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Article — Accepted Manuscript (Postprint)

Where does the Fair Trade money go? How much consumers pay extra for Fair Trade coffee and how this value is split along the value chain

World Development

Provided in Cooperation with:

German Institute for Economic Research (DIW Berlin)

Suggested Citation: Naegele, Helene (2020) : Where does the Fair Trade money go? How much consumers pay extra for Fair Trade coffee and how this value is split along the value chain, World Development, ISSN 0305-750X, Elsevier BV, Amsterdam, Vol. 133, pp. --, <https://doi.org/10.1016/j.worlddev.2020.105006>, <https://www.sciencedirect.com/science/article/abs/pii/S0305750X20301327?via%3Dihub>

This Version is available at:

<https://hdl.handle.net/10419/266389>

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Where does the Fair Trade money go?

How much consumers pay extra for Fair Trade coffee and how this value is split along the value chain

Helene Naegele*

Abstract

Fair Trade certification aims at transferring wealth from the consumer to the farmer; however, coffee passes through many hands before reaching final consumers. Bringing together retail, wholesale, and stock market data, this study estimates how much more consumers are paying for Fair Trade-certified coffee in US supermarkets and finds estimates around \$1.50 per lb. The study then assesses how this price premium is split between the different stages of the value chain: most of the premium goes to the roaster's profit margin, while the retailer surprisingly makes smaller absolute profits on Fair Trade-certified coffee, compared to conventional coffee. In the period studied in this study, the coffee farmer receives about a sixth of the price premium paid by the consumer.

JEL codes: L15, L31, L66, O13, Q01.

Keywords: Coffee, Fair Trade, Price premium, Value chain, Voluntary sustainability standards.

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*I would like to thank Pio Baake, Jana Friedrichsen, Anna Lu, Johanna Mollerstrom, Hannes Ullrich, Céline Bonnet, Zohra Bouamra-Mechemache, Lucie Botega, Stéphane Caprice and Marion Desquilbet, as well as seminar participants at DIW Berlin and Toulouse School of Economics for helpful discussions. Jana Hamdan provided excellent research assistance. I would also like to thank Parker Townley from Fair Trade USA, Michael W. Kruger from IRI, and Andrew Rumpelt from NatPromo for helping me with data issues. I thank IRI for making the data available. All estimates and analysis in this paper, based on data provided by IRI are by the author and not by IRI. Financial support by the Leibniz Competition through the project GlobalFood (SAW-2015-DIW-4) is gratefully acknowledged. DIW Berlin, Mohrenstrasse 58, 10117 Berlin, Germany. hnaegele@diw.de, +49-30-89789-518.

Where does the Fair Trade money go?

How much consumers pay extra for Fair Trade coffee and how this value is split along the value chain

Sustainability concerns and commitment to responsible consumption are moving out of a niche and into mainstream culture of many industrialized countries in recent years. Given the complexity of production processes and value chains spanning the entire globe, consumer labels have emerged as a tool to synthesize information and orientate consumers towards responsibly produced goods.

The coffee market is notorious for the extreme poverty of many of its farmers with prices so low, in many years, they do not cover the production costs of small-scale farmers (e.g. Beuchelt and Zeller 2011). Moreover, coffee prices are volatile and make farmer livelihoods unpredictable (e.g. Janvry et al. 2015). Against this background, voluntary sustainability standards addressing sustainability concerns are particularly prevalent on this market (Fair Trade USA 2019).

The present study concentrates on the largest label for social sustainability: the Fair Trade¹ label as established by Fair Trade USA. The Fair Trade label addresses poverty concerns by guaranteeing a *fair price* for coffee growers, composed of a minimum price and a social premium (Janvry et al. 2015). After having been a niche market for many years, the market share of Fair Trade-certified products is rapidly increasing internationally with two-digit yearly growth over the past decade, and the label raised USD 79 million in farmer premiums in 2015 (FLO-Cert 2017).

Fair Trade labels provide consumers with the possibility to contribute to higher farmer income *via* the purchase of a product, but the money travels through the entire coffee value chain before reaching the farmer. This raises the question how efficiently consumers contribute to raising farmer income. How much do consumers have to pay in the supermarket for farmers to receive an additional dollar?

Beyond social responsibility and image concerns, roasters and retailers can use the Fair Trade label as a way to segment the market and skim the consumer's increased

¹Throughout this text "Fair Trade" refers to Fair Trade USA label, not to the general (philosophical) concept of fair trade. To avoid confusion, Figure 6 in the Appendix shows the logo discussed.

willingness-to-pay for Fair Trade-certified coffee (Hainmueller et al. 2015). Ground coffee is a differentiated good with considerable profit margins, as both the retail supermarkets and the companies that roast and package coffee are highly concentrated (Draganska et al. 2010). On the Fair Trade-certified segment of the coffee market, the split of the profit margin between roasters and retailers depends on how the Fair Trade label affects their relative market power (Bonnet and Bouamra-Mechemache 2016).

The literature finds consistently that consumers are willing to pay a price premium for the Fair Trade label (Loureiro and Lotade 2005, Basu and Hicks 2008, Didier and Lucie 2008). It remains an open debate whether this willingness-to-pay arises from pure altruism, “warm glow” (Andreoni 1989), or social image concerns (Friedrichsen and Engelmann 2018, Teyssier et al. 2014).

Different authors find dramatically different estimates for the magnitude of the Fair Trade retail price premium. Using panel data methods on price changes when existing products become Fair Trade-certified, Carlson (2008) finds that consumers pay a retail price premium for Fair Trade-certified coffee of \$0.12 per package, but he does not compute how this premium translates into farmer revenue. In a large field experiment in US supermarkets, Hainmueller et al. (2015) find that at constant prices, the Fair Trade label increases sales by 10%. With varying prices, the authors see that consumers have heterogeneous price elasticities. Combining data on Fair Trade prices and quantities and international estimates for the Fair Trade premium paid by the consumer, Gingrich and King (2012) find that consumers spend between \$4 and \$11 for transferring \$1 in social premium to the farmer. Some alternative fair trade initiatives respond to this logic by explicitly stating the amount and percentage share received by the farmers, e.g. Transparent Trade Coffee (2018).

Several features of the coffee value chain have been analyzed in the industrial organizations literature. Despite the importance of green beans as the main input for the production process, the pass-through between highly volatile coffee commodity prices and stable retail prices is low. Nakamura and Zerom (2010) build a menu cost model of oligopolistic price-setting by the roasters to explain delayed and incomplete pass-through. They find that menu costs play a small role when compared to local costs and mark-up adjustments. Similarly, Bettendorf and Verboven (2000) explain the low pass-through with the importance of local costs, which account for about 40% of total marginal cost. In their estimation, mark-up reductions in reaction to bean price play a minor role. Feuerstein (2002) proposes two models of the coffee market showing that, depending on market structure, roasters do not always benefit of low input prices.

The typical analysis of profit sharing along the value chain in the industrial organizations literature follows the influential paper by Draganska et al. (2010). The authors propose a model of bargaining between multi-product roasters and retail chains, where the wholesale price maximizes the “generalized Nash product” of roasters and retailers.

For each differentiated good, this Nash product is the product of each negotiator’s gains from trade (profits with the good minus profits without the good) weighted by their bargaining power.² The deviation profits (profits without the good) are endogenous to the model, while bargaining power is an exogenous characteristic depending, for example, on negotiation skills, information structure, or differences in time preferences.

The impact of labels on this bargaining power has been analyzed in other markets than coffee. Bonnet and Bouamra-Mechemache (2016) empirically apply a similar model to the French milk market and find that organic brands have a higher bargaining parameter λ , so the label shifts profits from the retailer to the milk manufacturer. In contrast, Schlippenbach and Teichmann (2012) build a theory model showing how retailers can require private quality standards to increase their buyer power. In their model, farmers incur costs when adapting to higher quality, so that they cannot sell to low-quality rivals without a loss.³ This shows that it is *a priori* not clear how Fair Trade labels affect the profit sharing along the value chain. The result depends both on bargaining power and on market power, with the latter determined by the outside option when negotiation fails.

Using less econometric and more accounting-based methods, the price differentials between Fair Trade-certified and conventional⁴ coffee have been analyzed along the value chain in the literature. Valkila et al. (2010) compare prices for Fair Trade-certified coffee and conventional coffee at different stages of the value chain. Comparing prices without controlling for brand and quality effects, they find that 48% (€2.30/kg) of the retail price of conventional coffee goes to the producer country (farmers, cooperatives, and exporters confounded) and only 35% (€2.60/kg) for Fair Trade-certified coffee: the overall amount is larger for Fair Trade-certified coffee, while the proportion is smaller. The authors conclude that the retail price premium paid by the consumer benefits mainly the roasters. Johannessen and Wilhite (2010) include the roaster and retailer into the picture and find that about 70% of the retail price paid for Fair Trade-certified coffee in Norway remains in the consumer country. The quoted number refers to the retail example, where the detailed shares are 13.8% for the retailer, 2.4% for the certifying body, 58.2% for the roaster. 12.5% goes to the cooperative and 13.1% to the farmer. Using data from coffee cooperatives in Ethiopia, Minten et al. (2018) find that about a third of the Fair Trade price premium at the export level, i.e. at the border of the producing country, is transmitted to farmers.⁵

²Formally, for good j the Nash product is defined as $(\pi_j^r(p_j^w) - d_j^r)^\lambda (\pi_j^m(p_j^w) - d_j^m)^{1-\lambda}$, where π_j^r and π_j^m are the profits to the retailer r and the manufacturer m if the negotiations succeed, d_j^r and d_j^m are the disagreement pay-offs obtained if the negotiations fail and p_j^w is the wholesale price, $\lambda \in [0, 1]$ is the retailer’s bargaining power.

³Schlippenbach and Teichmann (2012) use a similar Nash bargaining solution to Draganska et al. (2010), but set the bargaining parameter λ to 0.5, so that the profit sharing depends only on deviation payoffs.

⁴Throughout this study, I refer to non-Fair Trade-certified coffee as “conventional”, in analogy to the opposition between organic and non-certified products, called conventional.

⁵Minten et al. (2018) do not distinguish between organic certification and Fair Trade. The average price premium for certification at the farmer level is \$0.05 per lb of green coffee, while it is \$0.15 at the

Beyond the producer price premium discussed in this study, Fair Trade certification has also other benefits to farmers. In particular, the Fair Trade price rules may reduce income volatility and the Fair Trade social premium earmarked for community investment might solve coordination problems on the provision of public goods for the farming community. For example, the premium can be used to finance schools, infrastructure like processing facilities, and farmer trainings. Dragusanu and Nunn (2018) find that in Costa Rica, regions with a higher share of Fair Trade-certified cooperatives have higher schooling rates. Gitter et al. (2012) find a similar effect in Southern Mexico, especially for girls. These social aspects are beyond the scope of this study.

The present study focuses on the *difference* between coffee prices along the value chain for Fair Trade-certified and conventional coffee. How much do consumers pay extra for Fair Trade-certified coffee? Facing the great range of estimates on this retail price premium in the literature, the present study answers this question by applying hedonic price regressions to a large retail data set, controlling for brand and quality characteristics. How much of this price premium goes to the farmer? Assuming that farmers receive the producer prices stipulated by the Fair Trade standard for all coffee they sell under the Fair Trade label, this study determines the share of the retail price premium going to the farmer. Who receives the remaining portion of this price premium? Using exceptional data on wholesale prices and hedonic price regression, this study shows how the Fair Trade label affects bargaining power or market power between roasters and retailers. While market power has been examined in the coffee market without any label and in other product markets with labels, this study is the first to look at this aspect for Fair Trade-certified coffee.

The present study estimates that in US supermarkets from 2010 to 2012 consumers paid around \$1.50 per lb (estimates ranging from \$1.10 to \$2.03 per lb) more for Fair Trade-certified coffee than for similar conventional coffee. I find that the Fair Trade label increases the roaster margin by more than \$1.50 per lb with compared to conventional coffee, while retailers make *smaller* margins on Fair Trade-certified coffee. Producers received about a seventh (around \$0.21 per lb for the 2010 to 2012 period) of the retail price premium paid by the consumer.

First, Section 1 explains some background information on the coffee market and the Fair Trade label and Section 2 and introduces the conceptual framework. Then, Section 3 describes the data, gives some descriptive statistics, and explains the methodology. Section 4 presents the results on the price premium for Fair Trade-certified coffee along the value chain and Section 5 interprets these results and discusses limitations of the present study. Finally, Section 6 concludes.

export level.

1 Background

1.1 Background on the coffee market

The present study draws heavily on the structural analysis of the standard coffee value chain by Valkila et al. (2010) and Ponte (2002). The typical coffee value chain starts with a producer, who can be anything between a small-scale farmer and a plantation with large numbers of hired workers. Small-scale farmers often do not sell directly, but rather *via* a cooperative or an export company, as the coffee cherries must be peeled and dried to be transformed into green beans before shipping and this requires equipment investments that are not viable for individual small-scale farmers.

These producers sell to roasters or trading firms, which are highly concentrated around the globe and often trade many food commodities, e.g. Olam International, Louis Dreyfus Group, Volcafe. Some of the commodity-grade green coffee is traded on stock exchanges, while most is traded bilaterally. Empirical research has shown that transaction prices for conventional coffee between international trading companies and farmer cooperatives are indexed on the stock market prices (e.g. Janvry et al. 2015, Valkila et al. 2010).⁶ More expensive higher-quality grades, organic certified, and specialty coffee are sold at higher prices, but contracts are typically also indexed on this stock exchange price.

The coffee is shipped as green beans to the consuming country. There, the roaster roasts and packages the beans, transforming the commodity into a branded (differentiated) consumer good. For the roasters, coffee is a product with a high cost share of the main input (green beans) and a simple production function that uses beans, packaging, energy, and labor in fixed proportions.

The coffee is then sold to retail stores, which in many countries are organized in highly concentrated retail chains. The consumer market for ground coffee is an oligopoly market with strong brands, achieving high retail prices (Bettendorf and Verboven 2000).

1.2 Background on the Fair Trade label

Throughout the 20th century, there have been calls for “fairer trade” and initiatives to support the living standard of farmers in developing countries. After the collapse of the International Coffee Agreement (ICA) system in 1989, the income of producer countries fell by about 85% (Johannessen and Wilhite 2010). Since then, producer prices have become more volatile and concerns about the viability of small-scale coffee farming are increasing (e.g. Ponte 2002). In 1988, the Max Havelaar organization was founded in

⁶The fair trade/direct trade website Transparent Trade Coffee (2015) compiles data on hundreds of Fair Trade contracts and finds 87% use the “C” price. Moreover, open-ended, semi-structured interviews with large trading firms in Bogotá, Colombia, in July 2016 by the author of this study confirm the assumption that contracts are indexed on stock market prices, plus constant country-, quality- and certification-specific premiums.

the Netherlands, generally recognized to be the first Fair Trade labeling organization. Soon, similar national organizations were founded in other industrialized countries, like TransFair Deutschland, Trans Fair USA, Max Havelaar France.

While the early fair trade movement was selling products in specialized “world shops,” the current Fair Trade labeling system is characterized by the cooperation with mainstream retailers and roasters.

The non-profit organization, i.e. Fair Trade USA, defines a standards catalog and the third-party certification company, i.e. FLO-Cert GmbH or SCS Global Services, Inc., audits conformity to the standard and administrates the license to use the label. In order for a product to be Fair Trade-certified, the producer (e.g. farmer cooperative), the exporter (typically an international commodity trading firm), and the roaster (national or multinational consumer brands) have to be certified by the Fair Trade licensor. Neither the non-profit standard setter nor the third-party certifier buys, roasts, or sells any coffee.

The main selling point of Fair Trade-certified coffee is the “fair producer price” (Hainmueller et al. 2015, Valkila et al. 2010), as Fair Trade is the only labeling scheme explicitly including prices in their standard. The Fair Trade price is given by the maximum between the Fair Trade floor price of \$1.21 per lb⁷ and the market price, given for Arabica by the “C” contract on the New York stock exchange. Additionally, cooperatives receive a social premium of \$0.20 per lb of coffee sold under the Fair Trade label.⁸ Cooperatives should invest this social premium “in the producers’ business, livelihood, and community” (FLO-Cert 2017). In addition to raising the price level, such a minimum price rule reduces volatility. To put this price into perspective, note that the target price range of the ICA for 1980 to 1989 was \$1.20-1.40 per lb (Akiyama and Varangis 1990), which in current 2018 US dollars is equivalent to \$2.44-2.84 per lb.⁹

Figure 1 shows the conventional and Fair Trade-regulated price for Arabica coffee, the period used in this study appears in light blue on the figure. Up to 2007, world prices are mostly below the Fair Trade floor price, then prices hugely increase between 2008 and 2013 and are mostly above the Fair Trade floor price. Between 2013 and 2017, the world market prices oscillate again around the Fair Trade floor price.

The production of Fair Trade coffee is increasing, with 13% compound annual growth worldwide 2008-2012 (Potts et al. 2014). Coffee is a market with a large proportion of Fair Trade sales, nevertheless the global market share remains small: the worldwide market share of Fair Trade-certified coffee in 2012 is 1.6% (Potts et al. 2014). In my data on US

⁷Floor prices are minimum prices. \$1.21 per lb is the floor price valid for washed green Arabica FOB in 2018. All prices in \$ refer to nominal United States dollars, not corrected for inflation. The Fair Trade floor price aims at protecting farmers against low world prices. The floor price is infrequently updated: from the beginning until April 2011, the floor price was \$1.21 per lb (Fair Trade USA 2018).

⁸\$0.10 per lb before April 1st, 2011 and \$0.05 per lb before January 2008. Please refer to the organization’s websites Fair Trade USA (2019) and Fair Trade Campaigns (2018) for more detailed information.

⁹Adjustment for CPI inflation from 1989 to 2018 using U.S. Bureau of Labor Statistics (2018).

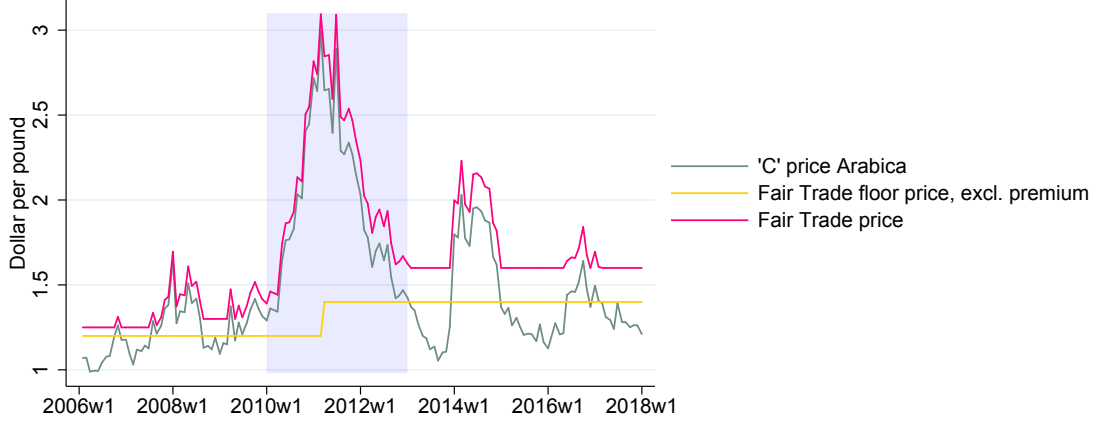


Figure 1: Commodity prices of conventional and Fair Trade-certified Arabica coffee (including social premium), time period of this study is shaded in blue

Source: “C” coffee future from Investing.com (2018); Fair Trade documentation on Fair Trade USA (2019); own computations.

retailing, the Fair Trade market share is 2.5% in 2012.

2 Conceptual framework

For the sake of clarity, the value chain of coffee is stylized in this study to three crucial steps: producers sell green beans to roasters, then roasters transform the beans into roasted coffee and sell it to retailers, then retailers sell the packaged good to final consumers. An overview is given in Figure 2: the three blue blocks are each treated as “black boxes” in the present study. As one can see, this study simplifies in particular the part of the value chain which takes place in the producing country, involving farmers, cooperatives, intermediary traders and export companies.

This study cannot describe the profit sharing between cooperative and farmer. Both the payment of the license fee and the investment of the social premium are managed

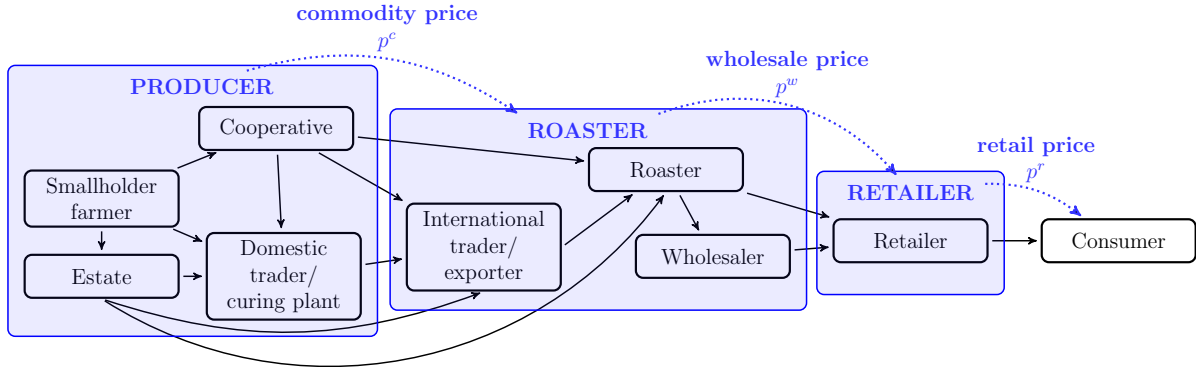


Figure 2: Stylized coffee value chain as analyzed in this study

Source: Adapted from Valkila et al. (2010) and Ponte (2002)

at cooperative level. Technically, the cooperative belongs to its members, so that in the theoretical Fair Trade literature, cooperatives and farmers are often seen as one single actor. However, the empirical literature shows that farmers often see the cooperative as one potential buyer amongst many and they sell to the one offering highest prices (e.g. Valkila and Nygren 2010). In the absence of information on profit-sharing between farmers, cooperatives and export companies, I treat these agents together as one stage of the value chain that I call “producers”.

Empirical research has shown that effective transaction prices for commodity-grade conventional coffee are indeed close to the stock market prices and transaction prices for Fair Trade-certified coffee are close to the regulated Fair Trade price (e.g. Janvry et al. 2015, Valkila et al. 2010, Transparent Trade Coffee 2018). A likely explanation is that green beans are a homogeneous good, so that individual farmer cooperatives have virtually no market power. The Fair Trade price depends on the Fair Trade rules and the market price of conventional coffee, so it is not a result of demand and supply for Fair Trade coffee. I thus assume farmer cooperatives receive either the stock market price (for conventional coffee) or the Fair Trade regulated price (for Fair Trade-certified coffee).

The trading companies are unlikely to have large market power in this market, as they trade homogeneous commodity coffee and not a differentiated good. Like the farmers, they probably suffer from the immense over-supply of Fair Trade-certified coffee, but to my knowledge, there exists little research on trading companies’ market power. Large roasters sometimes buy coffee directly from the producers. In the absence of information on which roasters trade directly and on the profit margins of trading companies, I consider roasters and international traders together as one stage of the value chain.

When analyzing profit-sharing along the value chain, one often has to confront the problem that each agent has costs that are unknown to the researcher. In the mainstream segment of the coffee market, Fair Trade-certified and conventional coffee may be sold by the same producers, roasters and retailers. Limiting the analysis to this segment of the coffee market, this study examines the *difference* of margins between two very similar value chains. The following paragraphs explain assumptions taken on the cost structure along the value chain. Unfortunately, there is little rigorous data on this aspect available.

The majority of Fair Trade-certified farmer cooperatives selling Fair Trade-certified coffee also sells conventional coffee, and the share of conventional coffee is often very large (Janvry et al. 2015, Valkila and Nygren 2010, Potts et al. 2014). In order to participate in the Fair Trade system, these cooperatives incur license fees, administrative costs of complying to the standard and costs of adjusting their production processes.¹⁰ These fees

¹⁰The Fair Trade standards cover organizational structure, environmental problems, fertilizers, working conditions, and child labor. Some of these other dimensions are seen as ideal targets and their fulfillment is not immediately mandatory for participating cooperatives. Fair Trade USA (2017) details the requirements for cooperative certification by Fair Trade USA, where the organization defines *minimum* and *progress* requirements, where the latter are not mandatory. The document for example states

are fixed costs, i.e. costs that do not depend on the amount of goods produced.¹¹ Within a Fair Trade-certified cooperative, variable production costs, i.e. costs that depend on the quantity produced, are unlikely to differ between Fair Trade-certified and conventional coffee, because physically the same bean might be sold in either category. This study does not examine how much farmers pay for their license and how much they have to spend to comply to the standard’s requirements.

The cost share of green bean input is estimated around 60% of total cost of coffee roasters, leaving around 40% for roasting, packaging and marketing expenses (Bettendorf and Verboven 2000).

In order to be Fair Trade-certified, roasters have to pay a license fee and follow several non-financial requirements, which might create additional costs. The main requirements for roasters are ensuring documentary and physical traceability of the certified coffee,¹² following official legislation on labor and environment, avoiding the products listed on Fair Trade’s Prohibited Materials List, establishing written contracts with producers, paying the Fair Trade minimum price and Fair Trade premium, and providing pre-harvest finance options (Fairtrade International 2015).

The non-financial requirements are likely to cause some fixed adjustment cost to roasters acquiring Fair Trade certification. However, all four trading companies interviewed for this study stated that they treat producers of conventional and Fair Trade-certified cooperatives equally and establish similar contracts (including long-term contracts and pre-harvest finance). In all four cases, the cooperatives providing Fair Trade-certified coffee also provided conventional coffee to the trading company, often within the same truckloads. One of the companies pointed out that maintaining two separate logistics chains for physical traceability is costly.

Up until 2012, Fair Trade-certified roasters had pay the Fair Trade licensor a license fee of \$0.10 per lb of Fair Trade-certified coffee. Since 2012, Fair Trade USA has changed the rules such that small roasters (below 20,000 lbs of coffee per year) pay no fee, while larger roasters pay a fee between \$0.05 and \$0.085 per lb, depending on the share of Fair Trade-certified coffee in their business (Fair Trade USA, private communication in 2018).

Beyond the fixed costs and license fee, none of the trading companies stated any additional cost from participating in the Fair Trade system. In particular, the variable cost of transporting, roasting and packaging each pound of coffee is stated not to differ

“workers receive fair wages,” which translates into one mandatory criterion: “Salaries and wages are in line with or exceed legally mandated minimum wages for the job.” The large majority of environmental criteria is not mandatory.

¹¹Larger cooperatives pay higher fees, but the fees are not conditional on amounts produced or sold (Fair Trade USA 2019).

¹²For some commodities, such as cocoa or cane sugar, “mass-balancing” has been introduced, such that physical products must not be separated and only aggregate quantities of certified and conventional products must be accounted for. For coffee, mass-balancing is not admitted by the Fair Trade standard (FLO-Cert 2018).

between Fair Trade-certified and conventional coffee.

The retailer does not need to be licensed in order to sell Fair Trade-certified products. The retailer therefore has neither additional requirements nor license fees to bear.

Summing up the previous paragraphs, we see that Fair Trade certification causes *fixed* (i.e. independent of produced quantity) costs due to licensing fees, production process changes and physical traceability. *Variable* (i.e. per pound) cost for growing, transporting, roasting, packaging and retail shelf-space are likely to be similar for Fair Trade-certified and conventional coffee. In modern industrial organizations theory, prices are reflecting variable costs and mark-ups in heterogeneous goods markets (Draganska et al. 2010, Bonnet and Villas-Boas 2016). Fixed costs play a crucial role for the decision to enter a market, but are not determinant for price levels. If we take the assumption that Fair Trade-certified coffee has higher fixed costs, but similar variable costs as conventional coffee, we may see price differences along the value chains as indicative of differences in profit margins.

3 Data and methods

3.1 Data sources

This study brings together sources on the coffee commodity market, roasters, and retailers, as well as information the Fair Trade standard.

For the general structure of the analysis, I conducted open-ended, semi-structured interviews with four large trading companies in Bogotá, Colombia, in July 2016. Unfortunately, all four companies wished to stay anonymous and the information was only used to decide on underlying assumptions about market structure. These companies are part of large conglomerates dominating mainstream international food commodity trade worldwide. In absence of representative quantitative evidence, this study takes assumptions based on information from these four companies.

The market price for Arabica coffee is used as a proxy for producer prices. The price for Arabica is taken from the “C” coffee futures on the New York Stock Exchange as quoted on Investing.com (2018).¹³ To determine the Fair Trade producer price for each period, I combine stock market prices and Fair Trade rules on the floor price and social premium, as shown in Fig. 1. I use this stock market price as a proxy for producer prices, knowing that effective transaction prices might differ.

Industry wisdom as quoted in Bettendorf and Verboven (2000) and Valkila et al. (2010) says 1.19 lb of green coffee beans transforms into 1 lb of roasted coffee, as roasting

¹³Throughout this study, I use prices for Arabica coffee. Virtually all coffee is composed of either Arabica, Robusta, or a mix of both, but I do not observed the composition of the products. Robusta and Arabica stock market prices are highly correlated. “C” futures on the New York Stock Exchange (NYSE) are the reference price for Arabica, and London stock exchange gives the reference for Robusta.

evaporates water out of the beans.

Roasters have to be certified to sell Fair Trade-certified coffee and Fair Trade USA kindly provided the price schedule of license fees (Fair Trade USA, private communication in 2018). Moreover, Fair Trade USA provided a UPC-level list of Fair Trade-certified products with the date they first received the certification. This data is matched to the wholesale and retail price data.

The Price-Trak data set from National Promotion Reports LLC. (2016) provides wholesale prices, i.e. the roaster’s revenue per unit, for roasted coffee in 57 local US markets for the years 2001 to 2012.¹⁴ This data provides daily information about regular list prices and wholesale promotions at the Universal Product Code (UPC) level for each of the covered markets. An important limitation of the data is that only about half of US supermarket chains buy from wholesalers (Nakamura and Zerom 2010), while the biggest retailers make direct contracts with roasting companies. My results based on this data are thus only valid for these intermediate-size retailers.

For the retailer, these wholesale prices are the main input cost. Retail prices and sales are taken for this study from the research data set provided by Information Resources Inc. (2015) on grocery supermarkets and drug stores in 50 local US markets for the years 2001 to 2012. This data set is described in great detail by Bronnenberg et al. (2008) and contains UPC-week-level coffee sales for each supermarket in the IRI panel. Protecting sensitive business data, IRI makes retail chains anonymous, so I cannot use information on private label coffee.

Beyond the coffee-specific data, I use data on taxes from the Tax Foundation (Tax Foundation 2010). There is no federal coffee import tax in the US, but retail coffee sales are subject to the state-specific grocery taxes. The grocery tax rates varies between 0% (for 35 of the 50 IRI markets) and 5.5% (Knoxville, Tennessee).

The final main data set is a selected subsample of the total data, determined by the overlap of data sources, because this study only uses products for which complete data is available and concentrates on years where Fair Trade-certified products had a significant market share. The Appendix B gives a detailed overview of the selection.

3.2 Descriptive statistics

The main data set for the years 2010 to 2012 contains close to 2 million week-store-UPC-level observations from 21 markets (in 13 US states) and 775 stores. There are 340 distinct UPC-level products from 55 brands, produced by 23 parent companies. The coffee market is highly concentrated: the three largest parent companies (J.M. Smucker Company, Kraft Foods, and Massimo Zanetti USA) cover a market share of over 80%.

¹⁴The wholesale data used in this study is a longer version of the data used in Nakamura and Zerom (2010), when National Promotion Reports was called PromoData.

| | Mean | SD | Minimum | Median | Maximum |
|--------------------------|-----------|--------|---------|--------|---------|
| Package size (in oz.) | 16.2 | 9.1 | 5.3 | 11.3 | 39.0 |
| Package size (in g) | 459 | 258 | 150 | 320 | 1106 |
| Retail price per unit | \$6.70 | \$2.92 | \$1.20 | \$5.99 | \$27.46 |
| Retail price per lb | \$7.26 | \$2.45 | \$1.59 | \$6.94 | \$30.70 |
| Wholesale price per unit | \$5.48 | \$2.66 | \$0.87 | \$4.34 | \$14.82 |
| Wholesale price per lb | \$5.74 | \$1.54 | \$1.16 | \$5.42 | \$14.80 |
| Producer price per unit | \$2.42 | \$1.48 | \$0.54 | \$1.84 | \$8.02 |
| Producer price per lb | \$2.40 | \$0.54 | \$1.52 | \$2.24 | \$4.16 |
| Grocery tax per lb | \$0.01 | \$0.04 | \$0.00 | \$0.00 | \$0.60 |
| Fair Trade-certified | 5.35% | 0.23 | 0 | | 1 |
| Organic | 0.36% | 0.06 | 0 | | 1 |
| Decaffeinated | 19.32% | 0.40 | 0 | | 1 |
| Observations | 1,874,732 | | | | |

Table 1: Descriptive overview of main data set

Source: main data set with observations at UPC-week-store level, not sales-weighted, own computations.

Only five companies offer Fair Trade-certified coffee.

Table 1 provides a descriptive overview of the UPC-week-store-level main data set. Package size varies widely, between 150g and 1106g with an average of 459g. The data contains prices on three steps of the value chain: at the producer level, the price is on average \$2.40 per lb, at wholesale level it is \$5.74 per lb, and for the retail consumer it is \$7.26 per lb. In the final data, 5.35% of the observations are Fair Trade-certified, while 0.36% are organic. Decaffeinated coffee makes up 19.32% of the observations. The grocery tax is so small that most of the following analysis does not explicitly refer to it.

Fair Trade-certified coffee does not appear in the IRI retail data until 2008. The market share then quickly increases, reaching 3% (of value and of units purchased, among ground coffee) in 2011 and 2.5% in 2012.¹⁵

| | Not organic | Organic | Total |
|--------------|-----------------------|------------------|------------------------|
| Conventional | 1,774,233 (94.64%) | 181 (0.01%) | 1,774,414 (94.65%) |
| Fair Trade | 93,668 (5.00%) | 6,650 (0.35%) | 100,318 (5.35%) |
| Total | 1,867,901 (99.64%) | 6,831 (0.36%) | 1,874,732 (100.00%) |

Table 2: Frequencies of certification: comparison and overlap of Fair Trade and organic

Source: main data set with observations at UPC-week-store level, own computations.

In addition to Fair Trade certification, coffee is often also certified as organic. Table 2

¹⁵This market share is smaller than the 5.35% in Table 1, because it is weighted by sales and Fair Trade-certified coffee is bought relatively little compared to its availability in stores. These numbers exclude the single-cup pods, which are often Fair Trade-certified. Unfortunately, IRI data is not available for more recent years.

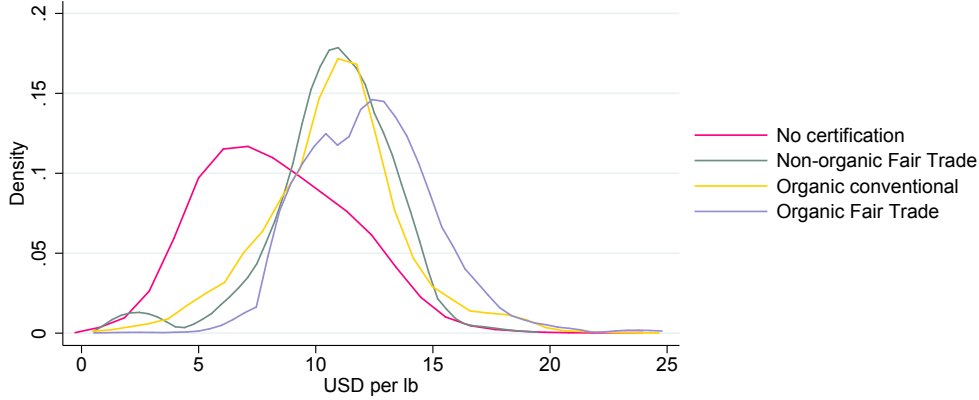


Figure 3: Distribution of retail prices in 2012

Kernel density using Stata's `kdensity` with a bandwidth of 0.45. Pairwise Kolmogorov-Smirnov test for equality of distribution functions finds that all four distributions are significantly different from each other with $p < 0.001$. Source: main data set, own computations.

shows the number of certified products at UPC-week-store-level. We see that organic certification is marginal compared to Fair Trade certification. There is substantial overlap in certification: Fair Trade-certified coffee is much more likely to carry organic certification than conventional coffee.

Figure 3 shows the retail price distribution for ground coffee with and without certification. We see that non-certified coffee is cheapest. Certified coffee is more expensive. Fair Trade-certified and organic have about the same retail price distribution, while the retail price for coffee with both Fair Trade and organic certification is slightly higher.

This study concentrates on the price premium for Fair Trade-certified coffee over conventional. Table 3 shows the price premium for Fair Trade certification over conventional (both organic and non-organic) along the value chain. The difference in prices is significant (two-sided t-test) at all levels of the value chain. The retail and producer prices *per unit* are smaller for Fair Trade-certified coffee, as the package size is typically smaller than for conventional coffee.

The literature (Nakamura and Zerom 2010, Bettendorf and Verboven 2000, Feuerstein 2002) finds that retail prices do move less than one-to-one with producer prices. My data as reflected in Figure 4 is consistent with this finding. While wholesale prices and retail prices move in parallel, producer prices only loosely correlate with wholesale and retail prices. For example, a graphical analysis of Figure 4 suggests that the producer price surge of green coffee prices in 2011 was transmitted into wholesale prices, while the subsequent decrease in green coffee price in 2012 did not lead to lower wholesale and retail prices. This pattern is consistent with asymmetric cost pass-through, as in Bonnet and Villas-Boas (2016). The correlation between retail prices and wholesale prices is 0.77, while the correlation between retail and producer prices is only 0.13.

| | Conventional | Fair Trade | Difference | |
|--------------------------|--------------|------------|------------|-----|
| Retail price per unit | \$6.71 | \$6.56 | -\$0.15 | *** |
| Retail price per lb | \$7.10 | \$10.02 | \$2.91 | *** |
| Wholesale price per unit | \$5.47 | \$5.61 | \$0.13 | *** |
| Wholesale price per lb | \$5.58 | \$8.59 | \$3.02 | *** |
| Producer price per unit | \$2.45 | \$1.83 | -\$0.63 | *** |
| Producer price per lb | \$2.38 | \$2.80 | \$0.42 | *** |
| Observations | 1,774,414 | 100,318 | | |

Two-sided Welch t-test, unequal variances. Stars denote significance: *** means $p < 0.01$.

Table 3: Comparison of Fair Trade and conventional coffee prices along the value chain and significance of price differences (t-test)

Source: main data set with observations at UPC-week-store level, own computations.

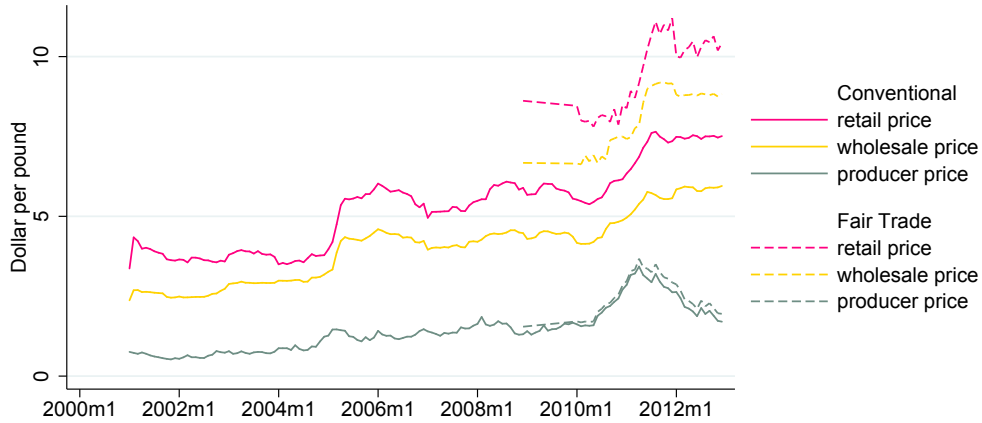


Figure 4: Price evolution at retail, wholesale and producer level
Solid lines show conventional coffee, dashed lines show Fair Trade-certified coffee.

Source: main data set, own computations.

3.3 Econometric methods

Ideally, we would like to consider products that switch from conventional to Fair Trade-certified. In that case, comparing prices before and after the switch would allow us to identify the retail price premium of Fair Trade certification for otherwise identical products, such as in Carlson (2008). Unfortunately, in my data set, only one UPC-level product switches in this way. Generally, roasters prefer introducing new products with certification, rather than adding the Fair Trade label to existing products. Therefore, I propose two control strategies. First, I use hedonic price regressions, controlling for brand fixed effects and all observable characteristics. Then, I compare the products from those roasters only that sell both Fair Trade-certified and conventional coffee.

Following Lancaster (1966), a product can be modeled as a bundle of characteristics and its price is then the sum of the prices of each characteristic. The value of each characteristic can then be computed with a hedonic pricing approach, as in Minten et al. (2018), where we regress the price of a good on a vector of its characteristics.

I use the hedonic price regression on retail prices to determine the Fair Trade retail price premium paid by consumers. The estimation equation of the main regression reads as follows:

$$p_i^r = \alpha + \beta X_i + \gamma \mathbb{1}_i^{FT} + \nu_t + \nu_b + \nu_m + \epsilon_i, \quad (1)$$

where p_i^r is the retail price per lb of product i , $\mathbb{1}_i^{FT}$ is an indicator variable that is equal to 1 if the product i is Fair Trade-certified, X_i is a vector of product characteristics including decaffeination, organic label, package size, and package size squared, ν_b are brand fixed effects controlling for brand image and quality, ν_t are week fixed effects controlling for time variation, ν_m are market fixed effects controlling for geographical variation.

I then estimate the Fair Trade price premium at the other two stages of the value chain. For roasters, the estimation equation is identical to equation (1), except that the retail price p_i^r is replaced by the wholesale price p_i^w . For the producer price premium, I use a simplified version of equation (1) on the commodity coffee price p_i^c controlling only for labels, as the coffee sold by cooperatives is not yet branded, packaged or regionally affected.

In order to obtain valid results, we need to control for quality differentials which affect price differences. Within the data used for this study, quality differentials are less important than on the overall coffee market, as we consider only mainstream coffee brands sold in general supermarkets. This leaves aside a large (and growing) specialty coffee market. Moreover, the hedonic price regression attempts to control for quality differentials by including roaster fixed effects and coffee characteristics such as decaffeination and organic labels.

Additionally, I give an overview over Fair Trade-certified and conventional products by the companies that sell both Fair Trade-certified and conventional coffee. This selection

| | Retail price per lb p^r | | |
|----------------------|---------------------------|---------------------|---------------------|
| | (1) | (2) | (3) |
| Fair Trade-certified | 2.03*** (0.007) | 1.84*** (0.007) | 1.20*** (0.015) |
| Decaffeinated | | 0.19*** (0.004) | 0.35*** (0.003) |
| Organic | | 2.85*** (0.025) | 0.85*** (0.027) |
| Vol (lb) | -4.31*** (0.026) | -4.38*** (0.026) | -4.61*** (0.026) |
| Vol (lb) squared | 0.86*** (0.010) | 0.89*** (0.010) | 1.04*** (0.009) |
| Constant | 8.45*** (0.040) | 8.43*** (0.040) | 8.89*** (0.144) |
| Market FE | Yes | Yes | Yes |
| Week FE | Yes | Yes | Yes |
| Company FE | No | No | Yes |
| N | 1,874,732 (all columns) | | |
| R2 | 0.34 | 0.35 | 0.46 |

Standard errors in parenthesis, *** means $p < 0.01$.

Table 4: Hedonic price regression for retail prices (in USD per lb)
Source: main data set with observations at UPC-week-store level, own computations.

dramatically reduces the data size, but ensures a more homogeneous quality level across compared products. On these selected products, I graphically compare the average price for Fair Trade-certified and conventional products at the producer, roaster and retailer level.

4 Results

Table 4 shows the result of a linear regression of retail prices on product characteristics, as well as market, week, and company fixed effects. Column (1) displays the coefficients for the most simple specification, using no company fixed effects and controlling only for package volume. In this specification, Fair Trade-certified coffee is \$2.03 per lb more expensive than conventional coffee. Column (2) adds dummies for organic certification and decaffeination, which reduces the estimate for the Fair Trade retail price premium to \$1.84 per lb. Column (3) controls for brand image by adding company fixed effects. This further reduces the estimate for the Fair Trade retail price premium to \$1.20 per lb.

I then estimate the Fair Trade price premium at the other two stages of the value chain. Table 5 shows the results for wholesale prices (column (1) to (3)) and producer prices (column (4)). I first regress wholesale prices on product characteristics and then add further fixed effects. Controlling for characteristics and brand fixed effects reduces

| | Wholesale price per lb p^w | | | Producer price p^c |
|----------------------|------------------------------|---------------------|---------------------|----------------------|
| | (1) | (2) | (3) | (4) |
| Fair Trade-certified | 2.54*** (0.004) | 2.45*** (0.004) | 1.44*** (0.008) | 0.21*** (0.000) |
| Decaffeinated | | 0.04*** (0.002) | 0.17*** (0.002) | |
| Organic | | 1.42*** (0.014) | 0.51*** (0.014) | 0.37*** (0.000) |
| Vol (lb) | -2.45*** (0.015) | -2.45*** (0.015) | -1.82*** (0.014) | |
| Vol (lb) squared | 0.57*** (0.006) | 0.58*** (0.006) | 0.40*** (0.005) | |
| Constant | 5.62*** (0.023) | 5.60*** (0.023) | 5.15*** (0.077) | 1.73*** (0.000) |
| Market FE | Yes | Yes | Yes | No |
| Week FE | Yes | Yes | Yes | Yes |
| Company FE | No | No | Yes | No |
| N | 1,874,732 (all columns) | | | |
| R2 | 0.44 | 0.44 | 0.61 | 0.99 |

Standard errors in parenthesis, *** means $p < 0.01$.

Table 5: Hedonic price regression for wholesale and producer prices (in USD per lb)
Source: main data set with observations at UPC-week-store level, own computations.

the estimate of the wholesale price premium for Fair Trade, but it is always higher than the corresponding estimate for the retail price premium in Table 4. Column (3) gives the main estimate for the Fair Trade wholesale price premium and states that roasters receive \$1.44 per lb more for Fair Trade-certified coffee, compared to conventional coffee.

The producer price is independent of the final package size and decaffeination, as these product characteristics arise only after roasting. Using stock market prices, there is no geographical or between-brand variation in producer prices and, thus, no need for market and company fixed effects. The producer price premium is estimated around \$0.23 per lb (Table 5, column (4)).

Taking an alternative, more graphical, approach, I compare prices keeping only the four companies that produce both Fair Trade-certified and conventional coffee, assuming that their brand value and quality should be more homogeneous than the entire sample.¹⁶ These four companies cover only 3% of the market. Table 6 in the Appendix shows that their products are significantly different in all of the observable characteristics compared to other companies' products: products from these four companies are, on average, \$0.82 more expensive and significantly smaller (11.4 oz vs. 16.4 oz for other companies). Con-

¹⁶Actually, the largest coffee roaster in my sample, the J.M. Smucker Company (owner of the Folger's coffee brand), held a small brand called Millstone that sold some Fair Trade-certified coffee. I exclude Smucker from the list of Fair Trade-certified roasters, because Fair Trade-certified coffee constitutes only .0068% of Smucker's sales.

sequently, their price level per pound is significantly higher than for the other companies on the market (\$10.53 vs. \$7.08 per lb), placing these brands in a premium segment of the coffee market. They are significantly more often certified organic and less often decaffeinated.

Figure 5 shows the average price per pound for Fair Trade-certified and conventional coffee in 2012 at the producer, roaster and retailer level for those companies that offer both.¹⁷ On the left-hand side, Figure 5a shows that the retail price for Fair Trade-certified coffee is, on average, \$1.10 per lb higher (\$10.27 per lb vs. \$9.17 per lb) and shows the decomposition along the value chain to the producer, roaster, and retailer. On the right-hand side, Figure 5b is subtracting the two columns of Figure 5a from each other and thereby shows only the difference between the Fair Trade-certified and conventional at each stage of the value chain. Similar to the analysis on the regression results, we see that producers receive an average of \$0.24 per lb more for Fair Trade-certified coffee, roasters receive \$1.16 per lb more and retailers receive on average \$0.27 *less* per lb.

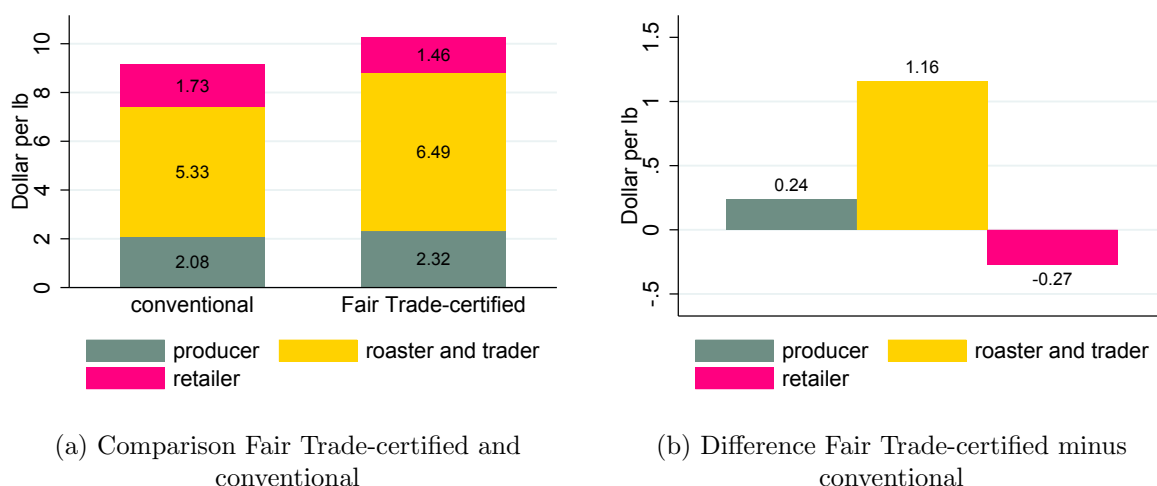


Figure 5: Decomposition of the retail price (in USD per lb) for Fair Trade-certified and conventional coffee.

Source: main data only for 2012, keeping only the four companies selling Fair Trade-certified coffee, grocery tax deducted and not shown; own computations.

These two complementary approaches come to roughly to the same distribution of the Fair Trade premium along the value chain.

¹⁷Such a graphical analysis does not control for time variation. As most of the Fair Trade sales are concentrated in 2012 in my data, a comparison of Fair Trade-certified versus conventional over the entire three years gives a biased estimate. Table 7 in the Appendix gives the regression results for these companies analogously to Table 4 and 5. I do not deduce the additional Fair Trade roaster fee here, because Fair Trade USA set it to zero for many roasters since the beginning of 2012.

5 Discussion

Comparing annual mean prices, Valkila et al. (2010) estimate a retail price premium of around \$1.60 per lb¹⁸ for Finnish retail markets between 2006 and 2009. The result of this study, finding a price premium between \$1.10 and \$2.03 per lb is close to this result. Carlson (2008) finds a Fair Trade retail price premium of \$0.12 per package over conventional products, which at an average package size of 0.664 lb in his data is equivalent to a premium of \$0.18 per lb. This result is much lower than my estimates, but it is estimated on a limited and highly selected number of products.

The present study examines the *difference* of prices at the different stages of two similar value chains. If the assumption about the similarity of variable cost for transporting, roasting, and packaging between Fair Trade-certified and conventional holds, these differences can be interpreted as differences in marginal profit margins. Following my regression results, retail consumers pay \$1.20 per lb more for Fair Trade-certified coffee (Table 4, column (3)), while the wholesale price premium is \$1.44 per lb and the producer price premium \$0.21 per lb (Table 5, column (3) and (4)). Thus, retailers make $(1.20 - 1.44 =)$ \$0.24 *less* profit per lb of Fair Trade-certified coffee, compared to conventional coffee, while roasters make $(1.44 - 0.21 - 0.10 =)$ \$1.13 more.¹⁹

The producer portion of this premium is between a sixth and a seventh of the retail price premium. Previous research (e.g. Gingrich and King 2012) suggests measuring the “efficiency” of the Fair Trade system: if a Fair Trade system aims at transferring value to farmers, one might compute how efficient this transfers money from the consumer to the farmer. Taking my regression results, the consumer would have to spend an additional $(1.20 / .21 =)$ \$5.71 in order to increase producer income by \$1, which is roughly in line with the estimates between \$4 and \$11 of Gingrich and King (2012).

Using a simple theory model, Janvry et al. (2015) make the strong claim that, in equilibrium, *all* of the Fair Trade benefits go toward the payment of the farmer license fees. However, lacking the necessary data, the present study cannot add any information on this aspect and does not consider the share of the Fair Trade premium going to the labeling organization.

Why is the value added shared differently between retailers and roasters? The standard model in the industrial organizations literature follows the lines of Draganska et al. (2010). This model offers two potential explanatory mechanisms. One explanation is increased bargaining power mediated by stronger negotiators, but this typically applies to all products of a given roaster. As the Fair Trade-premium is observed here *within* the products of a given roaster, this explanation does not appear suitable. The alternative explanation is market power, resulting from the outside option of the negotiating

¹⁸Converted from 2.80€/kg using the exchange rate quoted in Valkila et al. (2010).

¹⁹The \$0.10 are the Fair Trade license fee for roasters before 2012.

partners: if the retailer does not offer a given product, how much will this affect overall profits? Only a small number of roasters produce Fair Trade-certified coffee, Fair Trade buyers probably have lower price elasticity, and offering Fair Trade-certified products positively affects the general image of the supermarket. These elements are consistent with the retailer having less market power, i.e. lower deviation payoffs, for Fair Trade-certified products than for conventional coffee, which in turn explains the observed reduction of the retailer's profit margin to the benefit of the roaster.

This study concentrates on the mainstream retail market for ground coffee. The analysis is likely not to apply to specialty coffee, which I assume are not captured in my data set of US supermarkets selling major national coffee brands. In world stores and alternative trading schemes, different value chain structures may apply.

Some coffee is processed into instant coffee or caffeine powder as input for other products, while some is sold as brewed coffee in catering, but this study does not consider these markets.

Moreover, the time period studied is driven by data availability and certainly not ideal. The years 2011 and 2012 were marked by relatively high coffee commodity prices. The higher the commodity prices, the lower the relative producer price premium for Fair Trade-certified coffee. Indeed, our producer price premium estimate of around \$0.24 per lb is very close to the minimum defined by the Fair Trade social premium. When international prices are below the Fair Trade minimum price, as for example in 2016 or 2018, the effective producer price premium automatically rises. Moreover, the produced quantities and market share of Fair Trade-certified coffee have sharply increased between 2012 and the publication of the study. Further research should evaluate if this evolution changed relative bargaining power along the value chain.

Given the limited amount of reliable information on actual costs, the assumptions taken in this study are difficult to test and the profit margins have to be interpreted with caution. It would be interesting to establish empirical evidence on the additional costs of Fair Trade certification.

6 Conclusion

This study asks how much the consumer pays extra for Fair Trade certification on coffee in US supermarkets and how this premium is distributed among the participants of the coffee value chain. The estimates for the retail price premium range between \$1.10 per lb and \$2.03 per lb, depending on the control strategy, with estimates averaging around \$1.50 per lb. The wholesale price premium for Fair Trade-certified coffee is between \$1.16 and \$2.54 per lb and the producer price premium between \$0.21 and \$0.24 per lb.

Taking assumptions on the similarity of variable costs between Fair Trade-certified and conventional value chains, one can interpret these results on price premiums as indicating

differentials in profit margins. The largest portion of the Fair Trade price premium goes to the roaster who creates the brand value. The estimates suggest that retailers make *less* profit on Fair Trade-certified coffee than on conventional. This result suggests that the Fair Trade certification provides market power to the roaster, relative to the retailer. The relatively strong market position of roasters of Fair Trade-certified might be explained by the small number Fair Trade-certified roasters and the positive externality that offering Fair Trade-certified products may have on the reputation of the retailer.

This study concentrates on mainstream Fair Trade-certified and conventional brands which is use very similar value chains and identical retail outlets. This analysis can therefore not account for alternative trade arrangements, such as for example “world stores” and “direct trade” initiatives. Further research is needed to analyze value chains and profit-sharing in such alternative trade channels. No data on the negotiations between farmers, cooperatives and traders has been used and therefore the profit-sharing between these agents remains unclear. Finally, the data period covers only a small portion of the recent rise of Fair Trade-certified coffee consumption. Moreover, longer periods with very low coffee commodity prices followed the time period analyzed in this study, and it remains unclear how the results apply beyond the studied time frame.

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Appendix

A Additional tables and figures



Figure 6: Fair Trade USA logo (used on the products in this study)

Source: Fair Trade USA (2019)

| | Only one type | Both Fair Trade and conven- tional | Difference | |
|----------------------------|------------------|---|------------|-----|
| Package size (in oz.) | 16.4 | 11.4 | 5.1 | *** |
| Retail price per unit | \$6.66 | \$7.47 | -\$0.82 | *** |
| Retail price per lb | \$7.08 | \$10.53 | -\$3.44 | *** |
| Wholesale price per unit | \$5.45 | \$6.01 | -\$0.56 | *** |
| Wholesale price per lb | \$5.59 | \$8.50 | -\$2.91 | *** |
| Cooperative price per unit | \$2.45 | \$1.86 | \$0.59 | *** |
| Cooperative price per lb | \$2.39 | \$2.61 | -\$0.22 | *** |
| Fair Trade-certified | 2.62% | 55.84% | -53.22% | *** |
| Organic | 0.01% | 6.91% | -6.90% | *** |
| Decaffeinated | 19.56% | 14.94% | 4.62% | *** |
| Observations | 1,778,459 | 96,273 | | |

Two-sided Welch t-test, unequal variances. Stars denote significance: *** means $p < 0.01$.

Table 6: Comparison of companies offering both Fair Trade-certified and conventional coffee and other companies (t-test)

Source: main data set with observations at UPC-week-store level, own computations.

| | Retail price per lb | | | Wholesale price per lb | | | Producer price |
|----------------------|----------------------|---------------------|----------------------|------------------------|---------------------|----------------------|--------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| Fair Trade-certified | 0.92*** (0.016) | 0.77*** (0.016) | 1.12*** (0.015) | 0.89*** (0.007) | 0.80*** (0.007) | 1.05*** (0.006) | 0.24*** (0.000) |
| Decaffeinated | | -0.07*** (0.016) | -0.02 (0.014) | | -0.15*** (0.007) | -0.11*** (0.006) | |
| Organic | | 1.08*** (0.026) | -0.22*** (0.026) | | 0.51*** (0.012) | -0.41*** (0.011) | 0.35*** (0.000) |
| Vol (lb) | 0.28 (0.821) | 7.12*** (0.839) | -50.03*** (0.879) | -2.77*** (0.374) | -0.3 (0.381) | -38.79*** (0.356) | |
| Vol (lb) squared | -4.40*** (0.564) | -7.98*** (0.569) | 27.13*** (0.585) | -2.65*** (0.257) | -3.97*** (0.259) | 19.86*** (0.237) | |
| Constant | 13.03*** (0.347) | 9.95*** (0.357) | 33.06*** (0.370) | 10.08*** (0.158) | 9.01*** (0.162) | 24.63*** (0.150) | 1.73*** (0.001) |
| Market FE | Yes | Yes | Yes | Yes | Yes | Yes | No |
| Week FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Company FE | No | No | Yes | No | No | Yes | No |
| N | 96,273 (all columns) | | | | | | |
| R2 | 0.30 | 0.31 | 0.43 | 0.55 | 0.57 | 0.71 | 0.99 |

Stars denote significance: *** means $p < 0.01$.

Table 7: Regression results, keeping only companies offering both Fair Trade-certified and conventional coffee, analogously to the results in Table 4 and 5

Source: main data set keeping only the companies offering both Fair Trade-certified and conventional coffee with observations at UPC-week-store level, own computations.

B More detail on data selection

The main data set contains only the products and markets for which I have both wholesale and retail prices. The two data sets have different geographical coverage. The IRI retail data contains 50 regional markets, but only 38 of them could be matched to the Price-Trak wholesale data. For comparability, I only keep ground coffee, dropping UPCs that refer to instant coffee, whole beans and single-serve coffee pods. As we are interested in the comparison of Fair Trade and conventional products, I further drop the states for which no Fair Trade products could be matched, reducing the number of regional markets to 21.

For the year 2012, for example, matching dramatically reduces the number of different products by 90% (from 3,037 to 284 UPCs), but these matched UPCs have a cumulated market share of 37%. This means that popular products with high market shares are over-represented in the resulting data set. Table 8 gives a further overview of the selection arising from keeping only matched observations. The matched products are slightly cheaper (\$0.43 difference): this confirms that the matching keeps the cheap mainstream products and drops more expensive small brands. The matched products have slightly larger package sizes (1.7 ounce difference) and are more often decaffeinated (18% vs. 16%). The share of Fair Trade-certified products is similar with 3.15% in the matched sample and 3.12% in the remaining IRI observations. All of these differences are statistically significant, due to the large sample size, but their magnitude seems reasonably small.

| | Matched (=Kept) | Dropped | Difference | |
|-----------------------|--------------------|------------|------------|-----|
| Package size (in oz.) | 17.0 | 15.3 | 1.7 | *** |
| Retail price per unit | \$6.66 | \$7.09 | -\$0.43 | *** |
| Retail price per lb | \$6.93 | \$8.34 | -\$1.41 | *** |
| Fair Trade-certified | 3.15% | 3.12% | 0.02% | ** |
| Decaffeinated | 17.92% | 15.71% | 2.21% | *** |
| Observations | 3,187,863 | 15,400,000 | | |

Two-sided Welch t-test, unequal variances. Stars denote significance: *** means $p < 0.01$, ** means $p < 0.05$.

Table 8: Data selection from matching IRI data and Price-Trak data (t-test)

Source: full IRI data set with observations at UPC-week-store level, own computations.

The data is available from 2001 to 2012, but only very few products are Fair Trade-certified in the early years. For a long time, Fair Trade-certified coffee was sold in specialized “world shops” which might explain why I have no Fair Trade-certified observations until 2009 in the matched sample. In 2009, only two UPCs are Fair Trade-certified, so I restrict the analysis to the most recent years from 2010 to 2012. Even in this restricted data set, the Fair Trade market share rises quickly and most Fair Trade-certified sales occur in 2012.