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Who benefits from the rapidly increasing Voluntary Sustainability Standards? Evidence from Fairtrade and Organic 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 however not well understood how effective these incentives are transmitted to producing countries. We study VSS in Ethiopia's coffee sector, its 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 with low average production levels from coffee farmers in these settings, these premiums would only lead to an increased income of 20 USD per year even with a perfect transmission scenario, and would therefore have little effect on the livelihoods of an average coffee farmer.



1. INTRODUCTION

There is a growing emphasis of international markets on VSS practices, seemingly 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, ethical standards of 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 as well as putting documentation in place to monitor the process. This documenting process might be costly to impose in situations devoid of any such practices. The certifying organization's charges can also be substantial (de Janvry et al., 2014). Therefore 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% 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;

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>

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 these VSS than in the rest of the world (CTA, 2013).

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 More in particular, we examine at how the benefits of VSS - in particular Fairtrade/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. Second, we use exceptionally rich datasets, i.e. census data of coffee transactions over a nine-year period, coffee producer prices over an eight-year period, and a comprehensive representative survey of 1,600 coffee producers. The latter survey alone is much more extensive than any other survey conducted on which most other studies have been based. 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, yet there are only small price premiums at the producer level, i.e. one-third of the quality premium for exports. The gap in effective transmission is seemingly explained by significant overhead and certification costs, and investments in communal services that might not directly improve individual producer prices. Compliance costs at the cooperative and household level are often also found to be high. Moreover, we find that even if the transmission of premiums were more efficient, it would likely lead to little effects on the livelihood 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 red cherries as VSS certified, he would increase his annual income by 144 Birr or 7.5 US dollar with the current transmission rates. Even in the case of a perfect transmission, an average farmer would only increase his annual income by 20 US dollar. These premiums from

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

VSS certification are therefore likely to contribute little to improving the livelihoods of coffee producers. These findings, 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 and with concluding remarks.

2. VOLUNTARY SUSTAINABILITY STANDARDS (VSS) IN COFFEE

Concerns for producers' income combined with those for social injustice and environmental destruction have led to the start of 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 hardship for many poor smallholder coffee producing households. In 2005, it was estimated that 4% 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% of global trade (Giovannucci et al., 2014). The main sustainability standards in the coffee sector include Fairtrade, Organic, Rainforest Alliance, Utz Capeh, 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 get sufficient incomes by assuring minimum prices and price premiums and by guaranteeing social standards. A second VSS, i.e. Organic, certification should ensure that a product has been produced under organic standards. It emphasizes systems that promote and enhance agro-ecosystem health, including biodiversity, biological cycles, and soil biological activity. To obtain Organic certificates, it is required that no inorganic outputs have been used on the farm for two years prior to



obtaining the crop of coffee. There is often double certification where Fairtrade and Organic certifications have been combined: Pierrot et al. (2011) estimate that this combination made up 42% of global Fairtrade. Notably, these two VSS were the first to be implemented globally.⁴

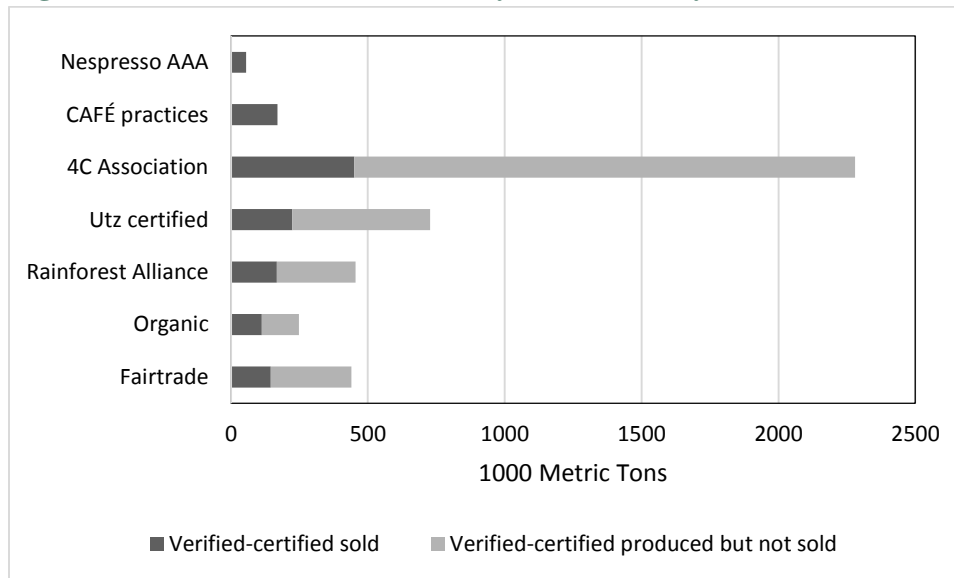
A number of other, more recently developed certification schemes are now important globally, but less so in Ethiopia. *Utz capeh* certification promotes better business practices and focuses on a tracking system to ensure that coffee producers implement good agronomic practices which the industry then rewards (Potts et al., 2014). More in particular, it incorporates Global Gap practices, and social and environmental criteria. Rainforest Alliance certification aims to ensure sustainable livelihoods by transforming land-use and business practices and consumer behavior (Potts et al., 2014). Independent certification is required for these four major VSS, i.e. Fairtrade (by FLO), Organic (by IFOAM), Rainforest Alliance (by RA) and *Utz Capeh* certified (by UTZ). The 4C (“Common Code for Coffee Community”) Association aims to establish a code of conduct for global coffee trade. In contrast with other VSS, this initiative relies on self-assessment and a three-year verification cycle (Panhuysen and Pierrot, 2014). Two other VSS initiatives belong specifically to private companies who have their own standards. CAFÉ practices 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 VSS 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 Capeh* Certified are growing much faster than Organic or Fairtrade as the former provide arguably 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%

⁴ It is to be noted that Fairtrade certification could initially only be granted to groups of smallholders organized in producer organizations. While this was the initial condition, this is no longer true for all product types and Fairtrade can now be achieved by both small producer organizations and hired labor organizations.

of the global coffee production was produced under one of these VSS but only 15% was actually sold using such labels (Panhuysen and Pierrot, 2014).

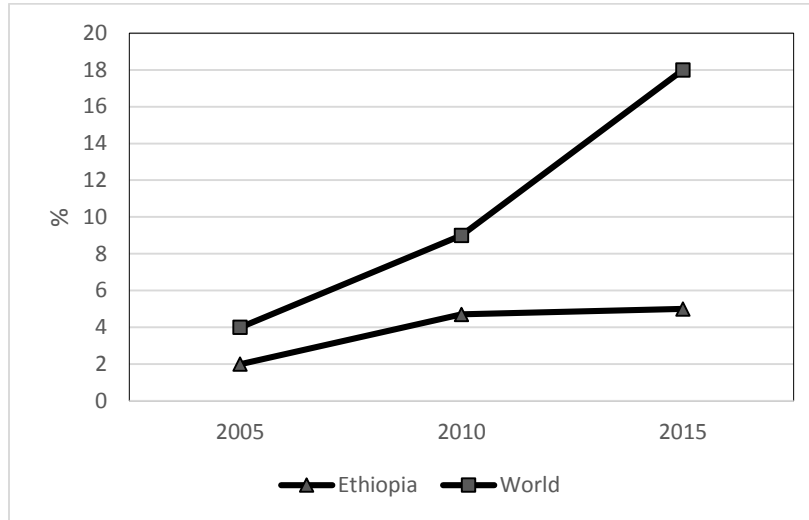
Figure 2.1—Prevalence of Voluntary Sustainability Standards in the coffee sector (2013)



Source: Panhuysen and Pierrot (2014)

VSS certification of coffee is a relatively new phenomenon in Ethiopia. At the turn of the last decade only one certifier in the whole country was accredited to issue these certificates. Since 2006, the country has however 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 in 2013, a total of 111 cooperatives were certified to export their coffee under Fairtrade. Organic certification is also widely implemented by these cooperatives. 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% in 2005, compared to 5% in 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. It has to be noted upfront that in all datasets, there is significant overlap of certifications, especially of Fairtrade and Organic certification, and we are therefore 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 most coffee in the country. The zones were stratified based on the coffee variety produced, which is classified for export markets (Sidama, Jimma, Nekempte, Harar, Yirgacheffe). Within each strata, woredas were ranked from the highest to the lowest producer. Woredas were divided in two, the less productive woredas and the more productive ones (defined by each one cultivating 50% of the area). Two woredas were randomly selected from each group, and then a list of all the kebeles from the selected woredas was obtained. Two kebeles were randomly chosen from two categories, i.e. the top and the bottom 50% producing kebeles. Finally, a list of all households in the selected kebeles was made. They were ranked from small to large coffee producers (based on areas cultivated in the year before the survey). We divided the producers into two groups, the less productive and the more productive ones (defined by each one culti-

vating 50% of the area). A total of 20 coffee producers was then selected: 10 from the less productive and 10 from the highly productive ones. In total, 16 kebeles were included in the survey and 20 coffee producers from these selected kebeles. Thus, 320 producers were interviewed per stratum.

Second, we collected 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 3 top producing woredas were selected and all primary cooperatives were there visited. For each cooperative sampled, we attempted to find out if they had kept records over the last 9 years and in what form these records were, i.e. receipts or a “record book”. In the case where a transactions record book was maintained containing data on transaction prices, quantities, and total amounts paid out, we photocopied the book in the nearest town and those data were subsequently entered electronically in the computer. Using this survey method, we were able to collect price information of 89 cooperatives, as well as 138 private traders. Moreover, a survey of cooperative unions was conducted in July 2014, during which time information was recorded about all certification types, the number of certified cooperatives, 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 this Unit and it 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 We also obtained a list

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 for 40 percent to the final quality grade, while the cup inspection contributes for 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, including cup cleanliness, acidity, body, and flavor. Each characteristic counts for 15 percent of the 60 percent of 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 determine the (sometimes very high)

of private commercial coffee farms (with cultivated areas of 40 hectares and above) from its association. This information was integrated into the dataset as well.

4. CONCEPTUAL FRAMEWORK AND EMPIRICAL METHODOLOGY

To motivate our empirical analysis, we follow the theoretical model developed by Lancaster (1966) and we consider a food product (or a group of food products) as a collection of characteristics or attributes. In particular, a food product i can be described by a vector of attributes $x_i = \{x_i^0, x_i^1, \dots, x_i^N\}$ 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: $U = U(x^0, x^1, \dots, x^N)$ 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:

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

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

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:

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

$$\text{subject to: } G(x^0, \dots, x^N; l_1, \dots, l_M) \leq 0$$

which yields first order conditions of the form:

prices paid but are not recorded in our dataset. However, the number of such purchases should be too low to influence the results found.

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

$$\frac{\partial U}{\partial x^k} - \lambda \frac{\partial G}{\partial x^k} = 0$$

$$-p_n - \lambda \frac{\partial G}{\partial l_n} = 0$$

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:

$$\frac{dp}{dx^k} = \frac{\partial U}{\partial x^k} = p \frac{\partial G}{\partial x^k}$$

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 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:

$$p = \sum_{k=0}^N \beta_k X^k + v$$

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

$$p_{jt}^m = \beta_0 + \beta_1 * VSS_{jt}^m + \sum_i \beta_2 * X_{ijt}^m + \sum_j \beta_3 * \alpha_j^m + \sum_t \beta_4 * \eta_t^m + v_{jt}$$

Where p_{jt}^m 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. The α_j are buyer fixed effects and 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 buyer. The assumptions for this specification to be valid is common trends among VSS and non-VSS buyers as well as conditional independence between the price outcome variable and the VSS variable. This type of regression is run at two levels in the value chain, the exporter as well as the primary cooperative level. 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 until 2013. Despite large variability between years, coffee exports have been increasing over the period considered, from 156,000 tons in 2007 to 172,000 tons in 2013. Coffee exports are mostly in the hands of the private sector and while the share of cooperatives in exports is increasing, it is still minor: they made up 6% of total exports in 2013, increasing from 5% in 2007. The share of VSS certified coffee in total exports is relatively small. It varied from a low of 3.1% in 2008 to a high of 5.3% in 2011 over the period considered. Most of the VSS certified coffee is exported by cooperatives and the majority of coffee that is exported by them is VSS certified: in the last 3 years, VSS certified coffee varied between 72% and 75% 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% in 2013.

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

year	Quantity coffee exports			Certified coffee			
	Total tons	By coopera- tives tons	Share cooperatives %	Total in tons	Share (%) of total exports	By cooperatives % of coop.'s exports tons	By non- cooperatives tons
2007	156,157	7,541	4.8	6,352	4.1	5,708	644
2008	170,433	7,242	4.2	5,210	3.1	4,011	1,199
2009	111,035	7,690	6.9	4,541	4.1	4,277	264
2010	199,478	10,703	5.4	9,438	4.7	8,922	516
2011	160,523	10,302	6.4	8,475	5.3	7,552	923
2012	192,150	11,073	5.8	9,494	4.9	8,351	1,143
2013	172,247	10,460	6.1	8,482	4.9	7,487	995

Table 5.2 gives an overview of the different types of VSS certification that cooperatives adhere to.⁸ About one-third of the primary coffee cooperatives - that are subsequently organized in cooperative unions - in Ethiopia have VSS certification. Organic certification is the dominant one, with 136 primary cooperatives accredited for it. They are spatially clustered as about half of the Organic certified cooperatives are from the Sidama and Yirgachefe cooperative unions. 29% of all the coffee primary cooperatives are organically certified. The next most important VSS certification in Ethiopia is Fairtrade. There are 128 primary cooperatives that are accredited by FLO. The Oromia and Sidama cooperative unions have the largest number of FLO certified cooperatives. They jointly account for about two-third of FLO certified cooperatives in the country. The other two types of certificates prevalent in Ethiopia, i.e. Rainforest Alliance and Utz Capeh, are not widely adopted yet. Out of all the cooperatives, just 2% of cooperatives are certified with one or the other.

Double certification of Fairtrade and Organic is common in Ethiopia 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 for Utz capeh or Rainforest alliance 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 than for Yirgacheffe and Sidama, possibly due to poorer administration capacity at the primary cooperative levels and poorer quality coffee.

⁸ This information was obtained from the cooperative unions.

Table 5.2—Number of VSS certified primary cooperatives

Cooperative unions	Number of primary cooperatives	Number of certified primary cooperatives				
		Type of VSS				
		Any VSS Certifi- cate	Organic	Fairtrade	Rainfor- est Alliance	Utz Capeh
Sidama	47	42	39	41	3	5
Yirgacheffe	26	26	26	26	3	2
Oromia	250	41	24	41	3	3
Limmu Inara Wolaita	27	16	16	5	0	0
Damota	42	10	10	0	0	0
Kaffa	34	19	18	15	0	0
Bench Maji	39	3	3	0	0	0
Total	465	157	136	128	9	10

As described earlier, one challenge for VSS certification is quality. For VSS certifications that guarantee a price floor and/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 the Sidama region 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.⁹ The coefficients of unwashed and undergraded 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).

⁹ 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 the NGO programs that support coops in a variety of ways related to quality and also help them gain certification.

Table 5.3—Associates of VSS certification at the export level

	Unit	Certification Coef.	z-value*
<i>Washed coffee (grade 2 = default)</i>			
Grade 1	yes=1	0.71	5.76
Under-graded	yes=1	-0.49	-4.15
<i>Unwashed coffee</i>			
Grade 3	yes=1	0.61	6.63
Grade 4	yes=1	-0.16	-3.06
Grade 5	yes=1	-0.89	-8.95
Under-graded	yes=1	-0.98	-3.28
<i>Type of exporter (default=private)</i>			
Cooperative	yes=1	3.31	77.96
Para-statal	yes=1	0.00	-
State farm	yes=1	0.00	-
Private commercial farm	yes=1	1.80	28.70
<i>Region of origin (default=Sidama)</i>			
Jimma	yes=1	-0.16	-1.60
Wollega/Lekempte	yes=1	-0.39	-3.61
Yirgacheffe	yes=1	-0.13	-2.75
Limu	yes=1	-0.87	-11.98
Harar	yes=1	-0.23	-2.90
Other	yes=1	-0.19	-1.60
<i>Year (default=2006)</i>			
2007	yes=1	0.03	0.26
2008	yes=1	-0.12	-0.94
2009	yes=1	-0.38	-3.09
2010	yes=1	0.04	0.34
2011	yes=1	0.08	0.69
2012	yes=1	0.14	1.16
2013	yes=1	-0.08	-0.70
2014	yes=1	-0.20	-1.63
Intercept		-2.25	-19.75
Number of observations		33,851	
Wald chi2(29)		7,935	
Prob>Chi2		0.00	
Pseudo R2		0.70	

* robust standard errors; z-values in bold are significant at the 5 percent level

We thus find that VSS certification in Ethiopia has not yet taken off in a major way. In the case that is applied, it is mostly done by cooperatives, using Fairtrade and Organic certification. Most of the coffee that is VSS certified is further high quality washed coffee. To understand to what

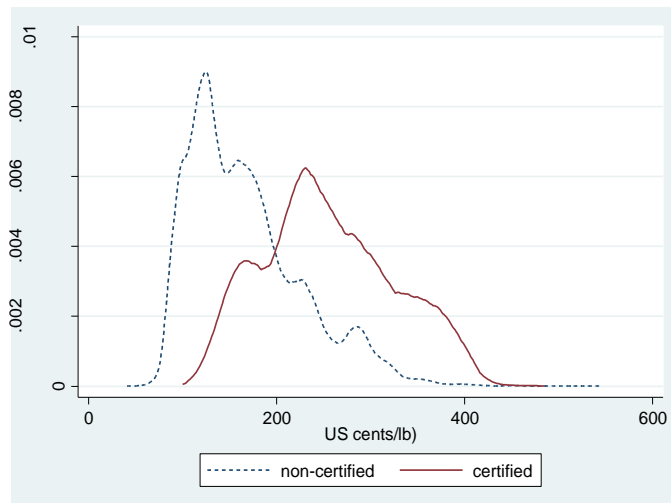
extent prices and incentives matter for VSS certification at different levels in the value chain, we look in the next section at quality premiums for VSS certification, at export and producer level.

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% 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 of the VSS certification dummy) in a specification where all exporters are included (Specification 4) or where the sample is restricted to cooperatives only (Specification 5) respectively. The evidence therefore suggests that there are statistically significant but small premiums (of about 7%) 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
<i>Washed coffee (grade 2 = default)</i>											
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
<i>Unwashed coffee</i>											
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
<i>Region of origin (default=Sidama)</i>											
Jimma	yes=1	-6.01	-6.67	-7.36	-2.50	-29.78	-5.77	-5.50	-1.21	-34.34	-6.07
Wollega/Lekempte	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
<i>Type of exporter (default=private trader)</i>											
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	

6.2. Producer level

We first present some qualitative information linked to access to cooperatives and price perceptions from the data collected in the farm survey in 2014. Table 6.2 illustrates that almost 40% of the farmers in our survey had the option to sell to cooperatives. 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. The Table 6.2 also shows that cooperatives mostly focus on the procurement of red cherries (that is later processed towards washed coffee). Farmers were further asked about the prices offered by cooperatives compared to other buyers. Some 43% of farmers believe that prices are higher while 28% and 22% think they are lower or the same respectively.

Table 6.2—Access to cooperatives and price perceptions

	Unit	Number of observations	Cooperatives Non-certified	Cooperatives Certified	All
Farmer stated that they had the option to sell to a cooperative	%	1,598	21.2	18.2	39.7
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
<i>For those having option to sell to cooperatives</i>					
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

To analyze quality premiums of VSS certification at the producer level, we use a time series of producer prices that were collected from the cooperatives and private traders over an eight-year period, from 2005 to 2012. For each cooperative, information was obtained on the exact time that VSS certification was obtained. As most of the certified buyers only 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, 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 Nekempt, 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 fixed effect 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 therefore suggests that VSS certification did not lead to higher producer prices over the period considered.

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

	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	0.94	13.80	1.56	71.34	0.13	0.48	0.09	0.33	-0.26	-0.58
<i>Type of bean (default=red cherries)</i>											
Dried cherries	yes=1	21.75	59.78								
Coffee beans	yes=1	102.02	65.88								
<i>Type of seller (default=private)</i>											
Cooperative	yes=1	-0.65	-5.38	-1.40	-31.03						
<i>Region of origin (default=Sidama)</i>											
Jimma	yes=1	-0.92	-26.51	-0.93	-41.55						
Wollega/Lekempte	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	

* robust standard errors; t-values in bold are significant at the 5 percent level

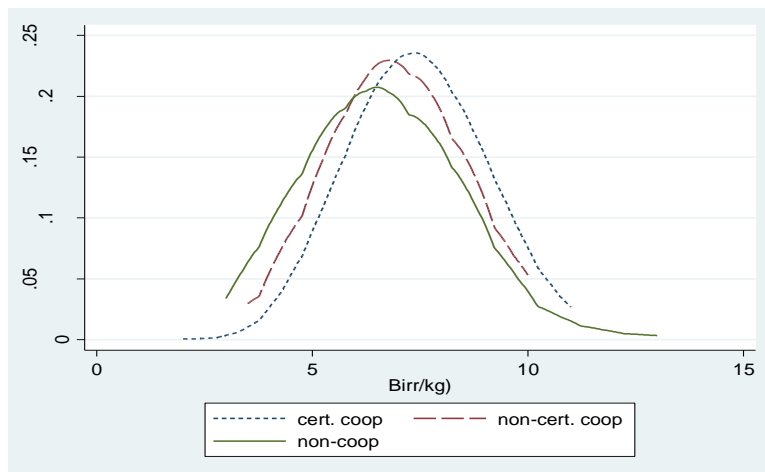
One issue with the estimation of premium transmission in the method above might be that cooperatives pay a quality premium only after they have secured a buyer for the lot and have been paid. Some cooperatives also pay dividends. Analysis of prices at the time of transactions only might therefore potentially underestimate the benefits of VSS certification. While that information 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% and 23% 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% of the farmers who sold to certified cooperatives reported to have received a second payment and 27% of them received a dividend. Overall, 66% of the farmers that sold to certified cooperatives received a 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 therefore suggest that coffee incomes received from cooperatives have increased through second payments or dividends, and more so for certified farmers. Table 6.3 further illustrates that, as perceived by farmers, prices paid by cooperatives are not systematically higher than from other buyers and also that late payments are common with cooperatives, especially so for certified ones.

Table 6.4—Cooperatives, dividends and second payments

	Unit	Number of observations	Cooperatives		All
			Non-certified	Certified	
<i>If farmer sold to cooperative:</i>					
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

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 second measure for red cherries by market outlet.¹⁰ 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.¹¹

Figure 6.2—Producer quality premiums (using combined prices of first and second payment) for VSS certification of red cherries (2013)



Source: Authors' calculations based on data from the coffee producer survey 2014

In the above graph, 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 dummies reflecting 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. As dependent variable, we use the

¹⁰ We focus on red cherries as VSS certification almost exclusively deals with these.

¹¹ 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) while 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 $\Pr(|T|>|t|)=0.21$).

price received at the time of the transaction and the measures that incorporate second payments and dividends. 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 do 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 red cherries producer level, in US cents per lb., harvest of 2013

	Unit	Price 1		Price 2		Price 3	
		First Coef. (=A)	payment t-value*	A + 2nd payment Coef. (=B)	t-value*	B + dividend Coef.	t-value*
<i>Type of buyer (default=non-cooperative)</i>							
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
<i>Quality (default=mostly green)</i>							
Mixture of red/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
<i>Place of sales (default=farmer-trader/collector in village)</i>							
To agent of private mill/hull	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/trader without a hull/mill	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

* 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) and 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).¹² Using this method, we therefore deduce a transmission of quality premiums to producers of 33%.

6.3. What explains the gap?

The evidence presented above suggests that we find a rather small transmission of quality 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 quality premium paid for VSS certification at the export level goes. A number of explanations can be forwarded.

First, the VSS are implemented by primary cooperatives, organized at the village level, which are grouped in cooperative unions at zonal and regional levels.¹³ 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% of the quality premium is withheld (in the case of Organic premiums, not for Fairtrade). The remaining 70% of the quality premiums goes to the primary cooperatives. While the 30% allows for the payment of certification costs in some of the cooperative unions, this is not the case for all cooperatives, and the 70% transmitted to primary cooperatives is required to cover for the 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% 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% (70% of 70%) of the quality premium would in this case be transmitted.¹⁴

Second, a common practice in Community-Driven Development projects (Binswanger-Mkhize et al., 2009), 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. It is usually invested in communal assets, such as medical and educational facilities, that provide benefit to

¹² Using an exchange rate of 19.2 Birr/USD at the end of 2013 when most of the sales of red cherries took place.

¹³ As seen in Table 2, there are 7 such unions in the country.

¹⁴ See <http://www.oromiacoffeunion.org/>



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 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). At the global level, 40% of global production in 2012 was estimated to have been produced in compliance with VSS standards, but only 15% of that quantity was sold under that label (Potts et al., 2014). These supplies are then sold on conventional markets. In such case, even though farmers are certified, coffee would not be sold at a higher price. However, in recent years, the majority of the coffee that was sold to the cooperative unions in Ethiopia was sold under a VSS certification.

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



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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

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

	Unit	Number of observ.	Non- coops.	Cooperatives Non-certified	Certified	All
<i>Major reasons why farmer chose this buyer in 2013 red cherries' sales transaction:</i>						
"He gives higher price"	% yes	282	22.3	42.9	11.6	19.5
"He accepts large quantities"	% yes	5	0.4	0.0	0.4	0.4
"He accepts small quantities"	% yes	30	3.3	0.0	0.6	2.1
"He gives advances when needed or lends money"	% yes	32	3.7	0.0	0.4	2.2
"He pays immediately"	% yes	104	12.2	1.2	0.7	7.2
"He is close by"	% yes	228	25.5	11.9	1.8	15.7
"There is no real difference with other buyers"	% yes	185	22.1	2.4	0.6	12.8
"There is only a single buyer"	% yes	12	1.4	0.0	0.2	0.8
"I trust his weighing"	% yes	23	2.0	4.8	0.6	1.6
"The buyer is a relative"	% yes	20	2.5	0.0	0.0	1.4
"He 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
<i>For those having option to sell to cooperatives</i>						
Main advantages of selling to a cooperative:						
"They provide higher prices"	% yes	627		49.5	52.1	50.9
"They provide credit"	% yes	623		25.8	14.4	19.6
"They provide advice"	% yes	626		44.8	60.9	53.5
"They provide inputs"	% yes	627		41.5	10.6	24.7
"They pay immediately"	% yes	626		58.0	22.4	38.7
"They are close by"	% yes	627		55.1	58.5	56.9
"They do not cheat with weights"	% yes	619		67.7	55.6	61.1
"They pay dividends/second payments later"	% yes	617		42.2	80.3	63.2

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 head of the households is older and is also 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
Distance 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
Distance to coop. that buys coffee	log(minutes)	-0.384	-6.27
Distance to coop. that distributes inputs	log(minutes)	0.299	4.40
Constant		-2.685	-3.63
Number of observations		1,118	
R-squared		0.14	

* robust standard errors; t-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 above 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 specifications¹⁵) but we also find that certified farmers do not have better access to extension agents or have higher yields (Table 7.3).

¹⁵ Although compost use is only significant at the 10% level in the OLS specification.

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 of the coffee production is organic, even though the farmers are not actually certified for Organic coffee. We see that only 6% and 2% 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 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% of the households report to use child wage labor in coffee production activities and no significant difference between certified and non-certified households was found. 30% of the coffee farms in our sample reported to use children in coffee production activities and the share of child labor in total labor time during the coffee production process is 6%. We find that there is 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.

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 significant (at the 5%) results in the matching specification (Table 7.3). While the school attendance is higher for certified than for 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.

Table 7.3—Cooperatives and VSS objectives indicators

Dependent variable	Yield (Q/ha)	Extension visits	Uses compost	Adopts mulching	Adopts stumping	Uses chem. fertilizer	Uses pesticides	Uses children on coffee farm	Uses children on coffee farm	School-age children in school	
		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	
Std. deviation	5.48				0.42				0.13	0.34	
OLS/Probit regressions											
Households sells to...											
... certified coop. (yes=1)	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
... non-cert. coop. (yes=1)	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 & woreda indicators included											
Constant	Coeff.	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
	t-value	6.635	0.0511	0.145	0.301	-0.512	0.109	0.064	-0.700	-0.181	-1.036
		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 different from non-cert. 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

* robust standard errors; z-values in bold are significant at the 5 percent level

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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% of exported quantity – and that 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 and that VSS certification has therefore 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 the increasing international demand, more could be done. For example, to achieve a level of 25% certified coffee, this would assure extra foreign earnings annually for Ethiopia to the height of 10 million USD - important considerations for a country in need of foreign exchange to fund its ambitious development agenda.

While there are significant quality premiums attached to VSS certification at the export level, we find however that only one-third of that quality premium at the export level is directly transmitted to producers. Part of the quality premiums is used towards the financing of communal investment. 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, there is however limited evidence on large-scale impacts of these communal investments given that a much larger part of the premiums has also been used for overheads and program management. This is an important finding as Fairtrade is characterized by the highest premiums among VSS certificates (Potts et al., 2014) and it can therefore be assumed that even lower benefits from other VSS certification trickles down to the actual producers.

The challenge of these types of VSS certification is therefore to ensure greater transmission of the willingness-to-pay by consumers and higher benefits to the poor 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.¹⁶ 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% 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 therefore important compliance costs with VSS certification and as benefits are relatively small, this often reduces rates of returns of adhering to VSS certification by 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 even been slower. This might be explained by the local market set-up, i.e. the Ethiopian Commodity Exchange (ECX), as well as the 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 but given that the ECX market set-up requires anonymity of the sellers, it is, until these provisions are allowed, 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. Studying the effects of other VSS certificates should therefore be a fruitful area for future research.

¹⁶ 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.

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 towards poverty alleviation.¹⁷ Although some payment towards VSS ends up in the producing countries, the findings 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.¹⁸ 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 ‘sustainability’ and substitution possibilities in the farm household economy. For example, farmers have often diverse portfolios and can therefore be sustainable on coffee plots but not on others and resources can be re-allocated within the farm from coffee to other crops, e.g. no child labor on coffee plots might mean more child labor on other plots. While coffee might have been sustainably produced and certified, it is possible that little might have changed in the aggregate at the farm, village or country level. This drawback is therefore seemingly a crucial challenge for the successful future of such programs.

¹⁷ For example, in the case of the Productive Safety Net Program (PSNP), one of the biggest aid programs in Ethiopia, it was estimated that 80% of the program funds went to beneficiaries (White and Ellis, 2012)

¹⁸ 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).

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APPENDIX

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

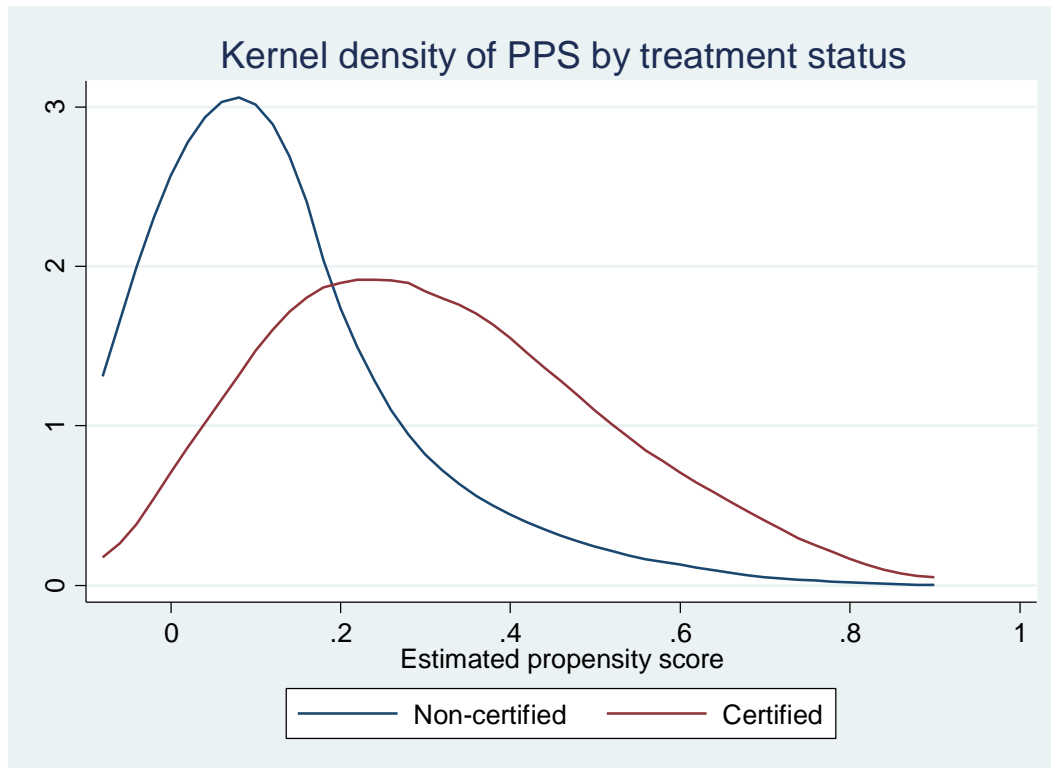


Figure A2—Distribution of propensity score (PPS) after matching