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Who Benefits from Fairtrade? Evidence from the Swedish Coffee Market[1]

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Abstract

This paper analyses how the premium customers pay for Fairtrade-labelled coffee is distributed in the Swedish market, using information on costs of production and scanner data on almost all roasted and ground coffee products sold by retailers. A key finding is that roasters and retailers get 43–70%, while producer countries, in this paper comprising coffee farmers, cooperatives, middlemen, exporters and Fairtrade International, get 24–51%. Fairtrade Sweden gets 5–8%. These values are upper and lower bounds that reflect assumptions made about the additional costs of producing roasted and ground Fairtrade coffee, given the cost of beans and the Fairtrade license, and whether conventional coffee is compared with organic or non-organic Fairtrade coffees. Since roasters' and retailers' margins are higher for Fairtrade than conventional coffee, there is evidence that Fairtrade retail prices are higher than the level attributable to costs. However, producer countries receive a significantly larger share of the premium paid than reported in earlier studies, which are either dated or analyse very small samples of coffees.

Keywords: coffee supply chain, ethic labels, Fair Trade, extra price, Fairtrade, market power, organic coffee

JEL Codes: D43, O19, P46

[1] This is a substantially revised version of the paper "Are Fairtrade Prices Fair? An Analysis of the Distribution of Returns in the Swedish Coffee Market", S-WoPEc No 615.

1. Introduction

The sales of Fairtrade-certified goods are increasing rapidly and reached EUR 7.3 billion in 2015. Coffee, the first product to be certified, accounts for about 25% of the value of Fairtrade retail sales, and currently there are over 800 000 Fairtrade coffee farmers (Fairtrade International, 2017a; 2017b). The overall goal of Fairtrade is to ensure that farmers get a fair price and terms of trade that allow them to improve their lives (Fairtrade International, 2017c). Over the years, a number of studies have evaluated whether farmers benefit from Fairtrade, with varying results.[2]

Several papers analyse consumers' willingness to pay a premium for sustainability-certified products. Although the findings vary with type of consumer and origin of the product, there is overwhelming evidence that many people are willing to pay considerably more for Fairtrade-certified products (Basu and Hick, 2008; Hertel et al., 2009, Carlsson et al., 2010; Howard and Allen, 2010; Hiscox et al., 2011; Andorfer and Liebe, 2012; Van Loo et al., 2015; Hainmueller et al., 2015; Basu et al., 2016). Some of these studies use real-life experiments. One example is Hiscox et al. (2011), who, by setting up eBay auctions with products that are identical except for the Fair Trade[3] label, show that US consumers are willing to pay approximately 23% more for Fair Trade coffee. Thus, Fairtrade certification has the potential to increase market efficiency by creating a product that consumers are willing to buy, i.e. coffee combined with (perceived) decent incomes and working conditions for poor farmers (Reinstein and Song, 2012; Dragasanu et al., 2014; Podhorsky, 2015). Without the certification, the label and the subsequent monitoring (and a presumed positive effect on farmers), the market for Fairtrade products would not exist.

The argument that Fairtrade increases market efficiency hinges on assumptions about roasters' and retailers' limited market power (Reinstein and Song, 2012; Podhorsky, 2015).

[2] Nelson and Pound (2009) conclude that Fairtrade producers enjoy higher returns and more stable incomes compared with others. Dragusanu et al. (2014) agree but note that the empirical evidence is based primarily on conditional correlations, while Mohan (2010), Blackman and Rivera (2011) and Dammert and Mohan (2015) argue that there is a lack of persuasive evidence that coffee certification provides significant economic benefits. Recent empirical studies on the impact of Fairtrade on coffee farmers are Weber (2011), Jena et al. (2012), Dragusanu and Nunn (2014), Chiputwa et al. (2015), de Janvry et al. (2015), Minten et al. (2015) and Nelson et al. (2016). Their findings are mixed, yet none of them report strong positive average effects on income and other indicators of standard of living.

[3] I use the term Fairtrade when referring to the certification and labelling system governed by Fairtrade International. The term Fair Trade is used to refer to the fair trade movement as a whole and to products certified by the organization Fair Trade USA.

However, several papers claim that the lion's share of the premium paid for Fairtrade coffee accrues to roasters or retailers, and that the bean-exporting country receives as little as 10% or less (Mohan, 2010; Griffiths 2012, 2015; Hartford, 2012, p. 37; Claar and Haight, 2015). If correct, Fairtrade has created a product that mainly benefits roasters and/or retailers as they exploit their market power and set high prices.

In spite of these claims, few studies provide empirical evidence on the price paid for Fairtrade coffee in consumer markets, and no one attempts to estimate the total additional cost of producing Fairtrade relative to ordinary coffee. To the best of my knowledge, only four published papers actually measure the premium paid and provide some information about how it is distributed (Mendoza and Bastiaensen, 2003; Kilian et al., 2006; Johannessen and Wilhite, 2010; Valkila et al., 2010).[4] It is important to note that Mendoza and Bastiaensen (2003) and Kilian et al. (2006) analyse data from the 1990s and early 2000s, when Fairtrade coffee was mostly sold in special shops and its market share was tiny (Fairtrade Foundation, 2012). Since there has been a rapid expansion in sales of Fairtrade coffee and a shift to grocery chains, these studies are probably no longer relevant (Smith, 2009; Mohan, 2010, pp. 52–55). While the other two studies use more recent data, Johannessen and Wilhite (2010) analyse one Fairtrade coffee sold in retail outlets and Valkila et al. (2010) compare a few popular conventional coffees with two Fairtrade coffees. Thus, no study analyses a representative sample from a market where large companies produce Fairtrade coffees and grocery chains sell them.

The purpose of the present paper is to analyse how the premium paid by consumers for Fairtrade coffee is distributed in the Swedish market. It differs from earlier studies by providing estimates of how much of the premium paid for Fairtrade coffee is captured by roasters and retailers when their costs, though indirectly, are accounted for. Moreover, by analysing practically all coffee products sold during the study period and controlling for various factors that affect prices, sample selection problems are reduced.

Coffee retail markets in developed countries share many characteristics, so the Swedish market should be representative at least of those in northern Europe. Most developed country

[4] In her review of Fairtrade, Mohan (2010) refers to Potts (2004), Weber (2007) and Sellers (2005), but none of these studies provide any evidence on the premium paid for Fairtrade coffee by comparing prices. Griffiths (2012) reports data from a British café. However, these data are not relevant for retail markets.

consumer markets, a few multinational and national roasters have a very large share of the market (60–85%), while many small roasters compete for the rest (Oxfam, 2002; Durevall, 2003; Sutton, 2007). Food retailing is usually even more concentrated than coffee processing (Bukeviciute et al., 2009; McCorriston, 2013). In for example Sweden, the three largest grocery chains account for well over 90% of all sales (Swedish Competition Authority, 2011).

In Sweden, Fairtrade coffee has a market share of 10% (Fairtrade Sweden, 2016), which is similar to the figure in several other countries (Krier, 2008; Elliot, 2012). Today, both large- and small-scale roasters produce Fairtrade coffee and primarily sell it through grocery chains, so Fairtrade and conventional coffees have the same supply chains after the beans have reached the importing countries. Consequently, Fairtrade coffee is an integrated part of the mainstream coffee retail market.

I use scanner data at the barcode (EAN) level for all roasted and ground coffee products, collected by the Nielsen company from over 3 000 Swedish grocery shops, as well as information about costs in order to measure how the premium paid for Fairtrade coffee is distributed. First I estimate representative average Fairtrade and conventional coffee retail prices by regressing retail prices on a range of product characteristics, i.e. I estimate hedonic regressions. Then I calculate the distribution of shares using the estimates of average retail prices, the difference in margins on sales of Fairtrade and conventional coffee, costs of Fairtrade and conventional beans, and Fairtrade licence costs, while assuming rather extreme maximum and minimum additional costs related to the production of Fairtrade coffee compared with conventional coffee. This makes it possible to distinguish between three groups of actors: *producer countries*, i.e. coffee farmers, cooperatives, middlemen, exporters and Fairtrade International; *roasters and retailers*, in this paper comprising importers, roasters and retailers in Sweden; and *Fairtrade Sweden*, which manages the certification of roasters and other related activities in Sweden. The analysis also provides estimates of government income from value added tax (VAT), but they are small and uncertain and not explicitly reported.

The main finding is based on a comparison of roasted and ground non-organic conventional and non-organic Fairtrade coffees. Out of the premium paid for Fairtrade coffee, net of VAT and additional costs, roasters and retailers get 61% when additional costs are assumed to be SEK 5/kg (about USD 0.70) higher for Fairtrade coffee than for conventional coffee, given

the cost of Fairtrade beans and the Fairtrade licence, and 70% when the costs are assumed to be the same. Producer countries get 31% or 24%, respectively, and Fairtrade Sweden gets 8% or 6%. A difference of SEK 5/kg in costs is an extreme assumption and therefore generates a very low lower bound of the share going to roasters and retailers. After all, there are no obvious differences in the marginal cost of production between Fairtrade and conventional roasted and ground coffee, since both are produced by both small and large roasters.

I lack systematic information about prices of conventional organic green beans, so I compare roasted and ground non-organic conventional and organic Fairtrade coffees, i.e. the combined effect of the Fairtrade and organic labels. This results in somewhat smaller figures for roasters and retailers: 43% when an SEK 5/kg difference is assumed and 53% without a difference, while the producer country gets 51% or 42%, respectively. The larger shares going to producer countries are due to the relatively high Fairtrade social premium on organic beans and the small impact of the organic coffee label on the retail price. Nonetheless, in a competitive market, roasters' and retailers' margins would be similar for Fairtrade and conventional coffee, so their share of the premium paid for Fairtrade coffee would be close to zero. Thus, the Fairtrade label seems to create a product that roasters and retailers can use to exploit their market power.

Another finding is that the share of the premium consumers pay for Fairtrade, i.e. the difference between Fairtrade and conventional coffee retail prices, which goes to the producer countries is 22% for non-organic coffee and 40% for organic coffee. These figures are clearly higher than the 11.5% reported by Valkila et al. (2010). The value share, i.e. the price paid for beans used to produce 1 kg of ground coffee as a share of the retail price, is 50% for conventional coffee and 43% or 46% for Fairtrade non-organic and organic coffee, respectively, which can be compared with 35% for the two Fairtrade coffees in Finland (Valkila et al., 2010) and 26% for the Fairtrade coffee in Norway (Johannessen and Wilhite, 2010). Thus, while Fairtrade retail prices are high compared with costs, producer countries receive a substantially larger share of the difference between Fairtrade and conventional coffee retail prices than reported in earlier studies (Mendoza and Bastiaensen, 2003; Kilian et al., 2006; Johannessen and Wilhite, 2010; Valkila et al., 2010) and often used when discussing Fairtrade (Mohan, 2010; Griffiths 2012, 2015; Hartford, 2012, p. 37; Claar and Haight, 2015). Nonetheless, the shares roasters and retailers obtain are large compared with

what farmers are likely to get, which is just a small part of the producer country's share, casting doubt on the market efficiency argument, as stated by Reinstein and Song (2012) and Podhorsky (2015).

The next section briefly reviews earlier research on Fairtrade retail prices. Sections 3 and 4 describe the data and method, respectively. Section 5 reports the regression results, while Section 6 calculates the allocations of the Fairtrade returns. Section 7 concludes the paper.

2. Earlier Research

A vast number of papers on Fairtrade have been written, but very few analyse consumer prices. A recent study is Johannessen and Wilhite (2010), who analyse 2006–07 data for a Fairtrade coffee sold in retail stores in Norway: Farmers' Coffee from Guatemala. They find that, out of the final consumer price, the retailer gets 13.8%, the Fairtrade certifier 2.4% and the importer/roaster 58.2%. This implies that 74.4% of the value stays in Norway while 26.6% ends up in Guatemala. There is no information about production costs, VAT etc. and no comparison with prices of conventional coffee, so we cannot say anything about the premium paid for Fairtrade coffee or how it was distributed.

Valkila et al. (2010) compare the prices in 2006-09 of the two most popular Fairtrade coffees with those of the four most popular conventional coffees sold by a large retail chain in Finland. They find that 35% of the Fairtrade consumer price goes to the bean producer country and 60% stays in Finland; the other 5% are for licence fees and transport costs. The producer country receives EUR 1.30 for 1 kg of Fairtrade coffee and EUR 1.15 for 1 kg of conventional coffee, which implies that 11.5% of the premium paid by consumers for Fairtrade coffee reaches the producer country.

Kilian et al. (2006) report US and European data on conventional, organic and Fairtrade/organic coffee in graphs.[5] There are three noteworthy findings, particularly in Europe. First, there is a relatively small difference in prices charged by roasters for the three studied categories of coffee, indicating that the production costs are similar. Second, retailers increase the price of organic and organic Fairtrade coffee by about 100%, while the markup

[5] Kilian et al. (2006) do not present any details about their study but refer to a report that I have not managed to obtain.

on conventional coffee is only 15–20%. Third, there is almost no difference in the consumer prices of organic and Fairtrade/organic coffee, indicating that the premium paid for Fairtrade is small. Rough estimates based on the graphs indicate that about 15% of the difference in price between conventional and Fairtrade/organic coffee went to the producer country. However, this was almost all due to the high price on organic coffee. These findings might be due to the study period, which largely pre-dates the sale of Fairtrade coffee by grocery chains.

Mendoza and Bastiaensen (2003) compare the costs for one conventional and one Fairtrade instant coffee in the UK in 1996 and 2003. In 1996, the producer price for green beans was similar for conventional and Fairtrade coffee, while the consumer price was 40% higher for Fairtrade than for conventional coffee. Only 4.5% of the premium paid for Fairtrade coffee went to the producer country. World market bean prices declined sharply after 1996, but the impact on Fairtrade coffee bean prices was small. As a result, the share going to the producer country increased to 19%.

There are also some studies that estimate hedonic models, focusing on the size of the Fairtrade premium only; Wang (2016) provides a brief review. There is one study on Sweden, Schollenberg (2012), who uses Nielsen data for March 2005–March 2008. A Fairtrade label raises the price by 32% when controlling for a range of factors that influence prices, including brands. A drawback of the study is that by controlling for practically all brands, several of which have Fairtrade coffees, it is not clear what Fairtrade products the 32% applies to.

Thus, there is some limited evidence that importers, roasters and/or retailers charge high prices for Fairtrade coffee and keep a large part of the price difference. However, most studies use data from a period when Fairtrade coffee sales were much lower than today. Such sales are estimated to have grown by about eight times from 2000 to 2012 (Fairtrade Foundation, 2012), and therefore, increases in competition might have eroded price differences, as claimed by Smith (2009). Moreover, apart from Kilian et al. (2006), which uses old data, the studies focus on a small selection of products, which might amplify the impact of differences in quality. For example, the conventional coffees studied by Valkila et al. (2010), i.e. the most popular ones, are likely to have low prices, so the benchmark used for conventional coffee might be biased downwards. Thus, the studies may suffer from severe selection bias (Elliott, 2012).

3. Data

The data on coffee products are from weekly sales in 3 088 Swedish grocery shops from 1 March 2009 to 26 February 2012, collected at the barcode level by the Nielsen company. They include values and volumes of all coffee products sold as well as information about types of coffee and various product characteristics, such as manufacturer, type of roast, size of package, organic, Fairtrade, and private label (retailer-owned brand). I measure retail prices as value divided by volume averaged over the sample period and grocery shops (Nielsen does not provide information from the individual grocery shops in Sweden). I focus on roasted and ground coffee, as this is by far the largest market segment, accounting for 80% of all coffee sales in value terms according to the Nielsen data. Instant coffee, which accounts for 11% of the sales, is more challenging to analyse due to the small number of Fairtrade products and larger scope for using cheap beans.[6]

Table 1 provides price information on the 188 ground coffee products available in packages of 250 g, 400–499 g and 500 g. There are 22 organic Fairtrade and 12 organic non-Fairtrade products. Both the mean and median prices of organic Fairtrade coffee are relatively high, 30–40% higher than for conventional coffee. This is partly due to the low prices of conventional coffee at the lower end of the price scale, i.e. the minimum price is SEK 30 compared with SEK 69 for Fairtrade coffee while the maximum price for conventional coffee is only SEK 10 lower than for Fairtrade coffee. The price difference is probably due to the Fairtrade label since organic non-Fairtrade coffee is only slightly more expensive than conventional coffee. There are 3 non-organic Fairtrade coffee products. They are in the 250 g segment, which is very small; it only accounts for 0.5% of total sales of ground and roasted coffee. The prices of the three non-organic Fairtrade coffees also differ greatly and are therefore not useful for estimating representative Fairtrade coffee prices (see Appendix A).

There are two sources of information about green bean prices: International Coffee Organisation (ICO) and Statistics Sweden. ICO publishes daily world market prices for various types of green coffee beans. I used these prices and information on the volume of imports of green beans to construct an index with weights based on the type of Arabica beans imported (ECF, 2014). Statistics Sweden publishes monthly volumes and values of imports of

[6] I did analyse instant coffee and the results are available on request. They are qualitatively similar to the ones reported for ground coffee.

green beans. The average bean prices obtained from the two sources are very similar, SEK 29.15 and 29.72/kg for March 2009–February 2012. The difference is probably due to quality differences and additional freight and insurance costs for delivery to Sweden. Converting the freight and insurance costs used by Valkila et al. (2010) from EUR to SEK gives a cost of SEK 0.85/kg for transporting green beans from Latin America to Finland, so the SEK 0.57 difference between Statistics Sweden and ICO prices makes sense; ICO prices are for delivery to the US, France or Germany. Because the difference in the prices is small, the choice of data source does not matter for the results. In the calculations, I use prices based on import data from Statistics Sweden.

The current Fairtrade (minimum) bean price is 140 US cents per pound for washed Arabica, 135 US cents per pound for natural Arabica, and 101 US cents per pound for Robusta. On top of those prices, Fairtrade requires buyers to add a social premium of 20 US cents per pound to the price of conventional coffee beans and another 30 US cents for certified organic coffee beans (Fairtrade Foundation, 2012). Because world market prices were higher than Fairtrade minimum prices during the study period, I added the Fairtrade social premiums to world market prices to obtain the prices paid for Fairtrade coffee beans.[7] Most Fairtrade coffee sold in Sweden is organic, so Table 1 reports both Fairtrade and organic Fairtrade bean prices. Unfortunately, I do not have systematic information about organic non-Fairtrade bean prices.

The price of ordinary green beans was SEK 29.72/kg during the study period. Adding Fairtrade's social premium increases this figure to SEK 32.80/kg for Fairtrade beans and SEK 37.50/kg for organic Fairtrade beans. This means that Fairtrade and organic Fairtrade beans are 10% and 26% more expensive than ordinary beans, respectively.

Approximately 1.19 kg of green beans is used to produce 1 kg of ground coffee due to weight lost during roasting (ECF, 2014). When comparing green bean and ground coffee prices, it therefore makes sense to multiply bean prices by 1.19. Roasters thus pay SEK 35.37 for the beans used to produce 1 kg of ground conventional coffee. For Fairtrade coffee and organic Fairtrade coffee, the corresponding figures are SEK 39.03 and SEK 44.63.

We conclude that there are large retail price differences between conventional and Fairtrade coffee and that these are unlikely to be due to differences in bean prices only. However, the

[7] Before April 2011, the social premiums were 10 and 20 US cents, respectively.

comparisons ignore the fact that the coffees compared are not identical; many characteristics of the products affect price, such as size of packages and type of roasting.

4. Method

I calculate three measures of how the premium paid for Fairtrade coffee is distributed by comparing conventional and non-organic Fairtrade coffee, and conventional and organic Fairtrade coffee. The calculations aim to account for various costs, and are not complicated. However, there are several components, so here I give a somewhat simplified description of them by ignoring VAT and organic coffee; more details are provided in Appendix B.

The simplest and the most commonly used measure in studies on coffee prices is the value share; see e.g. Oxfam (2002), Talbot (2004) and Gilbert (2008). It compares the cost of beans with the retail price, and is defined here as:

$$(P_{Bi} - 0.85)/P_{Ri}\,, \qquad (1)$$

where P_{Ri} is the average retail price per kg of roasted and ground coffee, i is Fairtrade or conventional coffee, P_{Bi} is the cost of beans needed to produce one kg of ground coffee and SEK 0.85 is an estimate of the per-kg transport cost for beans, obtained from Valkila et al. (2010).

The second measure shows how the consumer premium, the difference between Fairtrade and conventional coffee retail prices, is divided between the producer and consumer countries. The producer countries' share of the premium is:

$$(P_{BF} - P_{BF})/(P_{RF} - P_{RC})\,, \qquad (2)$$

where $P_{BF} - P_{BC}$ is the difference between the cost of Fairtrade and conventional beans and $P_{RF} - P_{RC}$ is the difference in retail price between Fairtrade and conventional coffee. This measure is often reported when discussing Fairtrade consumer prices. It is estimated in some studies, such as Valkila et al. (2010), but not in Johannessen and Wilhite (2010), who do not use data on conventional coffee prices.

The third measure highlights the share going to roasters and retailers (retail chains in Sweden). It shows how the difference in Fairtrade and conventional coffee retail prices, net of VAT and costs, is distributed between roasters and retailers, Fairtrade Sweden, and producer countries. In contrast to the other two measures, it requires information about Fairtrade licence fees to process the coffee beans; a roaster needs a Fairtrade license in order to process the coffee beans. It also requires an analysis of how production costs differ between Fairtrade and conventional coffee, and how much VAT that is paid to government.

The total additional income from the sale of 1 kg of Fairtrade coffee, R_{FTR}, is measured as the sum of three components: the cost of Fairtrade beans minus the cost of conventional beans, the licence fee paid to Fairtrade Sweden and the difference in roasters' and retailers' margins on Fairtrade and conventional coffee, defined as $M_F - M_C$. The margin, M, is the retail price adjusted for VAT minus costs of producing ground coffee. Since I use the difference in margins, the only information about costs needed is the cost of beans, the licence fee paid to Fairtrade Sweden and the additional 'other cost' incurred when producing Fairtrade coffee instead of conventional coffee; all other costs are netted out by the use of differences. The share accruing to roasters and retailers is thus the difference in margins (excess margins for Fairtrade coffee) divided by the total additional income value from Fairtrade coffee retail sales:

$$(M_F - M_C)/R_{FTR}, \tag{3}$$

while the share accruing to the producer countries is:

$$(P_{BF} - P_{BC})/R_{FTR}. \tag{4}$$

I have information on the cost of beans, which is the main cost of production of ground coffee, and on applicable Fairtrade certification fees (paid by roasters) and VAT. It is possible that roasters' marginal cost of production is higher for Fairtrade than for conventional coffee, even after controlling for the cost of beans and fees, although coffee production is fairly straightforward and returns to scale are limited (Sutton, 2007). The value chains are the same for conventional and Fairtrade coffee in Sweden, but production costs might be higher for Fairtrade coffee due to administrative costs, if e.g. it is more challenging to source Fairtrade coffee beans of adequate quality or taste. To get a rough idea of the size of a potential difference in 'other costs' of production, I use annual data from Statistics Sweden on value

and volume of deliveries from Swedish roasters and the price of imported green beans.[8] The average wholesale delivery price in 2010–2011 was SEK 52/kg, while the import price of coffee beans was SEK 32/kg. The difference, SEK 20, is margin plus costs for roasting (including bean weight loss, which corresponds to SEK 6), packaging, transport to retailers etc. A difference in production costs between Fairtrade and conventional coffee of, say, SEK 5/kg should therefore be a very high upper limit. I use this as a measure of additional 'other costs' in the calculations, since it indicates a minimum value for the shares obtained by roasters and retailers.

One challenge when evaluating Fairtrade prices is that the quality might differ both between conventional and Fairtrade coffees and within each category (Elliot, 2012). Another challenge is that almost all Swedish Fairtrade coffees are organic, and the separate contributions of Fairtrade and organic beans to the price need to be disentangled. Therefore, I use regression analysis to estimate the average price paid for Fairtrade and conventional coffee, since it allows me to control for several product characteristics.

To identify the impact of a Fairtrade label on the price, I use the facts that not all organic coffees are Fairtrade and that the price of organically certified conventional coffee should be informative about the contribution of organic coffee labels to the price of organically certified Fairtrade coffee. The main analysis is restricted to coffees in 500 g packages. This is by far the most popular package size, making up 93% of all sales of roasted coffee in value terms according to the Nielsen data. In this market segment, all Fairtrade coffees are organic. However, to check for the robustness of the results, I also estimate models with various sub-samples (see Appendix A).

I also compare non-organic conventional coffee and organic Fairtrade coffee, which provides information about the distribution of shares without the need to separate the price effects of Fairtrade and organic labels. Ideally, organic Fairtrade coffee should be compared with organic conventional coffee, but there is a shortage of detailed information about prices for organic conventional beans, preventing such a comparison.

[8] Almost all deliveries recorded by Statistics Sweden are roasted and ground coffee since all instant coffee is imported to Sweden and retail sales of whole roasted beans make up only a tiny part of the coffee sold to consumers. Thus, almost all imported green beans are used to produce ground coffee. A small share of roasted coffee is exported, which I ignore.

5. How high are Fairtrade prices?

Table 2 reports OLS regressions on prices per kg of ground coffee in 500 g packages, using robust (sandwich estimator) standard errors. Product characteristics, aimed at capturing quality-related costs, are measured by dummy variables for type of roast (medium, dark and other), private label, decaffeinated, organic (not Fairtrade) and Fairtrade organic coffee (all 500 g Fairtrade coffees are organic). The dummies are not mutually exclusive: a small number of coffees with private labels are also organic and a few are both organic and Fairtrade. However, the inclusion of more dummy variables, such as non-Fairtrade-organic private label, does not affect the results (available from the author on request).

Specification (1) includes the 140 products for which there is data. The base category is ground medium-roast branded coffee with caffeine. The price of it is SEK 62.00/kg. The combined Fairtrade and organic labels add SEK 23.27/kg to the SEK 62.00/kg, while organic coffee labels by themselves add only SEK 6.14/kg. The estimate of the contribution of organic beans to the price is somewhat uncertain because it is only significant at the 10% level, but it is clearly much smaller than the SEK 17/kg (23.27 minus 6.14) contribution of the Fairtrade label.

Because the variable measuring Fairtrade coffee products includes only organic Fairtrade coffee, I re-estimate the model without Fairtrade coffee to focus on organic coffee (specification 2). The results are similar: organic beans add SEK 6.17/kg to the price. And to check the robustness of the result for the Fairtrade coffee, I then estimate a model with only organic coffee (specification 3). Now the base category is a 500 g package of ground medium-roast organic branded coffee with caffeine, priced at SEK 69.26/kg. There are only 24 observations, but the results are strong: the coefficient for Fairtrade coffee is highly significant (t-value = 5.25), showing that the Fairtrade label adds SEK 14.76/kg to the price of organic coffee. This is in line with the results obtained in the two other specifications. A medium-roast branded coffee with caffeine that is also Fairtrade but not organic would thus cost about SEK 77–79. This implies that the Fairtrade label increases the price of conventional coffee by about 25%.

All the control variables have expected signs. Private label coffee is about SEK 12 cheaper than branded coffee, and dark roast is SEK 5–7 more expensive. The ‘undefined roast’ is a

control variable that captures products without a type of roast identified on the package. Decaffeinated coffee is SEK 6 more expensive than conventional coffee, but the estimates are not significant due to the small number of observations.

To further check for robustness of the findings, I estimated models with five different samples: all 250 g, 400–499 g and 500 g packages; only 400–499 g and 500 g packages, which excludes several very expensive 250 g packages; the four roasters that dominate the Swedish market for ground coffee; only inexpensive coffees, i.e. coffees that cost less than SEK 100/kg; and only branded coffees. Although the coefficients of some of the product characteristics differ, the ones for organic and Fairtrade coffee are similar to the coefficients reported in Table 2 (see Table A1 in Appendix A).

6. Distribution of the premium paid for Fairtrade coffee

The purpose of this section is to calculate how much of the premium consumers pay for Fairtrade coffee that accrues to roasters and retailers, Fairtrade Sweden and producer countries. In addition, I calculate producer countries' share of the consumer premium and producer countries' value shares for Fairtrade and conventional coffee.

During the study period, the average Fairtrade social premium, i.e. the additional cost roasters pay for green Fairtrade beans, was SEK 3.11/kg on ordinary beans and SEK 7.11/kg for organic beans (see Table A2 in Appendix A). The certification fee paid by roasters was 1.5% of the consumer price in 2008 and 0.8% in 2013.[9] In the calculations, I use 1.5% (inclusive of VAT) of the consumer price (exclusive of VAT), which might be on the high side.

Because there is a time lag between the purchase of beans and the sale of processed coffee, I calculated average bean prices starting three and six months before the study period, as well as in March 2009. However, the price changes are small and the choice does not matter much. The price used in the calculations is the average price of imported green beans for January 2009–November 2011.

Table 3 reports the results for ground coffee in 500 g packages. Consumer prices are from Table 2, specification (1), where I control for product characteristics. They are SEK 62 for

[9] Personal communication with Morgan Zerne, CEO of Fairtrade Sweden.

conventional coffee and SEK 79 for Fairtrade coffee. Out of the premium paid for 1 kg of Fairtrade coffee, producer countries and Fairtrade Sweden get SEK 3.70 and 0.95/kg, respectively. When I assume that 'other costs' are zero, the roasters' and retailers' margin is SEK 11.10/kg higher for Fairtrade than conventional coffee. The total additional value of Fairtrade sales is thus SEK 15.75/kg, of which 24% accrues to producer countries, 70% to roasters and retailers and 6% to Fairtrade Sweden. If we instead assume that 'other costs' are SEK 5/kg higher for Fairtrade than conventional coffee, the share for producer countries increases to 31% and the share for roasters and retailers decreases to 61%.

Table 3 also reports how large the difference in 'other costs' needs to be to completely erode roasters' and retailers' margin; it is SEK 14.80/kg. In this hypothetical case, roasters' and retailers' margins are the same for conventional and Fairtrade coffee, and producer countries' share is 80%.

Table 4 reports calculations with conventional coffee and organically certified Fairtrade coffee using Fairtrade's premium on organic green coffee beans. When there is no difference in 'other costs', producer countries receive 42% and rosters/retailers 53%, and when there is an SEK 5/kg difference, producer countries receive 51% and rosters/retailer 43%. Fairtrade Sweden gets 5% and 6%, respectively.

The producer countries' share of the premium, i.e. the difference between Fairtrade and conventional retail prices, is 22% when non-organic coffees are compared (Table 3) and 40% when the non-organic conventional coffee is compared with organic Fairtrade coffee (Table 4). The large share for organic Fairtrade coffee is due to the combination of a relatively large social premium on organic green Fairtrade beans and a relatively small price effect of the organic label. Producer countries' value shares, the price of beans as a percentage of retail prices, are about 50% for conventional coffee and 46% and 43% for organic and non-organic Fairtrade coffee, respectively.

7. Discussion and Conclusion

Consumers pay a premium for Fairtrade coffee, most likely assuming that it mainly benefits poor coffee farmers (Koppel and Schulze, 2013). Yet, several authors claim that almost the entire difference between Fairtrade and conventional coffee retail prices is kept by importers,

roasters and retailers (Mendoza and Bastiaensen, 2003; Kilian et al., 2006; Johannessen and Wilhite, 2010; Mohan, 2010; Valkila et al., 2010; Griffiths 2012, 2014, 2015; Hartford, 2012, p. 37; Claar and Haight, 2015). However, the empirical evidence for this claim is weak. Most studies are based on comparisons of a small number of selected coffees, not representative samples, and few of them have been published. Several studies are also dated, and defenders of Fairtrade argue that the rapid growth of Fairtrade coffee sales has increased competition and reduced premiums (Smith, 2009).

This paper analyses how the premium paid by consumers for Fairtrade coffee in the Swedish coffee market is distributed between three groups: coffee producer countries; importers, roasters and retailers; and the organisation managing the certification of roasters, Fairtrade Sweden. Scanner data for everyday sales of coffee in 3 088 outlets across Sweden are used to estimate price differences between conventional and Fairtrade-certified roasted and ground coffee, while controlling for product characteristics. Information about green bean prices, Fairtrade certification fees and VAT, as well as assumptions about additional costs of producing roasted and ground Fairtrade coffee, are then used to calculate extreme maximum and minimum values of the distribution of the shares.

Comparing non-organic conventional and Fairtrade coffee, and assuming it costs SEK 5/kg (USD 0.70) more to produce Fairtrade than conventional coffee (which is a very high value), importers, roasters and retailers get 61% of the premium, while assuming that the costs are the same increases their share to 70%. Producer countries receive 31% or 24% and Fairtrade Sweden 8% or 6%, respectively. These percentages can be considered lower and upper bounds. Comparing non-organic conventional coffee and organic Fairtrade coffee gives a more favourable result for producer countries; they receive 51% or 42% and roasters and retailers receive 43% or 53%, depending on the assumption about additional costs. The reason the shares differ from the comparison of non-organic coffee is that Fairtrade's social premium on organic beans is high compared with the social premium on ordinary beans, and that the increase in price related to the organic coffee label is small.

Earlier studies focus either on how the difference between Fairtrade and conventional coffee retail prices is allocated between producer and consumer countries, ignoring costs of production and VAT, or on the export price as a share of the retail price, i.e. the value share. I find that producer countries get 22% of consumer premium on Fairtrade measured as the

difference between Fairtrade and non-organic conventional coffee prices, and 40% of the consumer premium measured as the difference between organic Fairtrade and non-organic conventional coffee prices. This is clearly more than the 11% or less found in other studies (Valkila et al., 2010). The value shares are 50% for conventional coffee and 46% and 43% for organic and non-organic Fairtrade coffee, respectively. Some other recent estimates are 26% for a Fairtrade coffee brand in Norway (Johannessen and Wilhite, 2010) and 35% for a selection of Fairtrade coffees in Finland (Valkila et al., 2010). The most likely reason I obtain higher values than earlier studies is that I analyse a national sample of coffees, not just a few products, and control for product characteristics.

Nonetheless, a key finding is that the margins for Fairtrade coffee are clearly higher than for conventional coffee. This is an indication of market power in the Swedish consumer coffee market. Large national and multinational roasters sell Fairtrade coffee, and they are generally believed to have market power due to their large market shares, in Sweden and elsewhere (Talbot, 2004; Gibbon, 2005; Nakamura and Zerom, 2010), though earlier research on the Swedish coffee market has not found persuasive evidence in this direction (Durevall, 2007; Gilbert, 2008). Moreover, three large grocery chains dominate the Swedish retail food market. With market power, roasters and retailers can charge prices that more than compensate for additional Fairtrade costs. As a consequence, the demand for Fairtrade coffee beans is kept down by high prices, indirectly affecting the income of poor farmers. Therefore, Fairtrade seems to provide roasters and retailers with a new product that earns monopoly rents.

A shortage of Fairtrade beans, at least of beans of sufficiently good quality, is an alternative explanation for the high Fairtrade retail prices. Although there arguably have been periods when some roasters have had difficulties sourcing adequate Fairtrade beans, this is unlikely to be a general phenomenon. In fact, most Fairtrade-certified cooperatives sell only a part of their coffee beans as Fairtrade, as there is excess supply (de Janvry et al., 2015).

Fairtrade critics have suggested that consumers should donate money to coffee farmers (supposedly via some institution) instead of buying Fairtrade coffee (Leclair, 2002; de Janvry et al., 2015; Claar and Haight, 2015). Dragusanu et al. (2014) disagree, arguing that it is better to use market-based mechanisms because direct transfers of money to farmers tend to distort incentives and spur rent-seeking and corruption. This is also shown by Reinstein and Song, (2012) and Podhorsky (2015) by, respectively, developing models with information

asymmetries and market power. However, they also show that when rosters' and retailers' margins are large relative to farmers' benefits, which the results of this study indicate to be the case, when combined with the results of recent studies of the supply side and the impact of Fairtrade on coffee farmers,[10] it might be more efficient to use direct transfers instead of relying on the Fairtrade system. Although further research is needed, the suggestion to use donations is unlikely to have much policy relevance, since Fairtrade is a well-known organisation with a well-established label. A better strategy would be to improve the functioning of the Fairtrade system. One suggestion is that roasters should declare openly on packages how much that goes to Fairtrade cooperatives (Griffiths, 2010). This would probably be unattractive to most roasters, but it could be adopted by those seriously engaged in Fairtrade, increasing their market shares and boosting competition in the Fairtrade coffee market.

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[10] See, for example, Weber (2011), Jena et al. (2012), Dragusanu and Nunn (2014), Chiputwa et al. (2015), de Janvry et al. (2015), Minten et al. (2015) and Nelson et al. (2016).

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Table 1. Ground coffee and bean prices, March 2009–February 2012 (USD 1 = SEK 7)

Ground coffee	Number	Mean	Median	Min	Max
Conventional	151	71.20	64.08	30.00	175.93
Fairtrade organic	22	107.16	90.80	69.32	185.71
Fairtrade not organic	3	121.00	95.00	82.00	186.00
Organic, not Fairtrade	12	71.69	67.54	41.02	129.44

Green beans	Ordinary	Fairtrade	Organic Fairtrade
Import price 1 kg of green beans	29.72	32.80	37.50
Cost of producing 1 kg roasted coffee	35.37	39.03	44.63

Note: The sample includes products in 250 g, 400–499 g and 500 g packages. Coffee products priced at SEK 10/kg or less have been excluded since they are only sold in large quantities. The green bean import price is from Statistics Sweden, calculated as value of imports in SEK divided by volume of imports. The price paid for beans to produce 1 kg of coffee is based on the requirement to use 1.19 kg of beans due to weight lost when roasting (ECF, 2014).
Sources: Own calculations based on data from the Fairtrade Foundation (2012), Nielsen Sweden and Statistics Sweden.

Table 2. OLS regression on average price per kg of ground coffee (500 g packages)

	(1) All products	(2) No Fairtrade	(3) Only organic
Dark roast	5.05	4.78	7.54
	(1.97)*	(1.68)*	(3.99)***
Undefined roast	17.45	17.333	-5.07
	(1.85)*	(1.84)*	(1.62)
Decaffeinated	6.40	6.31	
	(0.31)	(0.30)	
Private Label	-11.55	-11.70	-9.72
	(4.96)***	(4.76)***	(2.61)**
Fairtrade organic	23.27		14.76
	(11.90)***		(5.25)***
Organic, not Fairtrade	6.14	6.17	
	(1.74)*	(1.75)*	
Constant	62.00	62.14	69.26
	(26.03)***	(25.18)***	(22.09)***
R^2	0.29	0.20	0.80
N	140	127	24

Note: Average price for 1 March 2009–26 February 2012. Robust standard errors are used. * $p<0.1$; ** $p<0.05$; *** $p<0.01$. USD 1= SEK 7.

Table 3. Distribution of premium paid for Fairtrade roasted and ground coffee, in SEK/kg (500 g packages)

Measure	Definition	Conventional coffee	Fairtrade, other costs = SEK 0	Fairtrade, other costs = SEK 5	Fairtrade, other costs = SEK 14.80
Retail price	P_{Ri}	62.00	79.12	79.12	79.12
Cost of beans (inclusive of VAT and weight lost)	$P_{Bi} = P_{impi}(1.12)(1.19)$	37.95	42.09	42.09	42.09
Difference in 'other costs' (assumed)	P_{OCi}	0.00	0.00	5.00	14.80
Producer countries' income	$0.893(P_{BF} - P_{BC})$	-	3.70	3.70	3.70
Fairtrade Sweden's income	$P_{FTC} = 0.893\left(0.015\left(P_{RF}/1.12\right)\right)$	-	0.95	0.95	0.95
Roasters/retailers' excess margin	$M_F - M_C$	-	11.10	6.64	0.00
Total additional income from Fairtrade sales	R_{FTR}	-	15.75	11.29	4.65
Producer countries' share	$\left[0.893(P_{BF} - P_{BC})\right]/R_{FTR}$	-	24%	31%	80%
Fairtrade Sweden's share	$\left(0.893P_{FTC}\right)/R_{FTR}$	-	6%	8%	20%
Roasters'/retailers' share	$\left[(M_F - M_C)\right]/\left[R_{FT} + (P_{NF} - P_{NC})\right]$	-	70%	61%	0%
Sum of shares		-	100%	100%	100%
Producer countries' share of consumer Fairtrade premium	$0.893(P_{BF} - P_{BC})/(P_{RF} - P_{RC})$	-	22%	22%	22%
Producer countries' value share (cost of beans as share of retail price)	$(0.893P_B - 0.85)/P_R$	50%	43%	43%	43%

Note: The price data are from Table 2. Based on average retail prices for 1 March 2009─26 February 2012, and average prices of imported green beans for January 2009–November 2011.

Table 4. Distribution of premium paid for organic Fairtrade roasted and ground coffee, in SEK/kg (500 g packages)

Measure	Definition	Conventional coffee	Fairtrade organic, other costs=0	Fairtrade organic other costs =SEK 5
Retail price	P_{Ri}	62.00	85.27	85.27
Cost of beans (inclusive of VAT and weight lost)	$P_{Bi} = P_{impi}(1.12)(1.19)$	37.95	48.30	48.30
Difference in 'other costs' (assumed)	P_{OCi}	0.00	0.00	5.00
Producer countries' income	$0.893(P_{BF} - P_{BC})$	-	9.25	9.25
Fairtrade Sweden's income	$P_{FTC} = 0.893\left(0.015\left(P_{RF}/1.12\right)\right)$	-	1.02	1.02
Roasters/retailers' excess margin	$M_F - M_C$	-	11.60	7.90
Total additional income from Fairtrade sales	R_{FTR}	-	21.90	18.15
Producer countries' share	$\left[0.893(P_{BF} - P_{BC})\right]/R_{FTR}$	-	42%	51%
Fairtrade Sweden's share	$\left(0.893P_{FTC}\right)/R_{FTR}$	-	5%	6%
Roasters'/retailers' share	$\left[(M_F - M_C)\right]/\left[R_{FT} + (P_{NF} - P_{NC})\right]$	-	53%	43%
Sum of shares		-	100%	100%
Producer countries' share of consumer Fairtrade premium	$0.893(P_{BF} - P_{BC})/(P_{RF} - P_{RC})$	-	40%	40%
Producer countries' value share (cost of beans as share of retail price)	$(0.893P_B - 0.85)/P_R$	50%	46%	46%

Note: The price data are from Table 2. Based on average retail prices for 1 March 2009–26 February 2012 and average import prices on green beans for January 2009–November 2011.

Appendix

A: Additional tables

Table A1 reports regressions with various samples to show that the findings are not likely to be due to outliers or extrapolation, i.e. comparisons of completely different products. Five samples are used: 250, 400–499 g, and 500 g packages; 400–499 g and 500 g packages; only the four largest roasters; only inexpensive coffee, price < SEK 100/kg; and only coffee with national labels.

The estimated coefficients for Fairtrade and organic coffee are similar to the ones in Table 2. The most notable result is that the four large roasters have a somewhat higher price for the base category (SEK 64.60 vs. SEK 62.00) and add fewer SEK to Fairtrade and organic coffee. However, using these prices only marginally affects the distribution of shares; for instance, roasters/retailers get 57% instead of 61% when we assume that the difference in 'other costs' is SEK 5/kg. Another interesting result is that coffees in 250 g and 400–499 g packages are much more expensive than those in the standard 500 g package. However, they make up a small and heterogeneous groups. For example, in the 250 g group there are only 23 products. Prices range from SEK 52 to 186/kg, and the average price is SEK 51 higher per kg than the average price of 500 g packages. The 250 g group also includes three non-organic Fairtrade coffees, which were excluded from the sample because there are too few to provide a reliable estimate, and there are no non-organic Fairtrade coffees in the other categories. The prices of the three 250 g non-organic Fairtrade coffees are SEK 82, 95 and 186/kg.

The estimates of the coefficients for the control variables vary in some cases, particularly those of decaffeinated coffee and undefined roast. This is primarily due to few observations.

Table A2 reports Fairtrade's social premiums on world market prices of green beans, converted into SEK per kg for the production of 1 kg of ground coffee. As is evident, there was a sharp increase in premiums in March 2011. The values in Table A2 are used to calculate the cost of Fairtrade beans in Tables 3 and 4.

Table A1. OLS regressions on average price of ground coffee, various samples (USD 1 = SEK 7)

	250–500 g packages	400 g–500 g packages	Four large roasters only (400–500 g)	Only with price <SEK 100/kg (400–500 g)	No private label
Dark roast	8.474	6.921	5.183	6.129	6.796
	(3.43)***	(2.80)***	(2.06)**	(2.61)**	(2.27)**
Undefined roast	20.408	20.478	-7.766	7.344	22.440
	(2.69)***	(2.32)*	(3.91)***	(1.20)	(2.41)**
Decaffeinated	7.182	1.442	0.639	7.786	1.733
	(0.58)	(0.09)	(0.25)	(0.64)	(0.11)
Private Label	-14.026	-10.843		-10.957	
	(5.62)***	(4.62)***		(5.06)***	
250 g	51.594				
	(10.18)***				
400–499 g	22.734	24.277	12.792	15.962	24.369
	(5.36)***	(5.63)***	(3.90)***	(4.83)***	(5.59)***
Fairtrade Organic	27.629	26.780	21.631	23.412	27.241
	(7.92)***	(7.52)***	(9.19)***	(12.17)***	(6.60)***
Organic only	7.342	6.907	5.935	7.025	4.373
	(2.00)**	(1.96)*	(2.05)**	(2.23)**	(0.82)
Constant	60.768	60.580	64.642	61.347	60.449
	(26.27)***	(25.48)***	(29.39)***	(26.83)***	(23.39)***
R^2	0.64	0.42	0.44	0.38	0.34
N	182	162	65	155	124

Note: Average price for 1 March 2009–26 February 2012. Products with price below SEK 10/kg and three Fairtrade non-organic products in 250 g packages are excluded. Robust standard errors are used. * p<0.1; ** p<0.05; *** p<0.01.

Table A2. Fairtrade coffee social premiums in SEK/kg (washed Arabica), inclusive of weight lost due to roasting (USD 1 = SEK 7.00).

	Up to March 2011	From April 2011
Fairtrade social premium	1.85	3.70
Organic beans social premium	3.70	5.55
Sum	5.55	9.25

B: Calculations of shares

It is straightforward, in principle, to calculate how the premium paid for Fairtrade coffee is distributed, though it involves a number of steps. The key issues are how to treat VAT, which is the share that goes to the government in the form of tax, and what to assume about potential differences in production costs between Fairtrade and conventional coffee, in addition to the cost of beans and licence fees.

In the calculations described below all prices and costs are measured inclusive of VAT. In Sweden, VAT on food is 12%, i.e. 10.7% of the price inclusive of VAT. It is 25% on other products relevant for the study, which equals 20% of the price inclusive of VAT. All prices and costs are in SEK per kg of coffee. USD 1 is about SEK 7.

- Roasters'/retailers' margin, M_i, on 1 kg of roasted and ground conventional or Fairtrade coffee is

  $$M_i = P_{Ri} - (0.107P_{Ri} - 0.107P_{Bi} - 0.107P_{FTC} - 0.2P_{OCi}) - P_{Bi} - P_{FTC} - P_{Oi},$$

  where *i* is *C* for conventional coffee and *F* for Fairtrade coffee, P_{Ri} is retail price, P_{Bi} is the bean price adjusted for weight lost when roasting, P_{FTC} is the roasters' cost for Fairtrade certification and P_{Oi} is 'other costs'. Based on an analysis of wholesale prices and the cost of beans, I use SEK 5 as the maximum difference in 'other cost' between Fairtrade and conventional coffee, which is likely to be much higher than the actual difference in 'other costs'. Roasters'/retailers' margin is thus the retail price minus costs and net payments of VAT (the terms in parentheses).
- Import price for beans inclusive of VAT and weight lost is $P_{Bi} = 1.19P_{impi}$, where P_{impi} is the border price of conventional or Fairtrade green beans and 1.19 is adjustment due to weight lost (ECF, 2014).
- Producer countries' income from sales of Fairtrade beans is $0.893(P_{BF} - P_{BC})$, where 0.893 removes the VAT from the difference in prices of Fairtrade and conventional beans.
- Fairtrade Sweden's income from the certification fee is $P_{FTC} = 0.893\left(0.015 * 0.893P_{RF}\right)$. Fairtrade Sweden gets the net of VAT value of SEK 0.015 of the retail price net of VAT.
- Roasters/retailers' excess margin from sales of Fairtrade coffee is $M_F - M_C$, i.e. the difference between the margins from sales of Fairtrade and conventional coffee.
- Total additional income from Fairtrade retail sales is $R_{FTR} = P_{FTC} + 0.893(P_{BF} - P_{BC}) + (M_F - M_C)$. It is made up of the licence fee plus the income of the producer country and roasters/retailers' excess margin from sales of

Fairtrade coffee. The income going to the government is ignored as VAT is small and uncertain.

- Producer countries' share of the total additional income from Fairtrade retail sales $\left[0.893(P_{BF} - P_{BC})\right]/R_{FTR}$.
- Fairtrade Sweden's share of the total additional income from Fairtrade retail sales : P_{FTC}/R_{FTR}.
- Roasters'/retailers' share of the total additional value of Fairtrade retail sales: $(M_F - M_C)/R_{FTR}$.
- Producer countries' share of the difference between Fairtrade and conventional retail prices is $0.893(P_{BF} - P_{BC})/(P_{RF} - P_{RC})$.
- Producer countries' value share is the cost of beans used to produce 1 kg of coffee, net of freight and insurance costs (SEK 0.85), divided by the retail price: $(0.893P_B - 0.85)/P_R$.