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Who benefits from the rapidly increasing Voluntary Sustainability Standards? Evidence from Fairtrade and Organic certified coffee in Ethiopia

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ABSTRACT

Voluntary Sustainability Standards (VSS) are rapidly increasing in global value chains. While consumers, mostly in developed countries, are willing to pay significant premiums for such standards, it is not well understood how effectively these incentives are transmitted to producing countries. We study VSS in Ethiopia's coffee sector, the country's most important export commodity, using a unique census of transaction data at the export level and large-scale data at the production level. We find that transmission of the export quality premiums to coffee producers is limited, with only one-third of this premium being passed on. Moreover, as quality premiums are small and average production levels in these settings are low, these premiums would only lead to an increased income for coffee farmers of 20 USD per year even with a perfect transmission scenario, and therefore would have little effect on the welfare of the average coffee farmer.

I. INTRODUCTION

There is a growing emphasis in international markets on VSS practices, seemingly as a response to enhanced global social and environmental pressure (Giovannucci et al., 2014; Swinnen, 2007; Henson and Reardon, 2005). By guaranteeing the product origin, fair prices to producers, adherence to ethical standards in production and processing, environmental sustainability, and safety and quality safeguards, international buyers and consumers are often willing to pay extra for a product. Conversely, adhering to those new requirements can be expensive with costs coming from several sources. For example, VSS certified organizations are required to put in place environmental, labor, and safety standards and also put documentation systems in place to monitor the production process. These changes might be costly to impose. The certifying organization's charges can also be substantial (de Janvry et al. 2014). This often raises questions about who actually benefits from the imposition of these standards and if these VSS achieve their objectives (Haight 2011).[1]

The coffee sector has led the field in applying different VSS (Potts et al. 2014). In this global sector - one of the most important traded agricultural commodities in the world - it is estimated that 18 percent of coffee production will be VSS certified in 2015, up from 4 percent in 2005 (Giovannucci et al. 2014). This share is expected to reach significantly higher levels in the near future (Pierrot et al. 2011; Giovannucci et al. 2014; Potts et al. 2014).[2] Despite the increasing global demand for VSS and the large share of coffee producers that supply their products under these schemes, there are relatively few studies that examine the impacts of these arrangements on coffee producers or on the distribution of costs and benefits along the coffee supply chain. Most available studies have focused on identifying the impacts on the producer level. The findings are mostly mixed, with some exposing positive impacts (e.g. Ruben and Fort 2012; Wollni and Zeller 2007; Weber 2011; Barham and Weber 2012; Dragusanu et al. 2014; Rueda and Lambin 2012; 2013; Chiputwa et al. 2015), while others are more critical and find little effect (e.g. Jena et al. 2012; Cramer et al. 2014; Haight 2011; de Janvry et al. 2014; Dragusanu and Nunn 2014; Stellmacher and Grote 2010; Valkila and Nygren 2009; Beuchelt and Zeller 2011). In Africa especially, there are few studies on this, possibly because of the lower uptake of VSS than in the rest of the world (CTA 2013).

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[1] In the literature, there are opposing views on the impact of standards on smallholders in developing countries. On the one hand, certification has been found to be beneficial and smallholders are able to thrive under the imposition of more stringent standards (e.g. Minten et al. 2009; Kersting and Wollni 2012; Wang et al. 2009; Kleeman et al. 2014). On the other hand, there are findings that the impact of standards is minimal or negative (Jena et al. 2014; Dragusanu & Nunn 2014). Reardon et al. (2009) even find that standards can lead to the exclusion of smallholders in these agricultural value chains, especially when firms have procurement options.

[2] For example, the Sustainable Trade Initiative has an agreement with major roasters towards increasing global sustainable coffee sales to 25 percent in 2016. See http://www.idhsustainabletrade.com/koffie-news.

We look at this issue in the case of the coffee sector of Ethiopia, its most important export product which accounts for about a quarter of its foreign exchange earnings.[3] We examine how the benefits of VSS – in particular Fairtrade and Organic certification – are distributed between export and production levels. Our contribution to the literature is two-fold. First, this is the first study that looks at the quality premiums paid for VSS at different levels in the value chain in producing countries, and it therefore allows us to understand the benefits at each level. Second, we use exceptionally rich datasets, i.e. a census of coffee transactions over a nine-year period, a time-series of coffee producer prices over an eight-year period, and a comprehensive representative survey of 1,600 coffee producers. This producer survey is significantly more extensive than any other survey used to examine VSS schemes. This provides confidence in our findings for Ethiopia, the biggest coffee producing country in Africa.

We find that there are statistically significant quality premiums attached to VSS certified coffee at the export level. However, there are only small price premiums at the producer level – producers received only one-third of the quality premium for VSS certification realized by coffee exporters. The gap in effective transmission is seemingly explained by significant overhead and certification costs and by investments in communal services that might not directly improve the prices received by individual producers. Compliance costs at the cooperative and household level also are often found to be high. Moreover, we find that, even if the transmission of premiums were more efficient, it would likely result in limited impact on the welfare of poor farmers. If an average Ethiopian coffee farmer, who annually sells the equivalent of 400 kilograms of red cherries, were to market all his or her red cherries as VSS certified, with current VSS premium transmission rates, the farmer's annual income would increase by 144 Birr or 7.5 USD. Even in the case of a perfect transmission, the annual income of the average coffee farmer would only increase by 20 USD. These premiums from VSS certification are unlikely to significantly contribute to improving the welfare of coffee producers. The findings of our study therefore raise doubts on some of the fundamental propositions of VSS.

The structure of the paper is as follows. First, we provide some background information on VSS in the coffee sector. In Section 3, we describe the data used for this study. Section 4 presents a conceptual framework and empirical methodology. In Section 5, we describe VSS certification patterns in Ethiopia. Empirical results on the quality premiums and its transmission between different layers in the value chain are presented in Section 6. In Section 7, we test to what extent VSS certification achieves its intended objectives. We then finish with a discussion of the findings.

2. VOLUNTARY SUSTAINABILITY STANDARDS (VSS) IN COFFEE

Concerns for producers' income combined with those for social injustice and environmental destruction have led to a global movement for sustainability standards (Giovannucci et al. 2014; Pierrot et al. 2011). The demand for VSS certification for coffee arguably took off globally in early part of the 2000s when the international price of coffee declined dramatically, creating hardships for many poor smallholder coffee producing households. In 2005, it was estimated that 4 percent of all green coffee was VSS certified. This has grown quickly since then and it is estimated that this share has now reached almost 20 percent of the global trade in coffee (Giovannucci et al. 2014). The main sustainability standards include Fairtrade, Organic, Rainforest Alliance, Utz Certified, and 4C Code of Conduct (Potts et al. 2014).

The Fairtrade movement has its origin in an initiative started in Netherlands in 1988 by a church-based NGO in response to low coffee prices. This initiative led to the start of the Fairtrade Labeling Organization (FLO) in 1997. The vision of the initiative was to ensure that producers would realize sufficient incomes by assuring min-

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[3] In Ethiopia, there are a number of studies that have examined issues of coffee certification. There are two major drawbacks to previous studies. First, several of these studies were qualitative (e.g. Stellmacher & Grote 2011) and fail to illustrate quantitative impacts. Second, when surveys were fielded, they were limited spatially or only focused on one type of certification (e.g. Kodama 2009; Jena et al. 2012; and Cramer et al. 2014).

imum prices and price premiums and by guaranteeing social standards. Organic certification, a second VSS, ensures that the coffee has been produced under organic standards. It emphasizes systems that promote and enhance agro-ecosystem health, including biodiversity, biological cycles, and soil biological activity. For a lot of coffee to obtain an organic certificate, it is required that no inorganic inputs have been used on the farm for two years prior to obtaining the crop. There is often double certification where Fairtrade and Organic certifications have been combined: Pierrot et al. (2011) estimate that this combination made up 42 percent of global Fairtrade coffee. Notably, these two VSS were the first to be implemented globally.[4]

A number of other more recently developed certification schemes are now also important globally, but less so in Ethiopia. Utz certification uses social and environmental criteria, promotes better business practices, and focuses on a tracking system to ensure that coffee producers implement good agronomic practices, which the industry then rewards (Potts et al. 2014). Rainforest Alliance certification aims to ensure sustainable livelihoods by transforming land-use, business practices, and consumer behavior (Potts et al. 2014). Independent certification by separate global certification organizations is required for these four major VSS. The 4C ("Common Code for Coffee Community") Association aims to establish a code of conduct for global coffee trade. In contrast with other VSS, the 4C initiative relies on self-assessment and a three-year verification cycle (Panhuysen and Pierrot 2014). Two other VSS initiatives belong specifically to private companies that have their own standards. CAFÉ (Coffee and Farmer Equity) Practices is a green coffee sourcing program developed by Starbucks in collaboration with Conservation International. Nespresso AAA guidelines have a similar set-up.

Figure 2.1 shows at the global level the importance of the different types of VSS, indicating production as well as sales estimates under each in 2013. Although it is one of the most recent initiatives in VSS in coffee trade, the 4C Association compliant coffee is by far the most important. While Organic and Fairtrade were traditionally the most adopted VSS in the global coffee sector, Rainforest Alliance and Utz Certified are growing much faster than Organic or Fairtrade, as they provide less challenging requirements in some areas and more business-friendly approaches (Giovannucci et al. 2014). Figure 2.1 also shows that a significant portion of coffee that is produced under VSS is not sold under that label. It was estimated in 2013 that 40 percent of the global coffee production was produced under one of these VSS, but that only 15 percent was actually sold using a VSS-certified label (Panhuysen and Pierrot 2014).

Figure 2.1—Prevalence of Voluntary Sustainability Standards in global coffee sector, 2013
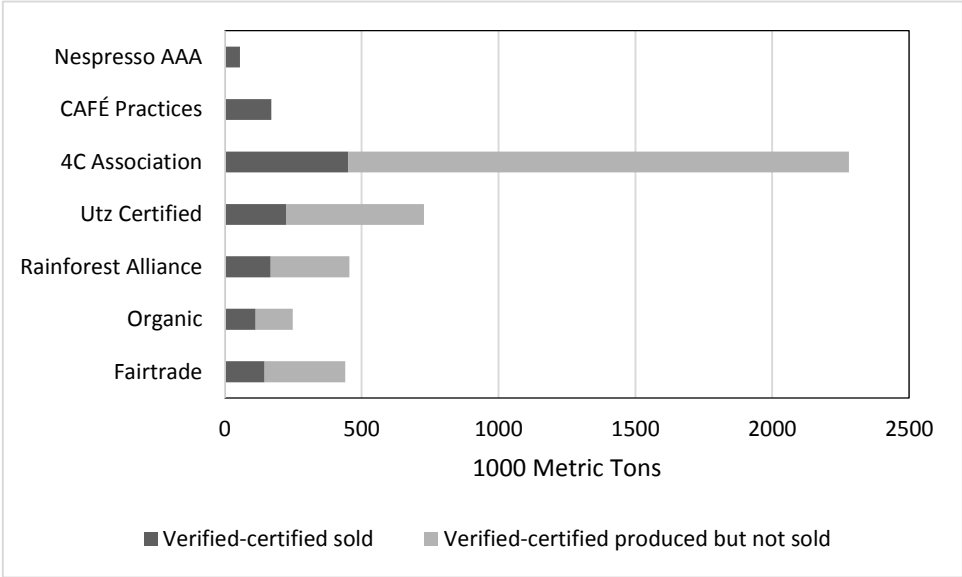

Source: Panhuysen and Pierrot (2014).

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[4] Initially, Fairtrade certification could only be granted to groups of smallholders organized in producer organizations. However, this is no longer true for all product types. Fairtrade can now be achieved by both small producer organizations and larger commercial organizations that hire-in labor.

VSS certification of coffee is a relatively new phenomenon in Ethiopia. In 2000, only one certifier in the country was accredited to issue these certificates. Since 2006, however, the country has attracted several international certifiers, including for Fairtrade, Organic, Utz, and Rainforest Alliance (Stellmacher and Grote 2011). A number of cooperatives and commercial farms have since obtained certification for their export coffee under different schemes. It is estimated that only 18 cooperatives were Fairtrade certified in 2003, but that by 2013 111 cooperatives were Fairtrade certified. Organic certification is also widely implemented by these cooperatives. However, while there has been an increase in the last decade, the adoption of VSS certificates in Ethiopia has been significantly below world averages (Figure 2.2). It is estimated that VSS certified exported coffee from Ethiopia made up 2 percent of all Ethiopian coffee exported in 2005. This value rose to 5 percent by 2015.

Figure 2.2—Evolution of Voluntary Sustainability Standards in the coffee sector, globally and in Ethiopia
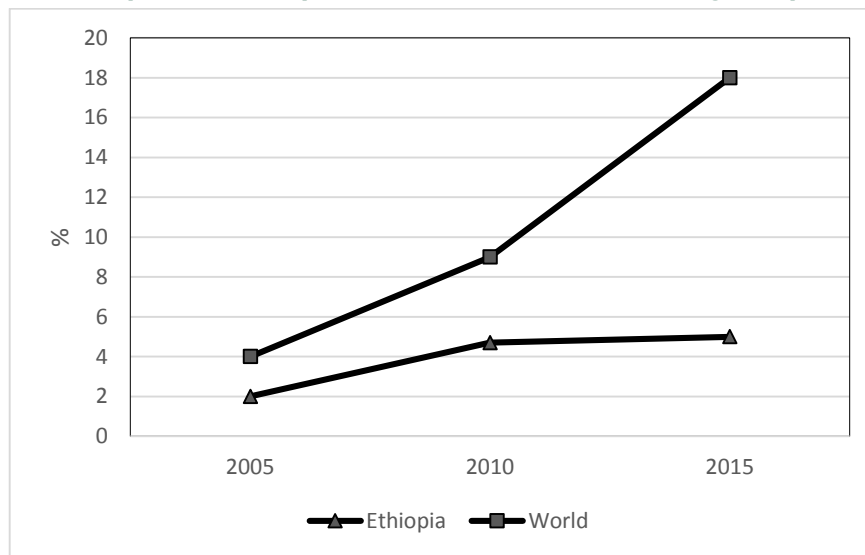
Source: Giovannucci et al. (2014) for world; Kodama (2009) and authors' estimates for Ethiopia.

3.   DATA

To study voluntary sustainability standards, we rely on different unique large-scale datasets. In all our datasets there is significant overlap of certifications, especially of Fairtrade and Organic. Consequently, we are unable to analyze the effects of each VSS separately.

First, a survey with 1,600 producers was fielded in February 2014. We focused on those zones that produced the most coffee in the country. To select the producers for the survey sample, the zones were stratified based on the coffee variety produced, as classified for export markets (Sidama, Jimma, Nekempte, Harar, Yirgacheffe). Within each of these five strata, woredas were ranked by total production. Two woredas were randomly selected from the more productive half of woredas and two from the lower producing half of woredas. A list of all the kebeles from these selected woredas was obtained and their annual coffee production levels determined. Two kebeles were randomly selected from the more productive half of kebeles and two from the lower producing half of kebeles in these woredas. Finally, a list of all coffee-producing households in the selected kebeles was developed. These households were ranked from small to large coffee producers based on area cultivated in the year before the survey. We divided the producers into two groups, the less productive and the more productive. 20 coffee producers in each kebele were then selected: 10 from the less productive group of producers and 10 from the more productive ones. In total, 16 kebeles were chosen in each of the survey strata, from which 20 coffee producers were selected for the survey sample. Thus, 320 producers were interviewed in each stratum, for a total sample size of 1,600 producers across the five strata.

Second, we collected information on prices offered to producers from primary cooperatives and private traders in major producing areas. Price data were collected from 12 major coffee producing zones in the country.

In each zone, the three top producing woredas were selected and all primary cooperatives in each were visited. For each cooperative visited, we inquired if they had kept records on transaction prices, quantities, and total amounts paid out over the last 9 years and, if so, in what form these records were kept, i.e. receipts or a "record book". In the case where a transactions record book was maintained, we photocopied the book in the nearest town, and those data were subsequently entered into a database. Using this survey method, we were able to collect price information from 89 cooperatives and 138 private traders. Moreover, a survey of cooperative unions was conducted in July 2014. Information was obtained on all certification types, the number of certified cooperatives in the union, start-up dates of certification, quantities exported under these certificates, and the premiums obtained from these certificates.

Third, a database of coffee export transactions is maintained by the Ministry of Trade. This dataset was obtained for the period July 2006 to June 2014. An important aspect in coffee exports is quality. Quality assessments for exports are conducted by the Coffee Liquoring Unit (CLU) to ensure that the coffee meets export standards. A quality inspection sheet is prepared by the CLU and is attached to the lot to be exported.[5] These quality indicators, as well as others (such as washing, certification, and origin), are part of the coffee export transactions dataset.[6]

Finally, we obtained a list of private commercial coffee farms (with cultivated areas of 40 hectares and above) from the association of commercial coffee farms. This information was integrated into the dataset for analysis as well.

4. CONCEPTUAL FRAMEWORK AND EMPIRICAL METHODOLOGY

To motivate our empirical analysis, we follow the theoretical model developed by Lancaster (1966). We consider a food product (or a group of food products) as a collection of characteristics or attributes. A food product i can be described by a vector of attributes $x_i = \{x_i^0, x_i^1, ... x_i^N\}$ with x_i^k the level of attribute k in good i. Attributes are defined in such a way that consumers derive positive utility from them: $U = U(x^0, x^1, ... x^N)$ with $\partial U / \partial x^k \geq 0$. For reasons of simplicity, we assume that U is measured in monetary equivalent. If two food products i and j differing only in attribute k are offered in the market, their price difference will adjust to the point where consumers are indifferent between the two:

$$U(x_i^0, ..., x_i^k, ... x_i^N) - p_i = U(x_j^0, ..., \tilde{x}_j^k, ... x_j^N) - p_j \tag{1}$$

$$p_i - p_j \approx \frac{\partial U}{\partial x^k}(x_i^k - \tilde{x}_j^k) \tag{2}$$

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[5] The analysis of coffee quality by the CLU is based on two measures, the raw and physical inspection and the cup inspection. The raw and physical inspection contributes 40 percent of the final quality grade, while the cup inspection contributes 60 percent. However, moisture and screen analysis are the two requisites before grading any coffee. The moisture content should be less than 11.5 percent, while the size of the bean should be above screen size 14 for 85 percent of the bean sample. In the case of unwashed coffee, raw quality is determined based on defect count of the beans and on odor. In the case of washed coffee, the raw quality is based on an assessment of shape and make, color, and odor. Cup quality is assessed along four criteria – cup cleanliness, acidity, body, and flavor. Each characteristic counts equally for the cup quality value. The washed coffee export standards vary between grade 1 and 2, as well as under-grade (UG), while unwashed coffee is graded 3, 4, 5, or under-grade. Within the under-grade category, a further distinction is made for under-grade type 'inferior, but exportable' coffee, while the worst under-grade coffee is not exportable and is destined for domestic consumption.

[6] It is not possible to completely control for quality in the specialty market using information from CLU grading. Specialty buyers usually disregard CLU grades altogether and cup and grade the coffee themselves. These grades of the specialty buyers determine the (sometimes very high) prices they pay, but are not recorded in our dataset. However, the number of such purchases are not sufficiently common to influence our study results.

The price differential between the two food products can thus be regarded as the implicit price of attribute k.[7] We assume agricultural producers have identical production possibility frontiers $G(x, l) \leq 0$, where l is the vector of inputs required to produce a vector of attributes x. Positive values of G correspond to inefficient input/output combinations.

The efficient allocation is obtained by solving a social planner problem of the form:

$$\max_{\{x,l\}} U(x^0,...,x^N) - \sum_{n=1}^{M} p_n l_n \qquad (3)$$

subject to: $G(x^0,...,x^N;l_1,...l_M) \leq 0$, which yields first order conditions of the form:

$$\frac{\partial U}{\partial x^k} - \lambda \frac{\partial G}{\partial x^k} = 0 \qquad (4)$$

$$-p_n - \lambda \frac{\partial G}{\partial l_n} = 0 \qquad (5)$$

At the optimum, the price (p) of the (group of) food product(s) equals the Lagrange multiplier λ. From equations (1) and (2), it follows that:

$$\frac{dp}{dx^k} = \frac{\partial U}{\partial x^k} = p \frac{\partial G}{\partial x^k} \qquad (6)$$

This implies that, in an efficient equilibrium, the price premium associated with attribute k is equal to the marginal utility of that attribute (expressed in monetary equivalent) and is equal to the marginal cost of producing the attribute.

If we assume the marginal utility and the implicit price for each characteristic to be constant, a hedonic price regression can be estimated where the food price is a function of the characteristics of the product, which are determined by the choice of a particular variety, or by the specific post-harvest technologies used. A simple model of the following form can then be estimated:

$$p = \sum_{k=0}^{N} \beta_k X^k + v \qquad (7)$$

where p is the price of the product, X^k is the level of the attribute k, β_k the implicit price of attribute k, and v a stochastic error term. We apply this general model to the issue that we like to study.

In particular, we estimate the impact of VSS certification on price formation at different levels in the value chain by the following estimation strategy:

$$p^m_{jt} = \beta_0 + \beta_1 * VSS^m_{jt} + \sum_i \beta_2 * X^m_{ijt} + \sum_j \beta_3 * \alpha^m_j + \sum_t \beta_4 * \eta^m_t + v_{jt} \qquad (8)$$

where p^m_{jt} represents the coffee price of firm j at time t at level m in the value chain, VSS_{jt} is a binary variable equal to 1 in time t when the buyer has a VSS certificate and 0 otherwise, X_{ijt} is a vector of i variables that affect producer price levels such as quality, origin of the coffee, or quantity sold. α_j are buyer fixed effects, while η_t are monthly fixed effects. The parameter that we are interested in is β_1, which captures the effect of a VSS for the

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[7]If utility is additively separable, i.e., if $U_i = \sum_{k=0}^{N} \alpha_k x_i^k$, the formula holds exactly: $p_i - p_j = \alpha_k (x_i^k - \tilde{x}_j^k)$

buyer. The assumptions for this specification to be valid is common trends among VSS and non-VSS buyers and conditional independence between the price outcome variable and the VSS variable. This type of regression is run at two levels in the value chain, at the exporter and at the primary cooperative levels. For all specifications of these regressions, robust standard errors were estimated.

5. PATTERNS OF VSS COFFEE CERTIFICATION IN ETHIOPIA

In this section, we look at a number of patterns in VSS certification in the coffee sector in Ethiopia. We address three questions consecutively. First, how important is VSS certification in coffee export in Ethiopia and how is it changing over time? Second, what types of VSS certificates are in vogue and where are they mostly implemented? Third, what are the characteristics of the coffee that is exported under VSS certification?

Table 5.1 gives an overview of total exports of coffee from Ethiopia over the period 2007 to 2013. Despite large variability between years, coffee exports have been increasing over this period, from 156,000 metric tons (mt) in 2007 to 172,000 mt in 2013. Coffee exports are mostly in the hands of the private sector. While the share of cooperatives in exports is increasing, it is still minor: they made up 6 percent of total exports in 2013, increasing from 5 percent in 2007. The share of VSS certified coffee in total exports is relatively small. Over the period considered, it varied from a low of 3.1 percent in 2008 to a high of 5.3 percent in 2011. Most of the VSS certified coffee is exported by cooperatives, and the majority of coffee that is exported by cooperatives is VSS certified – in the last 3 years, VSS certified coffee varied between 72 and 75 percent of all exports by cooperatives. Some private firms also export VSS certified coffee, almost all organically certified. However, their importance is relatively small in the total exports of VSS certified coffee from Ethiopia, i.e. 12 percent in 2013.

Table 5.1— Certified coffee exports from Ethiopia, 2007 to 2013

| | Coffee exports | | | Certified coffee | | | | By non-cooperatives |
| | | | | | | By cooperatives | | |
year	Total (mt)	By cooper-atives (mt)	Share of total exports from cooperatives (%)	Total (mt)	Share of total exports (%)	mt	% of exports of cooperatives	mt
2007	156,157	7,541	4.8	6,352	4.1	5,708	75.7	644
2008	170,433	7,242	4.2	5,210	3.1	4,011	55.4	1,199
2009	111,035	7,690	6.9	4,541	4.1	4,277	55.6	264
2010	199,478	10,703	5.4	9,438	4.7	8,922	83.4	516
2011	160,523	10,302	6.4	8,475	5.3	7,552	73.3	923
2012	192,150	11,073	5.8	9,494	4.9	8,351	75.4	1,143
2013	172,247	10,460	6.1	8,482	4.9	7,487	71.6	995

Source: Authors' calculations based on data from the Ministry of Trade

Table 5.2 gives an overview of the different types of VSS certification to which cooperatives adhere. About one-third of the primary coffee cooperatives – which are subsequently organized into cooperative unions – in Ethiopia have VSS certification. Organic certification is the dominant VSS, with 136 accredited primary cooperatives. They are spatially clustered – about half of the organic-certified cooperatives are from the Sidama and Yirgachefe cooperative unions. 29 percent of all the primary coffee cooperatives are organically certified. The next most important VSS certification in Ethiopia is Fairtrade. There are 128 primary cooperatives that are Fairtrade accredited. The Oromia and Sidama cooperative unions have the largest number of Fairtrade-certified cooperatives. They jointly account for about two-third of all Fairtrade-certified cooperatives in Ethiopia. The other two types of VSS certificates prevalent in Ethiopia, Rainforest Alliance and Utz Certified, are not yet widely adopted. Out of all the cooperatives, just 2 percent of cooperatives are certified with one or the other of these two VSS schemes.

Double certification of Fairtrade and Organic is common, with 98 percent of Organic certified cooperatives also having Fairtrade certification, and similarly 80 percent of Fairtrade certified cooperatives also having Organic certification. Moreover, cooperatives that are certified under the Utz Certified or Rainforest Alliance VSS schemes are also Organic and Fairtrade double-certified (for more discussion, see Hoebink et al. 2014). Notably, while the Oromia union is the largest in the country, the number of certified primary cooperatives is lower in the Oromia union than in the coffee cooperative unions of Yirgacheffe and Sidama, possibly due to poorer administration capacity at the primary cooperative levels and poorer quality coffee in Oromia.

Table 5.2—Number of VSS certified primary cooperatives

Cooperative union	Number of primary cooperatives	Any VSS certificate	Type of VSS			
			Organic	Fairtrade	Rainforest Alliance	Utz Certified
Sidama	47	89.4	83.0	87.2	6.4	10.6
Yirgacheffe	26	100.0	100.0	100.0	11.5	7.7
Oromia	250	16.4	9.6	16.4	1.2	1.2
Limmu Inara	27	59.3	59.3	18.5	0.0	0.0
Wolaita Damota	42	23.8	23.8	0.0	0.0	0.0
Kaffa	34	55.9	52.9	44.1	0.0	0.0
Bench Maji	39	7.7	7.7	0.0	0.0	0.0
Total	465	33.8	29.2	27.5	1.9	2.2

Source: Authors' calculations based on data collected from the cooperative unions.

As described earlier, one challenge for VSS certification is quality. For VSS certifications that guarantee a price floor or a fixed premium above the market price, it has been argued that there might not be an incentive to ensure quality (de Janvry et al. 2014). To understand the links of quality and different associated variables with VSS certification in Ethiopia, we present the results of a probit regression where we regress VSS certification of the exported lot on a number of associates (Table 5.3). We find a strong influence of origin on the likelihood of VSS certification. Coffee from zones of origin other than Sidama is less likely to be certified. Cooperatives and private commercial farms are significantly more likely to export certified coffee, as discussed above. From these findings, better quality coffee is also shown to be significantly more likely to be exported under a VSS certification scheme.[8] The coefficients of unwashed and under-graded coffee are significant and negative, indicating that they are significantly less likely to be exported as a VSS certified coffee. In contrast with other countries (de Janvry et al. 2014), it might be that quality is easier to maintain for VSS certification in Ethiopia because of credible and mandatory third-party quality assessments by the CLU and the Ethiopian Commodity Exchange (ECX).

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[8] This does not have to be the result of the VSS schemes, which do not certify quality. It can be that certified cooperatives get better at making good coffee. But, it could also be the result of self-selection of the best cooperatives into VSS status, and that the NGO programs that support cooperatives in a variety of ways related to quality also help them gain certification.

Table 5.3—Associates of VSS certification at the export level

	Certification	
	Coef.	z-value
Washed coffee (grade 2 = default)		
Grade 1	0.71	**5.76**
Under-graded	-0.49	**-4.15**
Unwashed coffee		
Grade 3	0.61	**6.63**
Grade 4	-0.16	**-3.06**
Grade 5	-0.89	**-8.95**
Under-graded	-0.98	**-3.28**
Type of exporter (default=private)		
Cooperative	3.31	**77.96**
Parastatal	0.00	-
State farm	0.00	-
Private commercial farm	1.80	**28.70**
Region of origin (default=Sidama)		
Jimma	-0.16	-1.60
Wollega/Nekempte	-0.39	**-3.61**
Yirgacheffe	-0.13	**-2.75**
Limu	-0.87	**-11.98**
Harar	-0.23	**-2.90**
Other	-0.19	-1.60
Year (default=2006)		
2007	0.03	0.26
2008	-0.12	-0.94
2009	-0.38	**-3.09**
2010	0.04	0.34
2011	0.08	0.69
2012	0.14	1.16
2013	-0.08	-0.70
2014	-0.20	-1.63
Intercept	-2.25	**-19.75**
Observations	33,851	
Wald Chi^2 (29)	7,935	
Prob>Chi^2	0.00	
Pseudo R^2	0.70	

Source: Authors' calculations based on data from the Ministry of Trade.

Note: Robust standard errors; z-values in bold are significant at the 5 percent level.

We find that VSS certification in Ethiopia has not yet taken off in a major way. However, when it is applied, it is mostly done by cooperatives using Fairtrade and Organic certification. Most of the coffee that is VSS certified is higher quality washed coffee. To understand to what extent prices and incentives matter for VSS certification at different levels in the value chain, we look in the next section at quality premiums for VSS certification at export and producer levels.

6. QUALITY PREMIUMS FOR VSS CERTIFICATION

6.1. Export level

Simply using observed prices of each exported lot expressed in US cents per lb., Figure 6.1 illustrates the size of the certification premium over the period 2006 to 2014. The density function of VSS prices of certified coffee is

distinctively to the right of non-certified coffee, indicating significant premiums at the export level. The average price difference amounts to 88 US cents per lb., statistically different when measured with a t-test (t=-78.61; Pr(|T|>|t|)=0.00). However, this simple price comparison masks other factors that might explain the VSS certification premiums. As seen above, mostly better quality coffee is used for VSS certification and to get at the additional value of certification on top of other variables, a multi-variate regression framework is required.

Figure 6.1— Export quality premiums for VSS certification of clean green coffee, 2006 to 2014
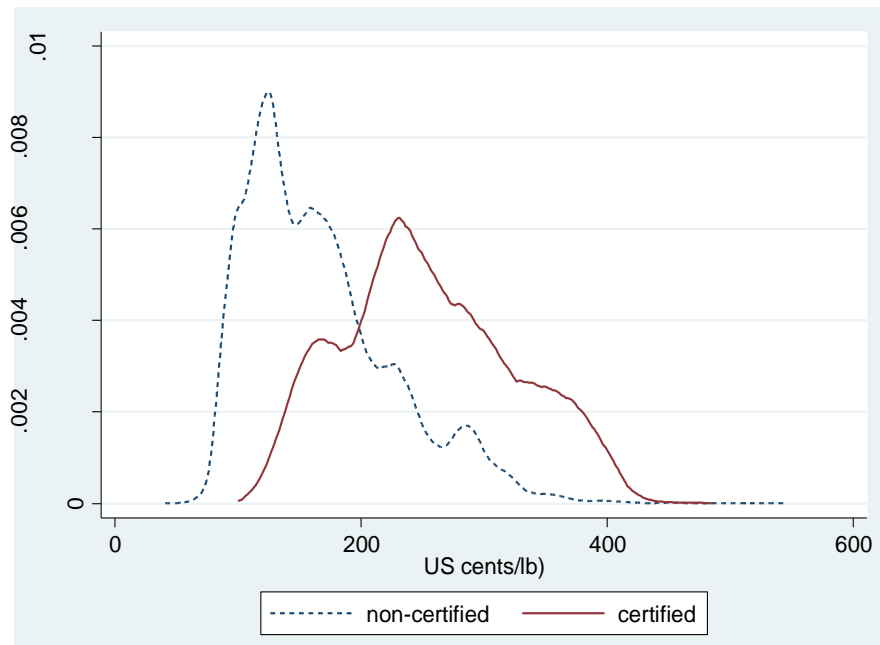
Source: Authors' calculations based on data from the Ministry of Trade.

Following the methodology outlined in Section 4, we regress export prices of clean green beans in US cents per lb. on VSS certification, quantity exported, quality indicators, the origin of the coffee, type of exporters, and monthly dummy variables (Table 6.1). In the first specification, we report the results of a pooled regression. The results show that coffee exported by cooperatives and private commercial farms obtains higher export prices compared to coffee exported by private exporters, even if we control for quality. In this case, certification raises the price of exports by 22 US cents per lb. When we control for exporter fixed effects (Specification 2), we find that certification raises prices significantly by 15 US cents per lb. This represents, on average over the period considered, 7 percent of the coffee export price. When we run the exporter fixed effect model for cooperatives only (the third specification), VSS certification shows a premium of 11 US cents per lb., *ceteris paribus*. We are specifically interested in the premiums applied in recent years. We therefore restrict the sample to the years 2013 and 2014. In those specifications, we find that VSS certification raises coffee prices by 11 and 14 US cents per lb. (as shown by the size of the coefficients for the VSS certification dummy variable) in a specification where all exporters are included (Specification 4) or where the sample is restricted to cooperatives only (Specification 5), respectively. The evidence suggests that there are statistically significant but small premiums of about 7 percent of the export price for coffee for VSS certification at the export level, slightly higher than those found in other studies for similar periods (de Janvry et al. 2014).

Table 6.1—Determinants of coffee prices (US cents per lb.) at the export level, 2006 to 2014

	Unit	Specification 1		Specification 2		Specification 3		Specification 4		Specification 5	
		Coef.	t-value	Coef.	t-value	Coef.	t-value	Coef.	t-value	Coef.	t-value
VSS certificate	yes=1	22.17	**16.16**	15.33	**7.51**	11.47	**4.19**	10.59	**2.37**	13.66	**2.80**
Quantity exported	log()	-4.99	**-16.24**	-4.07	**-5.77**	-5.79	**-12.17**	-4.67	**-5.16**	-7.11	**-32.40**
Washed coffee (grade 2 = default)											
Grade 1	yes=1	53.30	**23.13**	44.66	**7.25**	36.31	**3.35**	40.51	**8.30**	37.87	**5.00**
Under-grade	yes=1	-39.26	**-39.58**	-39.30	**-10.94**	-51.27	**-2.81**	-32.15	**-5.89**	-47.66	**-2.81**
Unwashed coffee											
Grade 3	yes=1	28.94	**11.50**	21.12	**3.25**	2.50	0.22	36.86	**4.32**	-6.77	-0.65
Grade 4	yes=1	-44.84	**-90.14**	-43.01	**-21.83**	-32.61	**-2.79**	-39.67	**-13.42**	-55.22	**-3.79**
Grade 5	yes=1	-55.69	**-59.17**	-50.31	**-14.34**	-29.90	**-3.27**	-43.91	**-9.34**	-61.58	**-6.25**
Under-grade	yes=1	-80.04	**-68.71**	-68.30	**-17.16**	-116.40	**-3.74**	-72.11	**-12.16**	-255.61	**-17.43**
Region of origin (default=Sidama)											
Jimma	yes=1	-6.01	**-6.67**	-7.36	**-2.50**	-29.78	**-5.77**	-5.50	-1.21	-34.34	**-6.07**
Wollega/Nekempte	yes=1	-1.01	-1.24	-2.97	-1.15	-22.35	**-4.87**	2.05	0.65	-32.65	**-3.77**
Yirgacheffe	yes=1	19.69	**31.79**	20.71	**10.10**	20.38	**4.13**	20.63	**7.26**	11.94	1.93
Limu	yes=1	-11.69	**-14.07**	-11.30	**-7.93**	-12.53	**-3.10**	-5.98	-1.56	1.72	0.32
Harar	yes=1	54.60	**44.35**	51.60	**18.64**	47.31	**6.79**	121.68	**29.55**	143.58	**16.85**
Other	yes=1	-0.18	-0.15	-3.20	-0.59	-13.88	-0.89	0.06	0.01	116.67	**12.98**
Type of exporter (default=private trader)											
Cooperative	yes=1	34.26	**26.61**								
Parastatal	yes=1	-6.75	**-10.25**								
State farm	yes=1	-13.84	**-14.01**								
Private commercial farm	yes=1	5.70	**4.87**								
Monthly dummies included		yes		yes		yes		yes		yes	
Exporter dummies included		no		yes		yes		yes		yes	
Intercept		276.39	**68.08**	223.45	**22.61**	221.56	**37.80**	251.64	**27.66**	308.965	**62.48**
Period		2006-2014		2006-2014		2006-2014		2013-2014		2013-2014	
Type of exporters		All		All		Only coops		All		Only coops	
Number of observations		35,471		35,471		3,741		7,856		872	
Number of groups				285		9		194		7	
R-squared		0..83		0.79		0.84		0.66		0.53	

Source: Authors' calculations based on data from the Ministry of Trade

Note: Robust standard errors; t-values in bold are significant at the 5 percent level.

6.2. Producer level

We first present qualitative information from the 2014 coffee producer survey on farmer access to cooperatives and their price perceptions. Almost 40 percent of farmers in our survey had the option to sell to cooperatives (Table 6.2). Half of the farmers that had the option to sell to cooperatives sold to them. There is a significant difference in those with access to certified or non-certified cooperatives. Those that had the option to sell to a certified cooperatives are much more likely to proceed with a sale to them than those that had access to a non-certified cooperative. Table 6.2 shows that cooperatives mostly focus on the procurement of red cherries, that are later processed as washed coffee. Farmers were further asked about the prices offered by cooperatives compared to other buyers. Some 43 percent of farmers believe that prices are higher while 28 percent and 22 percent think they are lower or the same, respectively.

Table 6.2—Access to cooperatives and price perceptions

| | | | Cooperatives | | |
	Unit	Observa-tions	Non-cer-tified	Certified	All
Farmer stated that they had option to sell to a cooperative	%	1,598	21.2	18.2	39.4
Share of farmers that sold red cherries to cooperatives	%	1,598	2.4	14.6	17.0
Share of farmers that sold dry cherries to cooperatives	%	1,598	2.4	0.4	2.8
Share of farmers that sold coffee to cooperatives	%	1,598	4.7	14.6	19.3
For those having option to sell to cooperatives					
Cooperatives buy:					
"Red cherries only"	% yes	394	30.1	90.0	62.3
"Dried cherries only"	% yes	144	48.0	1.2	22.3
"Both red and dried cherries"	% yes	94	21.9	8.9	14.9
Total	% yes	632	100.0	100.0	100.0
Cooperatives' prices for red cherries are:					
"Higher"	% yes	210	35.4	46.6	43.2
"Lower"	% yes	137	3.4	38.9	28.2
"The same"	% yes	106	44.9	11.8	21.8
"I do not know"	% yes	33	16.3	2.6	6.8
Total	% yes	486	100.0	100.0	100.0

Source: Authors' calculations based on ESSP's coffee producer survey 2014

To analyze quality premiums of VSS certification at the producer level, we use a time series of producer prices over an eight-year period from 2005 to 2012 that was collected from cooperatives and private traders. For each cooperative, information was obtained on the exact time that VSS certification was obtained. As most certified buyers focus on red cherries, we mostly use prices of those cherries as our dependent variable, converted to US cents per lb. The results of different specifications are presented in Table 6.3. We first run a pooled regression where we regress the price of cherries on a VSS certification dummy variable, the bean form, type of buyer, an origin variable, and monthly dummies. As expected given their lower conversion ratio to exportable clean green beans, red cherries get significantly lower prices per kg compared to dried cherries and coffee beans. As found at the export level, we find significantly higher prices for producers in Harar and Yirgacheffe compared to Sidama, and significantly lower ones for Jimma and Nekempte, indicating that these origin premiums at the export level are transmitted to producers. In this specification, we find that certification raises producer prices by 0.94 US cents per lb. In a second specification, we only focus on red cherries. In this case certification raises prices by 1.56 US cents per lb. In a third specification, we include fixed effects for buyers. In this model, we find that VSS certificates do not raise the producer price. This result is robust to a specification where we only include cooperatives (specification 4) and where we focus only on the most recent period (Specification 5). This evidence suggests that VSS certification did not lead to higher producer prices over the period considered.

Table 6.3—Determinants of prices of red cherries (in US cents per lb.) at the producer level, 2005 to 2013

	Unit	Specification 1 Coef.	Specification 1 t-value	Specification 2 Coef.	Specification 2 t-value	Specification 3 Coef.	Specification 3 t-value	Specification 4 Coef.	Specification 4 t-value	Specification 5 Coef.	Specification 5 t-value
VSS certificate	yes=1	0.94	**13.80**	1.56	**71.34**	0.13	0.48	0.09	0.33	-0.26	-0.58
Type of bean (default=red cherries)											
Dried cherries	yes=1	21.75	**59.78**								
Coffee beans	yes=1	102.02	**65.88**								
Type of seller (default=private)											
Cooperative	yes=1	-0.65	**-5.38**	-1.40	**-31.03**						
Region of origin (default=Sidama)											
Jimma	yes=1	-0.92	**-26.51**	-0.93	**-41.55**						
Wollega/Nekempte	yes=1	-5.02	**-25.34**	-4.10	**-32.38**						
Yirgacheffe	yes=1	2.93	**84.52**	2.89	**137.82**						
Limu	yes=1	0.60	**7.60**	1.22	**27.95**						
Harar	yes=1	14.95	**23.89**	22.89	**6.52**						
Monthly dummies included		yes		yes		yes		yes		yes	
Buyer dummies included		no		no		yes		yes		yes	
Intercept		4.90	**40.30**	5.23	**83.16**	4.58	**11.98**	4.43	**11.63**	5.64	**23.55**
Period		2003-2012		2003-2012		2003-2012		2003-2012		2011-2012	
Type of buyers		All		All		All		Coops only		Coops only	
Type of coffee		All forms		Red cherries		Red cherries		Red cherries		Red cherries	
Number of observations		148,558		113,536		113,536		107,736		23,637	
Number of groups						227		66		63	
R-squared		0.86		0.88		0.80		0.81		0.89	

Source: Authors' calculations based on producer prices collected from primary cooperatives and private traders

Note: Robust standard errors; t-values in bold are significant at the 5 percent level.

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One issue with the estimation of premium transmission in the method above might be that cooperatives pay a quality premium only after they have secured a buyer for the lot and have been paid. Some cooperatives also pay dividends. Analysis of prices recorded at the time of the initial transaction might potentially underestimate the benefits of VSS certification. While information on second payments and dividends was not in the record books, questions were asked on the incidence and level of these two payments during the farm survey of 2014 (Table 6.4). For those farmers that sold to cooperatives, 44 percent and 23 percent stated that they received second payments – an additional premium per kg sold – and dividends, respectively, in the 12 months prior to the survey. Certified cooperatives are much more likely to have paid out second payments and dividends to farmers. 55 percent of the farmers who sold to certified cooperatives reported to have received a second payment and 27 percent of them received a dividend. Overall, 66 percent of the farmers that sold to certified cooperatives received an additional payment after the transaction. In the case that a second payment or a dividend was paid, a follow-up question relating to the exact amount was asked. On average, the second payment was 0.9 Birr/kg, equivalent to an extra 0.14 US cents per lb. We also recorded the amounts of dividends that were paid. The median dividend paid out was 240 Birr per receiving household. These responses suggest that coffee incomes received from cooperatives have increased through second payments or dividends, and more so for certified farmers.

Table 6.4—Coffee sales to cooperatives, dividends and second payments

|			Cooperatives		
	Unit	Observations	Non-certified	Certified	All
If farmer sold to cooperative:					
Share of red cherries sold to cooperatives	%	272	80.6	92.0	90.4
Share of dried cherries sold to cooperatives	%	44	77.7	85.0	78.6
Share of farmers that received a second payment	%	307	8.1	55.4	44.0
If received, amount (mean)	Birr/kg	135	1.05	0.89	0.89
If received, amount (median)	Birr/kg	135	0.90	0.80	0.90
Share of farmers that received a dividend	%	308	10.7	27.0	23.0
If received, amount (mean)	Birr	62	1,697	294	475
If received, amount (median)	Birr	62	885	217	240
Share of farmers that received a second payment or dividend	%	307	13.5	66.1	53.4

Source: Authors' calculations based on ESSP's coffee producer survey 2014

To understand to what extent the second payments and dividends are raising producer prices paid to certified producers compared to non-certified ones, we rely on the reported prices for every coffee transaction at the household level during the year 2013. This information was collected during the farm survey. We analyze three types of producer prices from these transactions – the price that was paid immediately after the transaction, the price incorporating the second payment, and the price incorporating all payments (where dividends were converted to benefits per kg sold). Figure 6.2 shows the distribution of the price incorporating all payments for red cherries by market outlet.[9] The graph illustrates that certified cooperatives offer higher prices than non-certified ones and that cooperatives offer in general a higher price than other buyers. However, the graph also shows that the differences in the density functions are rather small.[10]

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[9] We focus on red cherries as VSS certification almost exclusively deals with these.

[10] The average price differences of sales to certified cooperatives versus sales to non-cooperatives and non-certified cooperatives are 1.76 and 1.13 US cents per lb. respectively (both significant with a t-test, i.e. t=7.99 and t=2.96 respectively). There is no significant difference between sales to non-certified cooperatives and those to non-cooperatives (difference of 0.63 US cents per lb. with a t-value of -1.26 and a $Pr(|T|>|t|)=0.21$.

Figure 6.2—Producer quality premiums for VSS certification of red cherries, based on combined prices of first and second payments, by market outlet, 2013
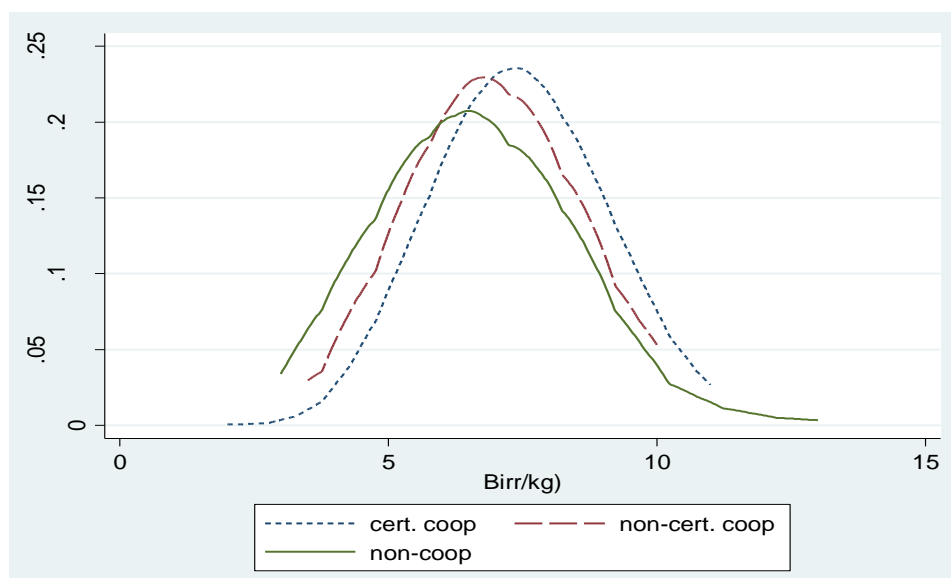
Source: Authors' calculations based on ESSP's coffee producer survey 2014

In Figure 6.2, we do not control for other explanatory variables of price formation. Following the model of Section 4, we therefore regress prices for red cherries on dummy variables that reflect the type of buyer (including sales to a certified and non-certified cooperative), perceived quality of the red cherries, place of sales, month of sales, and woreda dummies. For the dependent variable, we use three price measures: 1/ the first payment; 2/ the first and second payment combined; and 3/ a price that reflects all payments received – the price of the initial transaction, plus the value per unit of coffee sold reflected in the second payment and dividend. We find that cooperatives offer significantly higher prices than other buyers, as seen in the significant positive coefficients of sales to certified and non-certified cooperatives (Table 6.5). We also find that certification raises the price of red cherries, on top of the cooperative effect. However, the difference of prices offered by certified and non-certified cooperatives is not significant (as measured through an F-test) in the first specification, i.e. in the case that the first payment only is used. This confirms the results that were found in Table 6.3. On the other hand, when the full price of red cherries is used as dependent variable, we find a significant price difference of certified cooperatives compared to non-certified ones, shown by the significant F-test at the bottom of Table 6.5.

Table 6.5—Hedonic pricing regression for red cherries at producer level, US cents per lb., 2013 harvest

	Unit	Price 1 First payment (=A)		Price 2 A + 2nd payment (=B)		Price 3 B + dividend	
		Coef.	t-value	Coef.	t-value	Coef.	t-value
Type of buyer (default=non-cooperative)							
Bought by non-certified cooperative	yes=1	1.10	**2.80**	1.38	**3.42**	1.47	**3.60**
Bought by certified cooperative	yes=1	1.54	**3.46**	2.20	**4.78**	2.27	**4.95**
Quantity sold	log()	0.00	0.00	0.13	1.54	0.18	**2.00**
Quality (default=mostly green)							
Mixture of red and green	yes=1	1.00	0.91	0.80	0.73	0.78	0.71
Mostly red	yes=1	1.21	1.57	1.17	1.51	1.19	1.53
Only red	yes=1	1.17	1.57	1.05	1.41	1.04	1.39
Place of sales (default=farmer-trader/collector in village)							
To agent of private miller or huller	yes=1	0.39	1.14	0.35	1.06	0.35	1.07
To agent of cooperative	yes=1	-0.37	-1.01	-0.26	-0.69	-0.10	-0.25
Agent or trader without miller or huller	yes=1	0.12	0.25	0.08	0.16	0.06	0.13
Site of private miller	yes=1	-0.01	-0.03	-0.03	-0.07	-0.01	-0.03
Consumer	yes=1	3.71	0.82	3.86	0.86	3.91	0.86
Other	yes=1	1.30	**3.15**	1.21	**2.93**	1.06	**2.58**
Monthly dummies included		yes		yes		yes	
Woreda dummies included		yes		yes		yes	
Intercept		11.70	**8.18**	11.44	**8.11**	11.36	**8.08**
Number of observations		1,449		1,449		1,449	
R-squared		0.51		0.49		0.49	
F-test if prices offered by certified cooperatives are different from non-certified ones		F()	Prob>F	F()	Prob>F	F()	Prob>F
		1.45	0.23	4.42	**0.04**	4.11	**0.04**

Source: Authors' calculations based on ESSP's coffee producer survey 2014

Note: Robust standard errors; t-values in bold are significant at the 5 percent level.

The difference in price offered between certified and non-certified cooperatives amounts to 0.80 US cents per lb. of red cherries in the third specification. On average, six kg of Arabica red cherries converts to 1 kg of clean green coffee beans (ITC 2011). Prices of these two coffee forms can therefore be compared when a conversion factor of 6 is used. This translates to a 4.6 US cents per lb. green coffee equivalent price at the producer level and compares to premiums at the export level of 13.7 US cents per lb. during the years 2013-2014 (Table 6.1).[11] Using this method, we estimate the transmission of VSS premiums to producers as being one-third of the premium received by exporters of VSS certified coffee.

6.3. What explains the gap?

The evidence presented above show a rather small transmission of VSS premiums at the export level when comparing prices that are paid to coffee producers. It appears that two-thirds of the quality premium is not directly transmitted. This then begs the question about where most of the premium paid for VSS certification at the export level goes. A number of explanations can be forwarded.

First, VSS are implemented by primary cooperatives, organized at the village level, which are grouped in cooperative unions at zonal and regional levels.[12] In the majority of the cases, primary cooperatives do not interact with international buyers, instead the cooperative unions perform the commercial transactions. To pay for the costs that the unions incur, an overhead charge of 30 percent of the quality premium is withheld in the case of organic-certified premiums, but not for Fairtrade-certified. The remaining 70 percent of the VSS premiums goes to

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[11] Using an exchange rate of 19.2 Birr/USD at the end of 2013 when most of the sales of red cherries took place.

[12] As seen in Table 5.2, there are seven such unions in the country.

the primary cooperatives. While the 30 percent allows for the payment of certification costs in some of the cooperative unions, this is not the case for all cooperatives, and the 70 percent transmitted to primary cooperatives is required to cover certification costs. These costs are usually substantial. De Janvry et al. (2014) estimate these costs to be up to 3 US cents per lb. Moreover, a rule is that 70 percent of the profits of the primary cooperatives are transferred to farmers, while the rest is kept for the functioning of the primary cooperative. In the case that a primary cooperative incurs no expenses and the complete quality premium would be considered profits, a maximum of 49 percent (70 percent of 70 percent) of the quality premium would be transmitted.[13]

Second, a common practice in Community-Driven Development projects, with which VSS schemes are commonly associated, is that it is up to the local community, in this case the primary cooperatives, to decide how the extra budget they receive from the VSS certification quality premiums is used (Binswanger-Mkhize et al. 2009). These funds usually are invested in communal assets, such as medical and educational facilities, that provide benefit to coffee farmers in other ways than by higher prices. It is however also possible that the quality premiums are being used for investments that may not directly benefit farmers, such as better facilities or more staff at the cooperative (Haight 2011).

Third, our interviews highlighted that parts of the quality premiums were used by some of the primary cooperatives to pay off debts. These incurred debts are sometimes high because of volatility in international prices, especially in recent years in situations where these cooperatives bought cherries at relatively high prices from farmers and could only sell coffee beans at a low price later in the year. Some cooperatives also invested in the purchase of wet mills by taking out loans.

It is also worth noting that there is frequent oversupply of certified products that cannot be sold primarily because there are not enough buyers for VSS certified products (e.g. de Janvry et al. 2014; Potts et al. 2014). As noted earlier, at the global level, 40 percent of global production in 2012 was estimated to have been produced in compliance with VSS standards, but only 15 percent of that quantity was sold under that label (Potts et al. 2014). These supplies are then sold on conventional markets. In such cases, even though farmers are certified, their coffee would not be sold at a higher price associated with VSS certification. However, in recent years, the majority of the coffee that was sold to the cooperative unions in Ethiopia was sold under a VSS certification label.

7. DO VSS CERTIFICATES ACHIEVE THEIR SUSTAINABILITY OBJECTIVES?

In addition to economic sustainability (income) effects, VSS certificates are also designed to improve environmental, labor, and social environments (Raynolds et al. 2007; Potts et al. 2014; Arnould et al. 2009; Dragusanu et al. 2014). We look at the extent to which these objectives are achieved by using data from the farm survey. To understand the incentives for sales to a cooperative, farmers were requested to provide details on the reasons for selling to a specific buyer for each coffee sales transaction that each farmer made. Farmers who sold to cooperatives stated that being a member of the cooperative was the major reason for their choice, and not the price offered (Table 7.1). We also enquired about what these farmers saw as the benefits of having access to cooperatives in the community, dividing the results based on certified and non-certified ones (Table 7.1). The results indicate that most farmers do not believe that cooperatives offer higher prices, but they state that there are other advantages linked to advice and location, as well as payments of dividends. No significant difference is noted between certified and non-certified cooperatives.

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[13] See http://www.oromiacoffeeunion.org/

Table 7.1—Stated benefits by farmers of accessing certified and non-certified cooperatives

	Unit	Observa-tions	Non-coopera-tives	Non-certi-fied coopera-tives	Certified coopera-tives	All
Major reasons why farmer chose this buyer in 2013 red cherries' sales transaction:						
"Gives higher price"	% yes	282	22.3	42.9	11.6	19.5
"Accepts large quantities"	% yes	5	0.4	0.0	0.4	0.4
"Accepts small quantities"	% yes	30	3.3	0.0	0.6	2.1
"Gives advances when needed or lends money"	% yes	32	3.7	0.0	0.4	2.2
"Pays immediately"	% yes	104	12.2	1.2	0.7	7.2
"Is close by"	% yes	228	25.5	11.9	1.8	15.7
"No real difference with other buyers"	% yes	185	22.1	2.4	0.6	12.8
"Only a single buyer"	% yes	12	1.4	0.0	0.2	0.8
"Trust his weighing"	% yes	23	2.0	4.8	0.6	1.6
"Buyer is a relative"	% yes	20	2.5	0.0	0.0	1.4
"Buys at the farm gate"	% yes	25	3.1	0.0	0.0	1.7
"Buyer has the needed inputs"	% yes	1	0.1	0.0	0.0	0.1
"Because of advantages of being a member"	% yes	498	1.2	35.7	83.3	34.4
"Other"	% yes	4	0.4	1.2	0.0	0.3
Total	% yes	1449	100.0	100.0	100.0	100.0
For those having option to sell to cooperatives, main advantages of selling to a cooperative:						
"Provide higher prices"	% yes	627		49.5	52.1	50.9
"Provide credit"	% yes	623		25.8	14.4	19.6
"Provide advice"	% yes	626		44.8	60.9	53.5
"Provide inputs"	% yes	627		41.5	10.6	24.7
"Pay immediately"	% yes	626		58.0	22.4	38.7
"Are close by"	% yes	627		55.1	58.5	56.9
"Do not cheat with weights"	% yes	619		67.7	55.6	61.1
"Pay dividends or second payments later"	% yes	617		42.2	80.3	63.2

Source: Authors' calculations based on ESSP's coffee producer survey 2014
Note: Robust standard errors; t-values in bold are significant at the 5 percent level.

We rely on regressions and matching techniques to assess the influence of certification on indicators other than on prices. To first understand some of the characteristics associated with the type of farmers who participate in selling certified coffee, we run a probit of certified versus non-certified farmers (Table 7.2). We include on the right-hand side of the regression measures of household characteristics (size of household, gender of the head of household, education levels), farm characteristics (land owned, coffee land cultivated), and distance to facilities. The results show that VSS-certified households are located closer to paved roads and closer to coffee cooperatives. They also show that the heads of VSS-certified households are older and more likely to have been in school.

Table 7.2—Determinants of participation in certification schemes

	Unit	Coef.	z-value
Gender of head of household	male=1	-0.203	-0.96
Age of head of household	log(years)	0.786	**4.58**
Coffee land cultivated	log (ha)	0.096	0.66
Non-coffee land size owned	log (ha)	-1.389	**-7.45**
Household size	log(number)	0.017	0.13
Dependency ratio	share	-0.049	-0.84
Head of household completed primary school	yes=1	0.006	0.04
Head of household did not go to school	yes=1	-0.684	**-4.10**
Travel time to all-weather road	log(minutes)	-0.048	-1.24
Value of household assets	log(Birr)	-0.009	-0.24
Value of livestock owned	log(Birr)	0.007	0.44
Travel time to cooperative that buys coffee	log(minutes)	-0.384	**-6.27**
Travel time to cooperative that distributes inputs	log(minutes)	0.299	**4.40**
Constant		-2.685	**-3.63**
Number of observations		1,118	
R-squared		0.14	

Source: Authors' calculations based on ESSP's coffee producer survey 2014

Note: Robust standard errors; z-values in bold are significant at the 5 percent level.

We then attempt to understand the impact of certification on a number of stated outcome variables of VSS, including adoption of better technologies, organic indicators, labor standards, and access to social services. We rely on two methods to assess impact of certification, i.e. simple OLS or probit estimates (where we compare certified and non-certified cooperatives with an F-test) as well as a matching methodology, using the probit model that is presented in Table 7.2 to calculate propensity scores (see Appendix).

First, we look at how certified farms implement improved production technologies more effectively, receive more visits from extension agents, and achieve higher yields. The results indicate that certified farmers have higher adoption rates of improved technologies (especially stumping and compost use, which are significantly higher in both specifications[14]), but we also find that certified farmers do not have better access to extension agents or have higher yields (Table 7.3).

The second series of indicators look at the use of chemical fertilizer, pesticides, and herbicides. The use of these chemicals for coffee production is extremely small in Ethiopia and most coffee production is organic, even though farmers may not actually be organic-certified. We see that only 6 percent and 2 percent of the coffee farmers use chemical fertilizers and other agro-chemicals, respectively. The low level of use of inorganic chemicals might therefore explain why - except for the matching exercise for chemical fertilizer use - we do not find any significant results of the impact of certification on the use of these chemical inputs in any of the regressions or the matching exercises that were conducted.

Third, farmers were asked to indicate details on the extent that children (defined as those who were younger than 16 years of age) participated in different coffee production activities. Questions were asked on the use of child wage labor as well. A low 1.5 percent of households reported using child wage labor in coffee production activities, with no significant difference between certified and non-certified households. 30 percent of the coffee farms in our sample reported using children in coffee production activities, with child labor as a share of total labor time in the coffee production process being 6 percent. We find no significant impact of VSS certification on the likelihood of using children in any of the two specifications (Table 7.2). On the other hand, we find that the share of children in total labor is lower on certified coffee farms in both matching exercises.

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[14] Although compost use is only significant at the 10% level in the OLS specification.

Table 7.3—Impact of selling to VSS-certified cooperatives on selected indicators of VSS objectives

Dependent variable		Coffee production					Organic practices		Labor by children		School-ing
		Yield	Exten-sion visits	Uses compost	Adopts mulch-ing	Adopts stump-ing	Uses chemical fertilizer	Uses pesti-cides or herbi-cides	Uses child la-bor on coffee farm	Child la-bor as share of all labor on farm	School-age chil-dren in school
	Unit	Quintal per ha	yes=1	yes=1	yes=1	yes=1	yes=1	yes=1	yes=1	share	share
Average		7.44	0.48	0.24	0.52	0.23	0.06	0.02	0.30	0.06	0.65
Standard deviation		5.48								0.13	0.34
OLS/Probit regressions											
Households sells to certified cooperative	Coeff.	0.075	0.015	0.169	0.016	0.123	0.006	0.012	-0.006	-0.012	0.121
	t-value	0.19	0.27	**3.24**	0.35	**2.48**	0.74	0.67	-0.12	-0.87	**3.48**
Households sells to non-certified cooperative	Coeff.	1.128	0.104	0.052	0.027	-0.070	0.016	-0.021	-0.041	-0.011	0.102
	t-value	1.66	1.75	1.09	0.52	-1.58	0.65	**-3.05**	-0.77	-0.79	**3.07**
Household characteristics included		yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Woreda dummy variables included		yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Constant	Coeff.	6.635	0.0511	0.145	0.301	-0.512	0.109	0.064	-0.700	-0.181	-1.036
	t-value	**2.95**	0.23	0.89	1.51	**-2.82**	1.51	0.88	**-3.76**	**-3.08**	**-5.69**
Observations		1,410	1,429	1,429	1,429	1,429	1,429	1,429	1,429	1,419	1,238
R-squared		0.28	0.16	0.35	0.32	0.14	0.33	0.03	0.16	0.16	0.30
F-test if certified cooperatives are different from non-certified ones											
F-value		1.99	1.31	3.02	0.03	9.16	0.16	2.38	0.23	0.00	0.18
Prob>F		0.16	0.25	0.08	0.86	**0.00**	0.69	0.12	0.63	0.98	0.67
Matching											
Nearest neighbor matching	Coeff.	0.417	0.052	0.392	0.356	0.207	-0.049	-0.007	-0.056	-0.025	0.075
	t-value	0.83	1.10	**8.63**	**8.01**	**4.53**	**-2.78**	-0.62	-1.25	**-2.23**	**2.08**
Kernel matching	Coeff.	0.313	0.050	0.392	0.329	0.209	-0.042	-0.001	-0.039	-0.019	0.073
	t-value	0.76	1.22	**9.81**	**9.77**	**5.77**	**-3.63**	-0.19	-1.10	**-2.13**	**2.80**
Observations		1,100	1,118	1,118	1,118	1,118	1,118	1,118	1,118	1,109	954

Source: Authors' calculations based on ESSP's coffee producer survey 2014

Note: Robust standard errors; z-values in bold are significant at the 5 percent level.

Fourth, as a number of the VSS certified cooperatives reported investments that were used towards better social services, including more and better school infrastructure, we test to what extent school attendance of school-aged children is impacted by VSS certification. We find that VSS-certified households are characterized by significantly higher school attendance rates as shown by statistically significant results in the matching specification (Table 7.3). While school attendance is higher for households that sell to VSS-certified than for households that sell to non-certified cooperatives, in the OLS specification this difference is not statistically significant. Overall, schooling attendance rates are higher in this specification for anybody who sells to coffee cooperatives.

8. CONCLUSIONS

VSS are rapidly taking off in global value chains. However, it is not well understood to what extent benefits of these VSS are transmitted to producing countries. In this paper, we look in particular at the impact of VSS certification on the coffee sector in Ethiopia using unique large-scale datasets. We find that adoption of VSS certification in Ethiopia is low – it currently only represents 5 percent of coffee exported and this figure has not grown significantly over the last 8 years. We further find that there are statistically significant quality premiums at the export level for VSS certified coffee in Ethiopia. VSS certification has contributed to extra foreign earnings for the country. It is estimated that average annual export earnings were 2 million USD higher per year because of VSS certification. Given the potential for growth locally and considering increasing international demand, more could be done. For example, achieving a level of 25 percent certified coffee would assure extra foreign earnings annually for Ethiopia of 10 million USD – important considerations for a country in need of foreign exchange to fund its ambitious development agenda.

However, while there are significant quality premiums attached to VSS certification at the export level, we find that only one-third of the quality premium at the export level is directly transmitted to producers. Part of the quality premium for producers is used for financing communal investments. While these are shown in our study to have led to higher school enrolment rates and while certified farmers show higher levels of adoption of improved production practices, however, there is limited evidence of large-scale impacts due to these communal investments. A much larger part of the premiums is used for overheads and program management. This is an important finding as Fairtrade, which, with Organic certification, was the focus of our study, is characterized by the highest premiums among VSS schemes (Potts et al. 2014). It can be assumed that even lower benefits from other VSS certification schemes trickle down to producers.

The challenge of these types of VSS certification schemes is to ensure greater transmission of the willingness-to-pay by consumers into higher benefits for the smallholder producers. For example, there are substantial costs to obtaining VSS certification. As stated in the requirements, minimum wages have to be paid, child wage labor is not allowed, and environmental standards (such as access to sanitation and water) have to be respected. Each of these may lead to higher production costs.[15] Moreover, sound bookkeeping and management is required from democratically elected leaders. As education levels in these production areas are generally low (in our dataset, 39 percent of the heads of households did not go to school at all), this is often a challenge for these coffee producing communities. As there are these important compliance costs with VSS certification and as benefits are relatively small, this often reduces rates of returns to adhering to VSS certification for these coffee farmers.

The limited effects on improved incomes combined with significant implementation costs might therefore not give the required incentives for rapid expansion of the adoption of VSS standards in these settings. This possibly explains the slow growth of adoption in VSS certification in the case of Ethiopia. While there is slow growth in Fairtrade and Organic certification in the country, the uptake of other VSS schemes has been even slower. This might be explained by the local market set-up, i.e. the Ethiopian Commodity Exchange (ECX), as well as the

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[15] It is also sometimes argued that Ethiopia might forego production because of its adherence to organic practices. However, even when no certification is present, few farmers use chemical fertilizer, indicating that foregone production because of adherence to organic practices is likely to be small.

smallholder nature of coffee production in Ethiopia. As Fairtrade almost exclusively deals with cooperatives and they are not required to use the ECX as a trading platform, this VSS is not affected by that requirement. However, others do not require working with cooperatives. Given that the ECX market set-up requires anonymity of the sellers, the ECX is not conducive for trade in other VSS-certified coffee beans. However, given the prohibitive high costs of certification for smallholders, the majority of coffee farmers – except the commercial farms – are unlikely to show interest. Moreover, as different certification schemes fetch different retail margins, they are likely to have, not only different wholesale prices, but different price spreads between wholesale and retail. Therefore, studying the effects of other VSS certificate schemes should be a fruitful area for future research.

The low transmission of the premium of VSS models to effectively benefit poor producers is a concern, especially as other development programs illustrate greater efficiency in transmitting benefits of programs to-wards poverty alleviation.[16] Although some payment towards VSS ends up in the producing countries, the find-ings however raise questions on the efficiency of the VSS model. As it currently stands, significant resources are required for VSS certification of complete product value chains to assure the transfer of the willingness-to-pay from consumers towards sustainability and poverty alleviation.[17] Moreover, while the increasingly stringent private international standards on quality and food safety have been shown to meet their objective, and even to benefit farmers (e.g. Swinnen 2007), this is seemingly easier because of the focused objective that is easy to recognize by buyers. VSS objectives on the other hand might not be that easily attainable given the broad objective of 'sus-tainability' and substitution possibilities in the farm household economy. For example, farmers often have diverse crop portfolios. They may be able to use sustainable production practices on their coffee plots but not on their other crops. Moreover, resources can be re-allocated within the farm from coffee to other crops, e.g. no child la-bor on coffee plots might mean more child labor on other plots. While coffee might have been sustainably pro-duced and certified, it is possible that little might have changed in the aggregate at the farm, village or country level. This drawback is a crucial challenge for the successful future of such VSS-certification programs.

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[16] For example, in the case of the Productive Safety Net Program (PSNP), one of the biggest aid programs in Ethiopia, it was estimated that beneficiaries received 80 percent of the program funds (White and Ellis 2012)

[17] It could be argued that they might even exclude those farmers that it intends to benefit because of high compliance costs, as seen in the low adoption of VSS certification in smallholder coffee production in Africa (Potts et al. 2014).

REFERENCES

Arnould, E.J., A. Plastina, and D. Ball. 2009. Does Fairtrade Deliver on Its Core Value Proposition? Effects on In-come, Educational Attainment, and Health in Three Countries. *Journal of Public Policy and Marketing* 28(2): 186–201.

Bacon, C. 2005. Confronting the Coffee Crisis: Can Fairtrade, Organic, and Specialty Coffee Reduce Small-Scale Farmer Vulnerability in Northern Nicaragua? *World Development* 33(3): 497–511.

Barham, B. L. and J. G. Weber. 2012. The Economic Sustainability of Certified Coffee: Recent Evidence from Mexico and Peru. *World Development* 40(6): 1269-1279.

Beuchelt, T. D. and M. Zeller. 2011. Profits and Poverty: Certification's Troubled Link for Nicaragua's Organic and Fairtrade Coffee Producers. *Ecological Economics* 70(7): 1316-1324.

Binswanger-Mkhize, H., J.P. de Regt, and S. Spector. 2009. *Scaling up Local and Community Driven Development: A Real World Guide to its Theory and Practice.* World Bank, Washington DC.

Chiputwa, B., D.J. Spielman, and M. Qaim. 2105. Food Standards, Certification, and Poverty among Coffee Farmers in Uganda. *World Development* 66: 400-412.

Cramer, C., D. Johnston, C. Oya, and J. Sender. 2014. *Fairtrade, Employment and Poverty Reduction in Ethiopia and Uganda.* Report submitted to the Department for International Development (DfID), government of the United Kingdom. Fairtrade, Employment and Poverty Reduction in Ethiopia and Uganda (FTEPR) research project. London: SOAS, University of London.

CTA (Technical Centre for Agricultural and Rural Cooperation (ACP-EU)). 2013. *Executive brief: Coffee Sector*. Wageningen, The Netherlands: Agritrade. (http://agritrade.cta.int/Agriculture/Commodities/Coffee/Executive-Brief-Update-2013-Coffee-sector, accessed 16 December 2014).

de Janvry, A., C. McIntosh, and E. Sadoulet. 2014. *Fairtrade and Free Entry: Can a Disequilibrium Market Serve as a Development Tool?* Mimeo. (http://irps.ucsd.edu/assets/001/505311.pdf, accessed 16 December 2014).

Dragusanu, R., and N. Nunn. 2014. *The Impacts of Fairtrade Certification : Evidence From Coffee Producers in Costa Rica.* , Mimeo. (http://scholar.harvard.edu/files/nunn/files/draft_august_2013.pdf, accessed 16 December 2014).

Dragusanu, R., D. Giovannucci, D. Nunn. 2014. The Economics of Fairtrade. *Journal of Economic Perspectives* 28 (5): 217-236.

Elder, S.D., H. Zerriffi, and P. Le Billon. 2012. Effects of Fairtrade Certification on Social Capital: The Case of Rwandan Coffee Producers. *World Development* 40 (11): 2355–2367.

Giovannucci, D., and S. Ponte. 2005. Standards as a New Form of Social Contract? Sustainability Initiatives in the Coffee Industry. *Food Policy* 30 (3): 284–301.

Giovannucci, D., O. von Hagen, and J. Wozniak. 2014. Corporate Social Responsibility and the Role of Voluntary Sustainability Standards, in C. Schmitz-Hofman et al., eds. *Voluntary Sustainability Standards, Natural Resource Management in Transition 1*, Berlin and Heidelberg: Springer-Verlag.

Haight, C. 2011. The Problem with Fairtrade Coffee. Stanford Social Innovation Review. Summer 2011 edition. (http://www.ssireview.org/articles/entry/the_problem_with_fair_trade_coffee, accessed 16 December 2014).

Henson, S., and T. Reardon. 2005. Private Agri-Food Standards: Implications for Food Policy and the Agri-Food System. *Food Policy* 30: 241-253.

Hoebink, P., R. Ruben, W. Elbers, and B. Van Rijsbergen. 2014. *The Impact of Coffee Certification on Smallholder Farmers in Kenya, Uganda and Ethiopia.* Report prepared by Centre for International Development Issues Nijmegen (CIDIN). Nijmegen, The Netherlands: Radboud University.

ITC (International Trade Centre). 2011. *The Coffee Exporters Guide.* Geneva: ITC.

Jena, P.R., B.B. Chichaibelu, T. Stellmacher, and U. Grote. 2012. The Impact of Coffee Certification on Small-scale Producers' Livelihoods: A Case Study from the Jimma Zone, Ethiopia. *Agricultural Economics* 43 (4): 429-440.

Kersting, S., and M. Wollni. 2012. New Institutional Arrangements and Standard Adoption: Evidence from Small-scale Fruit and Vegetable Farmers in Thailand. *Food Policy* 37 (4): 452-462.

Kodama, Y. 2009. The Effects of Fairtrade on Coffee Producers : A Case Study of Ethiopian Coffee Cooperatives. *16th International Conference of Ethiopian Studies*. 297–299.

Lancaster, K. 1966. New Approach to Consumer Theory. *Journal of Political Economy* 74 (2): 132-157.

Panhuysen, S., and J. Pierrot. 2014. *Coffee Barometer 2014*. The Hague, The Netherlands: HIVOS.

Pierrot, J., D. Giovannucci, and A. Kasterine. 2011. *Trends in the Trade of Certified Coffee.* Geneva: International Trade Center.

Potts, J., M. Lynch, A. Wilkings, G. Huppé, M. Cunningham, and V. Voora, 2014. *The State of Sustainability Initiatives Review 2014.* London: International Institute for Sustainable Development and the International Institute for Environment and Development.

Raynolds, L., D. Murray, and A. Heller. 2007. Regulating Sustainability in the Coffee Sector: A Comparative Analysis of Third-party Environmental and Social Certification Initiatives. *Agriculture and Human Values* 24 (2): 147-163.

Reardon, T., C. B. Barrett, J. Berdegué, and J. Swinnen. 2009. Agrifood Industry Transformation and Small Farmers in Developing Countries. *World Development* 37 (11): 1717–1727.

Ruben, R., and R. Fort. 2012. The Impact of Fairtrade Certification for Coffee Farmers in Peru. *World Development* 40 (3): 570-582.

Rueda, X., and E.F. Lambin. 2012. Linking Globalization to Local Land Uses: How Eco-consumers and Gourmands are Changing the Colombian Coffee Landscapes. *World Development* 41: 286-301

Rueda, X., and E.F. Lambin. 2013. Responding to Globalization: Impacts of Certification on Colombian Small-scale Coffee Growers. *Ecology and Society* 18 (3): 21.

Stellmacher, T., and U. Grote. 2011. *Forest Coffee Certification in Ethiopia: Economic Boon or Ecological Bane?*. Working Paper Series 76, Centrum for Development Research, University of Bonn

Swinnen, J., ed. 2007. *Global supply chains, standards and the poor: How the globalization of food systems and standards affects rural development and poverty.* Wallingford, UK: CAB International.

Valkila, J., and A. Nygren. 2009. Impacts of Fairtrade Certification on Coffee Farmers, Cooperatives, and Laborers in Nicaragua. *Agriculture and Human Values* 27 (3): 321-333.

Wang, H., X. Dong, S. Rozelle, J. Huang, T. Reardon. 2009. Producing and Procuring Horticulture Crops with Chinese Characteristics: The Case of Northern China. *World Development* 37 (11): 1791-1801.

Weber, J. G. 2011. How Much More do Growers Receive for Fairtrade-Organic Coffee? *Food Policy* 36 (5): 678-685.

Wollni, M., and M. Zeller. 2007. Do Farmers Benefit from Participating in Specialty Markets and Cooperatives? The Case of Coffee Marketing in Costa Rica. *Agricultural Economics* 37 (2): 243-248.

APPENDIX

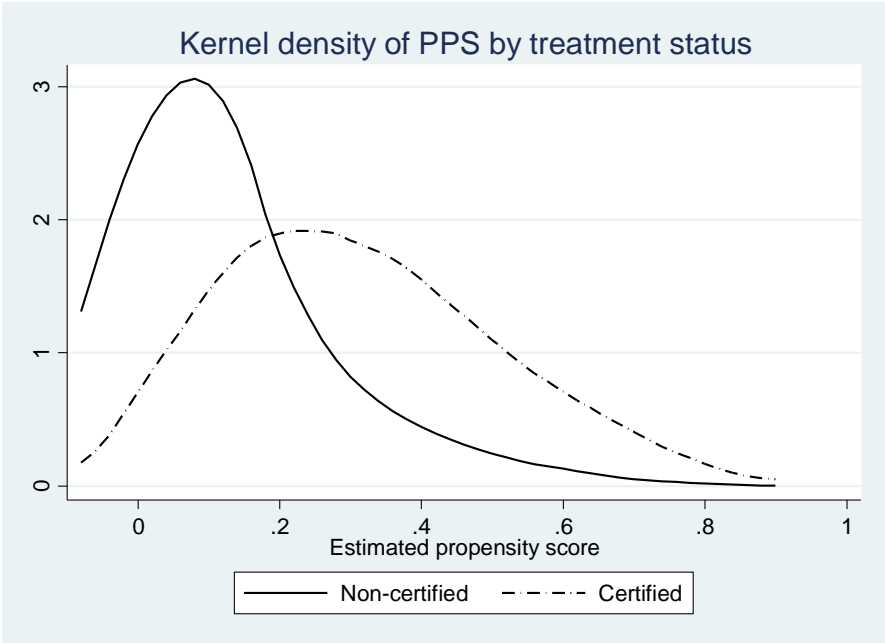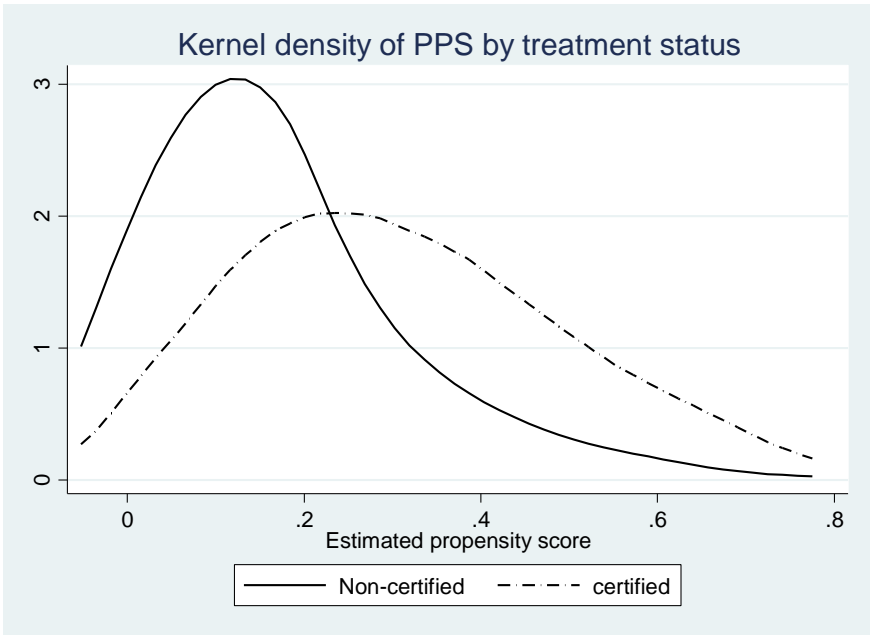**Figure A1—Distribution of propensity score (PPS) before matching**

Kernel density of PPS by treatment status

Figure A2—Distribution of propensity score (PPS) after matching

Kernel density of PPS by treatment status

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The Ethiopia Strategy Support Program is an initiative to strengthen evidence-based policymaking in Ethiopia in the areas of rural and agricultural development. Facilitated by the International Food Policy Research Institute (IFPRI), ESSP works closely with the government of Ethiopia, the Ethiopian Development Research Institute (EDRI), and other development partners to provide information relevant for the design and implementation of Ethiopia's agricultural and rural development strategies. For more information, see http://www.ifpri.org/book-757/ourwork/program/ethiopia-strategy-support-program or http://essp.ifpri.info/ or http://www.edri-eth.org/.

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