31%	27%	44%	44%	56%	65%	63%
Indonesia	42%	22%	14%	23%	26%	21%	4%	5%	12%	14%
Solomon Isl.	0%	3%	0%	0%	1%	1%	7%	1%	10%	9%
Malaysia	17%	16%	15%	13%	26%	20%	15%	12%	4%	5%
Colombia	16%	24%	19%	8%	4%	3%	0%	2%	0%	0%

Source: Compiled based on IHS Markit, GTA database, (accessed July 28–29, 2016).

Price Effects

Price premiums

CSPO sales are driven by business-to-business transactions. Many European and American companies have committed to purchasing CSPO as part of their corporate social responsibility strategies. Such conditions seem likely to create a scenario that would lead to a corporate buyer paying a price premium that may be reflected in the trade price. CSPO purchased through different RSPO purchasing methods have different price premiums, as set by market forces.¹⁰⁰

⁹⁸ New Britain Oils, Supply Chain Video <http://www.newbritainoils.com/> (accessed October 1, 2016). New Britain Palm Oil Ltd. was a subsidiary of Johor Corp until 2015 when it was sold to Sime Darby Bhd.

⁹⁹ Data are for total CSPO imports, not crude. Defra/CPET, *UK Consumption of Sustainable Palm Oil*, 2013, 2017.

¹⁰⁰ All palm oil derivations are priced differently and should generate different premiums. However, premiums should positively correlate with the amount of processing because of the higher expense related to segregating certified derivations at each stage of production. Industry expert, phone interview, August 17, 2016.

Data on the premium paid to the seller are available for Book and Claim, because RSPO certificates are publicly traded. These price premiums began declining almost immediately and fell until 2016 when they grew slightly on the expectation of tighter supplies (table 10). Overall, Book and Claim premiums were one-half of one percent or less of the average palm oil price during 2011–16.¹⁰¹ Low premiums are the natural result of supply exceeding demand by an almost two-to-one ratio.

Table 10: Book and Claim: Average Premiums of RSPO Certificates (USD per mt), 2008–16

2008	2009	2010	2011	2012	2013	2014	2015	2016
44.68	9.05	7.82	5.33	3.89	2.76	1.85	1.15	2.32

Source: GreenPalm.org, Annual Certified Sales and Annual Certificate Premiums (RSPO Certified Growers), (accessed December 5, 2016; June 6, 2017).

There is limited information on price premiums for the other RSPO purchasing methods, which are all business-to-business transactions. However, anecdotal evidence indicates that they are much higher than under Book and Claim.¹⁰² One industry expert estimated premiums for Mass Balance CSPO were around \$15/mt as of mid-2016 which would have represented about 2 percent of palm oil prices on average during 2013–15.¹⁰³ They estimated premiums for Segregated CSPO were about \$25–\$35/mt, which would have represented 4-5 percent of the average price. Other industry experts from WWF and Conservation International utilized an estimated premium of \$50/mt for segregated CSPO in a hypothetical cost scenario in May 2015, but stated that the cost would be vary higher or lower based on the specific CSPO derivation.¹⁰⁴ This would have been equal to about 7 percent of the price of palm oil during 2013–15.

Trade price premiums

In order to determine whether CSPO has generated a premium in the trade price we need reliable data on the share of physical CSPO is imported by a country annually, to establish both whether CSPO imports were substantial enough to warrant testing for a price premium and to define the comparison period to test. However, in general this information is not available. It is not possible to segregate physical CSPO imports from conventional imports based information in the tariff schedule and for most countries these data are not available from others sources.

For only one country—the United Kingdom—was there are sufficiently detailed data on physical CSPO imports to examine the effects of certification of palm oil on import prices. In addition to an alliance committed to sourcing 100 percent sustainable CSPO by 2015, the UK government has an active leadership role in trying to achieve this goal. It has involved a wide swath of palm oil users, including

¹⁰¹ Average palm oil prices in this section are based on IMF’s Primary Commodity Prices and World Bank’s GEM database (both accessed July 27-28, 2016; June, 6, 2017).

¹⁰² Identity Preserved CSPO is the most expensive form of CSPO because of the costs related to having a fully segregated supply chain traceable to specific plantations. As a result, its use is limited to specialty products and, by one estimate, it accounts for less than 1 percent of all CSPO purchases. GreenPlam.org, What is Green Palm? (accessed July 14, 2016); Industry expert, phone interview, August 17, 2016.

¹⁰³ Industry expert, phone interview, August 17, 2016.

¹⁰⁴ Thomas et al., *Sustainable Sourcing Guide of Palm Oil Users*, May 2015.

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producers of food, feed, and non-food items; and it commissions studies to track the country's CSPO use.¹⁰⁵ In 2012, physical CSPO sales in the UK were a substantial minority of palm oil imports: an estimated maximum of 41 percent. By 2014, they accounted for a majority of imports: an estimated maximum of 68 percent. In 2015, most, if not all, imports were certified sustainable: an estimated maximum of 108 percent.¹⁰⁶

The data show that, as imports of physical CSPO increased, UK import AUVs (average unit values—a proxy for import prices) rose above global prices through 2015, although they still followed global pricing trends (figure 3).¹⁰⁷ UK import AUVs for 2006–08—the three years before sales of physical CSPO could have existed—were relatively close to global prices. The UK's import AUVs for the world as well as the PNG,¹⁰⁸ were about 2 percent below the World Bank's Global Economic Monitor (GEM) prices. The lowest import AUVs, for Indonesia, were 7 percent below global prices. UK import AUVs were higher than IMF global prices, ranging from an average of 7 percent higher for imports from PNG and the world, to less than 3 percent higher for imports from Indonesia. During 2013–15, UK import AUVs were above GEM prices by 9 percent on average. They ranged from over 8 percent above for PNG, to 4 percent above for Malaysia. In that period, UK import AUVs were over 18 percent above IMF prices on average. They ranged from over 17 percent above for PNG, to 14 percent above for Malaysia. These data indicate that increased purchases of CSPO likely contributed to a rise in import prices for palm oil imported into the United Kingdom. However in 2016, when the vast majority of imports were certified sustainable, UK import AUVs and global prices appear to have converged again. Whether this is an aberrational year, the price premium has shrunk greatly or disappeared now that CSPO has become the norm, or transferred to a different point in the supply chain remains to be seen over time.

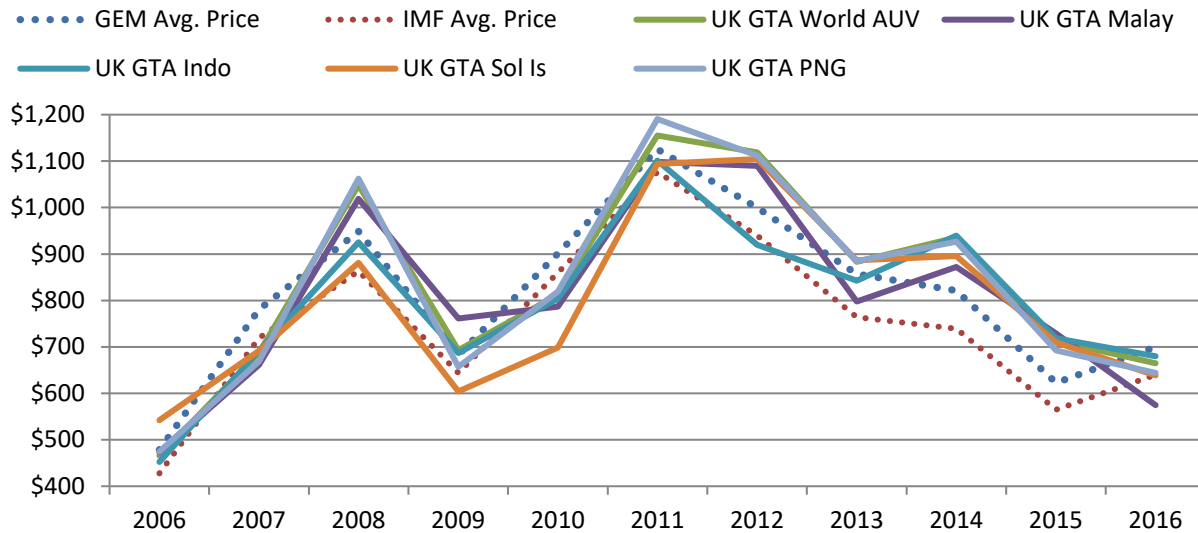
¹⁰⁵ Defra/CPET, *UK Consumption of Sustainable Palm Oil*, 2013, 2014, 2015, and 2017.

¹⁰⁶ Defra/CPET used two denominators— from FEDIOL and OIL World—to calculate the share of CSPO sales, the higher of which is presented above. It acknowledges shares exceeding 100 percent are problematic and may have occurred for a number reasons including problems with market intelligence.

¹⁰⁷ For traded prices, we use AUV prices from the GTA database for UK crude oil imports (HTS 1511.10) for its top four suppliers who are palm oil producers and, for an average, the world.

¹⁰⁸ The PNG AUVs likely reflect intercompany transfer prices between the New Britain Palm Oil Ltd. PNG-based crude oil mill and the UK-based refinery.

Figure 3 Palm oil: World Prices and select UK Trade Prices, 2006–16 (USD/mt)



Source: World Bank, GEM database (accessed July 27, 2016; June, 6, 2017); IHS Markit, GTA database (accessed September 7, 2016; June 6, 2016); IMF, Primary Commodity Prices (accessed July 28, 2016; June, 6, 2017).

Note: Malay = Malaysia; PNG = Papua New Guinea; Indo = Indonesia; Sol Is = Solomon Islands.

Conclusions for RSPO certified palm oil

As already established, there are many data challenges to quantitatively examining the possible effects of certification on international palm oil trade, more so than with MSC certified seafood. We can infer from where companies that demand CSPO are concentrated that the ability to produce CSPO is important for access certain markets, primarily in Western Europe and the United States. The lack of data on physical trade in CSPO hampered our ability to draw conclusions on the impact of RSPO certification on supplier mix and premiums in trade prices. However, for the one importing country—the United Kingdom—with detailed data on the amount of CSPO physically imported, we found that that certification did impact an importer’s supplier mix and appears to have created a price premium for imports, at least for a time. It is important to note that over half of UK imports are likely part of one company’s internal supply chain —New Britain Palm Oil Ltd. This could mean that the effects, particularly on product mix, may be unique to this situation. To draw broader conclusions of the effects of certification on international palm oil trade, detailed data on the amount of physical CPSO imported by countries, particularly in Western Europe, would be required, as well as knowing whether the trade occurring is part of inter-company transfers. Lacking similarly detailed data for any other trade flows, we cannot draw broad conclusions from the United Kingdom findings about the impact of certification on palm oil.

Overall Conclusions

This paper provides an initial examination of whether demand for certified sustainable products is having an effect on international trade. Through our case studies on seafood and palm oil, we conclude that there is evidence that certification may help producers grow and maintain their market share in developed countries (particularly in Europe). This is consistent with the claims made by many certification programs. For seafood, there was evidence of increased access to developed country markets after certification in 5 of 9 cases that we examined using the trade data. We observed the same effect for Papua New Guinea's access to the British palm oil market, although we emphasize that results from a single country pair driven by internal company decisions should not be generalized too broadly. In examining the data, we noted that effects generated by the MSC, which certifies products exported by a large number of countries and which has clear certification implementation dates, were generally easier to interpret than the RSPO, which works with a smaller number of producing countries and whose buyers have gradual phase-in periods.

The existence of price premiums at the point of international trade was more difficult to discern than the market access effects. Price premiums may or may not exist for any particular certified product, and they may be generated at any stage of the supply chain. Some of the premium may be generated after trade occurs (e.g., between importers and retailers, or retailers and consumers).¹⁰⁹ For seafood, we found evidence of possible price premiums in 3 of 7 cases using export unit values. For palm oil, we found that as the UK moved toward sourcing only physical CSPO, the price of palm oil it imported moved well above global averages, providing strong evidence for a price premium on physical CSPO for a few years.

In general, we found that it is difficult to obtain the data necessary to be able to draw firm conclusions about price premiums for certified products. To test trade prices for premiums, it is necessary to have a sufficient time period over which prices can be observed and "control" prices that were not affected by certification in order to determine how likely it is that price differences were due (at least in part) to certification. If offsets exist (like RSPO's Book and Claim system), it is also necessary to know the share of physical certified product used or imported by each country. It is helpful to look at countries where commitments to sustainable purchases exist so that those markets can be examined more closely. Finally, we note that the business-to-business nature of many transactions involving certified products is a stumbling block to obtaining data on prices. In many cases, the certification programs themselves have some of the transaction-level data that are needed to better interpret the economic effects of the programs, but these data often are not made public. If certification programs made more of this data available, it would permit more robust analysis of the role of certified products in global trade.

¹⁰⁹ We note that ingredient products like palm oil have added complexity because they can go through many stages of production before being used by a corporate customer, and each of these processes may occur in a different country.

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