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**ANALYSIS OF FAIR TRADE. ADVANTAGES FOR PRODUCERS AND WILLINGNESS TO  
PAY OF CONSUMERS**

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# 1 - Introduction

Fairtrade (FT) is a niche market that has successfully entered the mainstream distribution channels in most of western countries (Andorfer & Liebe, 2012; Le Mare, 2008; Raynolds, 2017), and today it is the most widely recognized ethical label in the world. The concept underlying the FT certification is simple: relying on consumers' willingness to pay (WTP) for products with a higher ethical content, FT imposes more equitable conditions of production and trade over certified products, in order to improve working conditions and empower small farmers and hired laborers in developing countries (Krumbiegel et al., 2018; Raynolds, 2012). The FT mark certifies that the product meets the FT standards, a set of rules that regulates the entire supply chain of certified products, from the production to the final distribution (Carrington et al., 2010). There are specific standards according to the type of product, the type of organization (small farmers' organizations and hired labor organizations) and the role within the supply chain (producer organizations, importers, commercial brands, etc). Standards include minimum requirements that producer organizations must meet in order to be qualified for the certification and requirements aimed at achieving specific objectives in terms of social, environmental and productivity goals. Among the tools that FT uses to improve conditions for the most marginalized producers, the most important are two. The first one is the requirement for farmers to be structured in democratic organizations, which allows to cut out several links in the supply chain and thereby empower producers by increasing market and bargaining power. The second one is the FT price system, which includes a FT minimum price that buyers must pay to producers, and the FT social premium, an extra sum of money that is

paid to farmers and hired workers on top of the price they receive for their produce or labor and is meant to be invested in improving the quality of their lives.

Today, FT encompasses 1.65 million farmers and workers, organized in more than 1,200 producers' organizations, spread across 77 countries worldwide, producing goods that are sold in over 125 countries through different types of distribution channel (Fairtrade International, 2017). There are over 30,000 FT certified products on sale worldwide and standards for both food and non-food products. Global sales of FT certified products have grown further from 7.3 million euros in 2015 (Fairtrade International, 2016) to 7.88 million euros in 2016 (Fairtrade International, 2017).

Fair Trade (FT) as we know it today stems from the 1960's alternative trade organizations, with church-based and European development movements selling handicrafts and other items bought directly from Third World producers (Reed, 2009; Shreck, 2005). In the late 1980s, country-specific FT labels are born throughout Europe. Beginning in 1998, the main producers' networks operating in Europe with their own respective ethic marks have harmonized their activities under the umbrella of the FLO, the world's largest and most recognized FT organization. From 2002 the international FAIRTRADE Mark has officially become the globally recognized symbol of FT. In particular, two turning points led to the expansion of FT and boosted its sells worldwide: the introduction of formal labeling initiatives in Europe in 1988 (Doherty et al., 2013; Reynolds, 2002; Renard, 2005), and the adoption of a mainstream strategy, during the 1990s, that brought FT products on conventional supermarket shelves (Méndez et al., 2010; Reed, 2009) and led to cooperation with large companies and multinationals (Doherty et al., 2013). Since then, the FT label can be found on the packaging of products produced by large multinationals sold in supermarket chains as well as on

productions performed on a small scale and sold through alternative shops or dedicated mail order (Doherty et al., 2013; Méndez et al., 2010; Moore, 2004; Reed, 2009). The relevance and potential of FT is confirmed by the high level of reputation of and traded volumes by the companies and distributors that, to varying degrees, have joined the FT project (Reed 2009). Among the well-known companies that have engaged commercial agreements with fair trade there are the most famous cases of Starbucks, Nestlé, Cadbury Dairy Milk, Tate & Lyle's, Tesco, Mars Maltesers, Carrefour and COOP (Doherty et al., 2013; Renard, 2005).

The success and strategies undertaken by FT over the years have nourished doubts and criticism from detractors of ethical certifications and from that part of the original advocates that would not accept the collaboration with large corporations and brands. These criticisms have led to a heated debate on the actual effectiveness of ethical certifications, resulting in the emergence of different ethical certification schemes and the involvement of researchers with different backgrounds to the theme of the FT. Indeed, FT is not a new topic in research: since the 80s there has been an extensive debate in the academic literature, discussing several aspects of the system from a wide range of disciplines, including economics, marketing, agriculture, rural studies, development studies and theology (Moore, 2004). Research on FT has developed along three main strands: the first deals with the theoretical foundations of the FT system, the second on the impact on producers, the third on consumer preferences towards certified products.

The motivation behind this thesis is to perform an economic analysis of the FT system, that encompasses the following three main aspects:

- i) academic literature published on FT,

- ii) economic effects and welfare consequences for producers supplying the FT system,
- iii) consumers' WTP and preferences for FT certified products.

Because of the wide scientific production and the conflicting results concerning the effects and potentiality of FT, a systematic approach to the FT literature was necessary to provide a robust and comprehensive review of scientific literature. Bibliometric analysis was used to analyze the literature on FT; using different techniques (productivity analysis, word frequency, network and cluster analysis), and different software (Bibexcel, VosViewer, Pajek), the relevant intellectual base on which research has been built on was identified, mapping its structure over time and evaluating results provided by researchers of different disciplines. This process also highlighted the major gaps that need to be filled and guided the subsequent steps of the research.

The impact of FT certification on producers has been analyzed in several studies over the years. However, there is still no definite answer to the question whereas FT delivers its core message or not (Le Mare, 2008; Nelson & Pound, 2009, Terstappen, Hanson, and McLaughlin 2013), as we do not yet have a complete picture and unclear and sometimes conflicting results are reported. Studies on FT impact have been traditionally related to regional or local scale, they have been geographically concentrated in Central America and West Indies, and mainly focused on three products: coffee, bananas and cocoa (Le Mare, 2008; Ruggeri et al., 2018; Terstappen et al., 2013). Most of the empirical researches employ direct investigation techniques as surveys, questionnaires and focus groups, usually involving farmers (Arnould et al., 2009; Bacon et al., 2008). Griffiths (2011) found significant methodological weaknesses in many impact studies, as for the identification of external inputs (Valkila, 2009), the selection of

the cooperatives for case studies (Smith, 2009), measurement of labor inputs and the lack of adequate control groups and data over time. The FT social premium has received little attention and has been often overlooked in impact studies. Even though FT premium is one of the key benefits of participating in FT certification, there is little analysis of its impact and the resulting investments from it (Ruben & Fort, 2012; Valkila, 2014). This is mainly due to the difficulty in obtaining FT social premium data, and in the lack of knowledge about the FT model among the members of organizations.

This research develops directly from the partnership between the no-profit organization Fair Trade Italia and the University of the Studies of Milan, with the goal of providing a comprehensive picture of the producers' network of FT, thanks to a wide basis of data, never analyzed before. Indeed, the comprehensive dataset on all the certified producers' organizations that is collected yearly by the Monitor, Evaluation and Learning (MEL) program was analyzed. The database is collected for internal use and improvement and comprises data about all certified producers' organizations working with FT in the year 2015, including all types of organizations for all the certified products worldwide. The analysis focuses mainly on the two economic tools of the FT system: the income effect, the active gain for certified organizations that can derive from FT, and the social premium, the amount of money received on top of the selling price by certified products to be spent in organization and community projects. Kernel-based regularized least squares, a semi-parametric regression model, is used to analyze the allocation of the revenues and of the social premium paid by FT to producers' organizations, with respect to the stated goals of FT and to the previous findings from the literature.

To our knowledge, no research has studied how fair trade allocates revenues and social premium among the organizations that compose the network of certified producers. Indeed, it

is often found in literature that producers' organizations join the FT market in different ways, in some cases selling the entire production at FT condition and in some others selling only part of their production. Literature reports cases of situations in which early entrants are controlling the Fairtrade market (Valkila & Nygren, 2010), resulting in uneven distribution of market shares between producers. This indicates that there might exist unfair distribution of Fairtrade volumes that can be sold between producers (Valkila & Nygren, 2010). As a result, the effects of the spread in the Fairtrade volume share of total sales by producers were investigated, as uneven distribution might leave some Fairtrade producers worse off than working without certification.

One of the controversial aspects in the recent history of FT is related to the opening of certification for certain products to hiring plantations and farms, as in the past FT had collaborated exclusively with small producers' organizations in which farmers are the owners of the co-operative. This opening received bipartisan criticisms from both the skeptics and part of FT advocates, who saw this strategy shift as an abandonment of the original mission of FT. However, it has been argued, it would be relevant to discuss which groups are most marginalized in developing countries. Since the FT program also has consequences for hired workers operating in the same regions, excluding them from the FT system would be short-sighted and careless. Therefore, one of the aspects that has been included in the analysis is if there are significant differences in the distribution of revenues and Social Premium within the FT producer network depending on the type of organization.

Another approach that has been included in the analysis, in order to assess the efficacy of FT, was to investigate welfare reallocation between countries. As FT major focus are marginalized producers in developing countries, considering organizations in relation to the classification by income of countries might reveal new insights.

Studying the allocation of the revenues and of the social premium payed by FT to producers' organizations in a more analytical way, with respect to the stated goals and previous findings from literature, can expand knowledge on the effectiveness of the FT system and the efficacy of bottom-up development strategies for producers and their communities. The purpose of this study is to inform producers organizations and the wider FT system about how the value generated by FT activity is allocated within the network of producers, in order to develop policy for the key stakeholders.

As previously mentioned, research on FT has been focused mainly on a limited number of products and in few geographical areas in the world. The analysis of the literature revealed that despite the indisputably relevant performances in the sugar sector, there are no publications concerning the certified sugar cane supply chain, and little is known about the network of producers' organizations operating with FT. For this reason, the third Paper provides a detailed analysis of the structure and functioning of the global sugar cane supply chain, with a special focus on the FT network of sugar cane-producing organizations. First, a description of the major trends of global sugar cane production and market are provided. Then, by analyzing the data from the MEL database by means of principal component analysis and hierarchical clustering, the structure and operations of sugar cane farmers organizations in the FT network are described, identifying their main features and providing a classification of organizations based on intrinsic characteristics and specific indicators.

The long-term success of Fairtrade, as well as for any certification system, ultimately depends on consumers' willingness to pay (WTP) a premium price for ethically certified products (Lyon, 2006). Especially when dealing with social issues, several problems in hypothetical research may occur: amongst others, studies' rather narrow theoretical focus,



attitude–behavior gap, hypothetical and social desirability bias and a lack of generalizability of empirical findings. Furthermore, the existing literature on the consumption of ethically labeled products is mainly based on hypothetical methods of elicitation of the willingness to pay (La Mare, 2008). To separate what people declares from what they are really willing to pay, in the fourth paper consumers WTP for Fair Trade certified food products was elicited using a non-hypothetical incentive compatible method: the Becker, DeGroot and Marschak auction (BDM). White refined cane sugar has been chosen as the product for the auctions for several reasons. First, refined white cane sugar is a new product for the Italian market. Although 80% of the world sugar is produced from cane, tradition and the Italian collective imagination are closely linked to beet sugar. In addition, the raw material from which the sugar is extracted is rarely mentioned on white refined sugar packages, and cane sugar is commonly associated with amber or brown sugar. A refined white cane sugar, sold under this trade name, and identical from every point of view to the homologue produced by beet, is a novelty on the Italian market. Second, white refined sugar is traded on a large scale, it is used by most consumers and its taste is standardized and widely recognized. Furthermore, as a typical export product of developing countries, sugarcane production automatically brings up concerns about ecological and social sustainability, which are crucial in the narrative of FT. In particular, the paper address four main goals: 1) to elicit consumers' WTP for a white refined sugar made from sugarcane, 2) to assess the effects on consumers' WTP of the presence of the fair trade logo on the sugar package, 3) to investigate the effect of information about the FT system on consumers' WTP, and 4) to test the method called "titration BDM" (Mazar et al., 2014), which has been proved to reduce or eliminate sensitivity to the price distribution. Furthermore, the ethically minded consumer behavior (EMCB) questionnaire was administered to participants, measuring the

degree to which individuals perceive themselves as ethically minded when making their daily purchases. The experiment was conducted over three days in a large famous supermarket in Milan, in September 2018.

The thesis is structured as follows. An introduction is given in chapter one, setting up the foundation for the thesis by describing the FT system and introducing the main topics that have been addressed. This is followed by a section with a description of abbreviations meaningful for the comprehension of the thesis. Chapter three presents the bibliometric analysis of published research on FT, whose results were also used to plan subsequent analysis on producers and consumers. Chapter four presents the analysis of the MEL database of all producers' organizations working with FT, providing new information about the structure and functioning of FT. Following, cane sugar supply chain is analyzed and presented in chapter five, with a specific focus on cane farmers certified by FT. Chapter six is dedicated to the investigation of consumer preferences and WTP for white refined cane sugar certified by FT through BDM experimental auction. Conclusions are presented in chapter seven, along with suggestions for further research.

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## **2 - A bibliometric analysis of the scientific literature on Fairtrade labelling**

### **Abstract**

Since its foundation, the Fairtrade movement has attracted the attention of consumers, practitioners, media and scholars. Discussing the role that Fairtrade can play on a global yet locally rooted scale is very complex, as research reports contrasting results about its usefulness and effectiveness. This study examines scientific research on Fairtrade over the last decades by conducting a bibliometric analysis of the literature published on the ISI Web of Knowledge Core Collection, which included 876 papers by 1,293 authors in 432 journals. Results show that despite this being a relatively recent field of study, Fairtrade has been approached from different disciplines with different methodologies and objectives. The structured quantitative study of the literature enabled us to inspect how research has evolved over the years in the light of the changes faced by Fairtrade, to explore its scope in the broader field of the global market, to detect current research schools and perspectives within the network and to identify hitherto unaddressed issues and unconnected subfields.

**Keywords:** Fairtrade, Fair Trade, Bibliometric analysis, Co-citation, Bibliographic coupling

# Introduction

Fairtrade (FT) is a product certification and labelling system that seeks consumers' recognition through quality labels and public and/or private certification (Renard 2005), by standardizing and unveiling the conditions of production (Naylor 2014). The concept that underlies FT certification is quite simple: relying on consumers' willingness to pay (WTP) for products with a higher ethical content, FT imposes more equitable conditions of production and trade over certified products, in order to improve working conditions and empower small farmers and hired labourers (Raynolds, 2012; Krumbiegel et al., 2018).

Today, FT encompasses 1.65 million farmers and workers, organized in more than 1,200 producers' organizations, spread across 74 countries worldwide, producing goods that are sold in over 125 countries through different types of distribution channel (Fairtrade International 2015). There are over 30,000 FT certified products on sale worldwide and there are standards for both food and non-food products.

The true significance of FT might not lie in its market share but in its ability to create new links between producers in the south and consumers in the north (Raynolds, 2000, 2002; Low & Davenport, 2005), as FT sales grew by 27% in 2009-2010, 21% in the following two years and 15% in 2012-2013, passing from a total turnover of 3.4 billion euros in 2009 to 5.5 billion euros in 2013 (Fairtrade International 2012; Fairtrade International 2015). More recently, global sales of FT certified products have grown further from 7.3 million euros in 2015 (Fairtrade International, 2016) to 7.88 million euros in 2016 (Fairtrade International, 2017). Most of the sales are concentrated in the US, UK and Germany but many new markets are expanding rapidly and have already achieved significant sales (Fairtrade International, 2017).

One of the most interesting aspects that stands out when it comes to Fair Trade is the dynamism that has characterized this movement from its inception birth until the present day,



and the strategies that the movement has adopted to respond to the changing conditions of global exchange over the years (Shreck, 2005; Jaffee, 2007; Reed, 2009). Nevertheless, FT success and growth worldwide has depended primarily on two turning points: the introduction of formal labelling initiatives, launched in Europe in 1988 (Raynolds, 2002; Renard, 2005; Bacon, 2010; Doherty et al., 2013), and the increasing involvement of corporations in FT, in what has been described as a mainstream strategy, during the 1990s. Since then, the FT label can be found on the packaging of products produced by large multinationals sold in supermarket chains as well as on productions performed on a small scale and sold through alternative shops or dedicated mail order (Reed, 2009; Méndez et al., 2010; Doherty et al., 2013; Moore, 2004).

Fairtrade (FT) is not a new subject in academic literature: starting from the 1980s it has attracted the attention of scholars from a wide range of disciplines, including economics, marketing, design, agriculture, rural studies, development studies and theology (Moore, 2004). On the basis of the large bibliography of scientific researches that have analyzed FT over the years in which the movement has developed and evolved, a structured quantitative study of the literature can help (i) to explore the scope of the FT in the broader field of global market over time, (ii) to detect the most influential articles that have been at the base of the research, (iii) to detect current research schools and perspectives within the FT and (iv) to identify unaddressed issues and unconnected subfields. Accomplishing these goals will substantiate evidence from field studies and literature reviews of the FT and help cross-validate their findings and assessments.

Although there have been several reviews dedicated to the topic of FT, none of them provides a comprehensive analysis of the FT scientific literature through bibliometric tools.

Furthermore, previous reviews focus only on research on specific aspects one at a time, rather than addressing the research in its entirety. For example, Andorfer and Liebe (2012), Grankvist (2012) and Straight (2013) focus on individual consumption of FT certified products, while Le Mare (2008), Nelson and Pound (2009), Terstappen et al. (2013) and Krasnozhan et al. (2015) focus on the social and economic impact of ethical certifications on producers. McArdle and Thomas (2012) analyze gender empowerment within the network of FT producer organizations, while Parvathi and Waibel's study (2013) proposes an analysis of the opportunities and constraints regarding organic and FT certified production in developing countries. Barros et al. (2015) use bibliometric methods only to employ a performance analysis, not a comprehensive science mapping, on the literature concerning FT, which was also produced for the purpose of this study and is reported in the third section. It is worth noting that not all the mentioned publications are indexed in scientific libraries such as Scopus or Web of Science, as some of them fall into the category of grey literature.

The present paper attempts to analyze and critically appraise the literature on FT by means of the methodologies and instruments provided by bibliometrics. Our analysis makes an important contribution for scholars interested in the study of FT, as it provides a quick reference guide for interdisciplinary researchers as well as marketers who want to know how the FT movement has been addressed by scientific research over the years. We identify the main countries, institutions, journals, authors and articles in this research area, and then outline the structure of research on FT over time, synthesizing the main streams through the use of citation-based networks.

## **Fairtrade: scope and benefits**

FT differs from most other food certification systems (i.e. organic, Shade Grown Coffee, Forest Stewardship Council), as it goes beyond the mere supervision of production phases, by normalizing also trade relations (Renard 1999; Raynolds 2000; Taylor 2005). In doing so, FT supports more socially just and environmentally sustainable international exchanges, production, and more generally, equitable economic relations between producers and consumers (Raynolds 2002; Raynolds, Murray and Taylor 2004). The FT mark certifies that the products meet the FT standards, which are a set of standards that regards both process and quality of the labeled products, including minimum labour, development and environmental standards, as well as progress requirements to strengthen producers' organizations and community living conditions (Raynolds 2014; Renard 2005). In exchange for the compliance of FT standards, as well as to seize the opportunity to engage in solidarity and ethical actions (Renard 2005; Taylor and Boasson 2014), socially conscious consumers are willing to pay a premium price for these products, which are sold at a slightly higher price than regular market products (De Pelsmacker, Driesen and Rayp 2005; Loureiro and Lotade 2005; Taylor and Boasson 2014; Valkila 2014).

Through the FT mark, consumers are able to engage in a symbolic relationship with producers in poor countries (Whatmore and Thorne 1997; Raynolds 2002), rewarding companies that are at the forefront in combining social, environmental and economic value. Since this quality-based market relies on trust and collective principles, the role of certification agencies and labels become central, as it is by their intervention that value tied to alternative conventions is added to FT products and it is made valuable for consumers.

Producers benefit from participation in FT network as they are granted the Fair Trade price mechanism, which comprises the minimum price, the social premium and the organic premium (Fairtrade

Labelling Organizations International 2016). The minimum price is set in such a way as to cover the cost of sustainable production: when the market price is higher than the FT minimum price, producers receive the current market price or the price negotiated at contract signing (Fairtrade Labelling Organizations International 2016). In addition, farmers are granted the social premium, which is paid on top of the agreed price and has to be invested in social, environmental and economic development projects. The uses of the social premium are democratically voted within every cooperative with the direct participation of farmers and workers (Valkila 2014). Other benefits for producers comprise long-term relationships and supply contracts, pre-financing, democratic structure and transparent administration of cooperatives, information, technical and financial support (Raynolds et al. 2004; Moore 2015; Davies, Doherty and Knox 2010; Doherty, Smith and Parker 2015).

## **Methods**

The methods followed in this paper are rooted in bibliometrics (Garfield, 1955; De Solla Price, 1965; Small, 1973) which consists of a set of methods that can be employed to evaluate research through statistical analysis of bibliographic data, commonly focusing on citation analysis of research outputs and publications. Bibliometric covers two main categories of analysis: performance analysis and science mapping (Noyons et al., 1999; Moed et al., 2005; Van Eck & Waltman, 2014). The first category aims to evaluate actors (mainly authors, institutions, journals and countries) on the basis of bibliographic data. The second category, science mapping, is a spatial representation of bibliometric networks to explore the interrelation between disciplines, fields, specialties, individual papers or authors. There are several bibliometric techniques that have been developed over time to build a science map (Small 2006), the most commonly used being documents co-citation and bibliographic coupling

analysis (Cobo et al. 2011). In bibliometrics, citation counts are assumed to generally reflect the resonance of a paper in the scholarly community in an objective and measurable way.

### ***Co-citation***

Co-citation analysis (Marshakova, 1973; Small, 1973; Small & Griffith, 1974; Small & Crane, 1979) is a bibliometric technique proposed by Small (1973) that aims to map the structure of a research field through the analysis of groups of documents that are commonly cited together (Cobo et al. 2011). Two documents are said to be co-cited when they both appear in the reference list of a third document; the more papers they are both cited by, the stronger their association. The major drawback of co-citation analysis is that it is regarded as an approach biased towards ‘the past’ of an academic field, as it is more likely to capture older contributions and well established scholars rather than the forefront of the research (Van Eck et al., 2013; López-Fernández et al., 2016). Not surprisingly, this technique is used to provide a comprehensive historical view of the intellectual structure of a specific field of study. The co-cited papers in each cluster tend to share some common themes and they are considered to represent the core knowledge base of a research area: the key concepts, methods, or experiments that researchers build on (Small 1980). Co-citation analysis allows the exploration of dynamics of scientific development and conceptual shifts of a specific subject (Small 1973).

### ***Bibliographic coupling***

Bibliographic coupling can be interpreted as the opposite process to co-citation: two publications are said to be bibliographically coupled if there is a third publication that is cited by both publications (Vladutz & Cook, 1984; Glänzel & Czerwon, 1996; Jarneving, 2007).

Bibliographic coupling analysis assumes that when two papers show similar bibliographies, they are likely to represent the same or at least related research topics. To overcome the “backward looking” of the co-citation analysis we used the bibliographic coupling technique to highlight the FT recent trends. The threshold for the minimum shared references between coupled publications was set to 10 to eliminate very isolated nodes.

The larger the number of references two publications have in common, the stronger the bibliographic coupling relation between the publications (Van Eck & Waltman, 2014). Bibliographic coupling is about the overlap in the reference lists of publications, thus focusing on the association between two citing publications (Van Eck & Waltman, 2014). One advantage of bibliographic coupling, compared to co-citation analysis, is the absence of restrictions on frequently cited papers. Therefore, the results of bibliographic coupling do not depend on the moment in which the data are collected, and since documents that include citations are more recent than the documents they cite, this method is suitable to investigate more recent contributions.

### ***Mapping and clustering strategy***

As our intention is to focus on both past and present research, we have chosen to jointly apply co-citation and bibliographic coupling on the body of scientific literature dealing with FT, in order to combine the insights provided by the two techniques. Both co-cited and coupling linked articles are assumed to form groups of publications that represent the same or at least related research topics, and both techniques aim to detect groups of publications that share a common intellectual background.

The co-citation procedure is constructed as follows. From the reference lists of the set of publications, documents that are cited more than a specified threshold are coupled according to how frequently the pair co-occur in the reference lists. Conversely, documents that share more than a specified threshold of references are selected to construct the bibliographic coupling network, where the number of shared references represents the coupling strength between them. To produce empirical readable maps of prominent research in the academic discipline, only papers that received at least 20 citations were used for the co-citation network; papers with at least three citations were used for the bibliographic coupling network. After the normalized networks have been computed, the next step is to position the nodes in a two-dimensional space in such a way that strongly related nodes are located close to each other, while weakly related nodes are located far away from each other. Documents skimming, the extraction of the cited literature, and the creation of the co-citation and coupling matrix of references were computed through the software Bibexcel, and then processed in the software VOSviewer for mapping and clustering. Starting from a correlation matrix, VOSviewer constructs the map by calculating a similarity matrix based on the co-occurrence matrix, then the VOS mapping technique is applied to the similarity matrix. The criteria used by VOS is to minimize the weighted sum of the squared distances between all pairs of publications, weighted by the similarity between them (Van Eck & Waltman, 2010). The VOS mapping technique locates publications in a low-dimensional space in which the distance between any two items reflects the similarity or relatedness, then cited documents are aggregated in clusters by sequentially linking together all selected pairs of cited documents. These clusters represent the intellectual base of the different subfields of research.

## ***Searching strategy***

The bibliographical data gathered in this study were collected from Thomson Reuters' ISI Web of Science (WoS). In order to ensure the highest quality of the document sample, we downloaded articles from the "Core Collection" covering the period 1985 to 2017. Moreover, WoS has been used across a wide range of scientometrics studies and the main software of bibliometric analysis is set up for it (among others, see Di Stefano et al., 2010; Appio et al., 2014; Fetscherin and Heinrich, 2015; Fiala and Tutoky, 2017; Gurzki and Woisetschläger, 2017). We have used as keywords the terms "fairtrade" and/or "fair trade" in the field Topic, which contains titles, abstract and keywords. The choice to use quotes in the search is motivated by the different meanings that the two terms "Fair" and "Trade" may assume when taken individually (e.g. trade fairs). Another factor that may affect the data is given by the WoS Keyword Plus, which is based on the bibliography and automatically generated through an algorithm and therefore may be inconsistent with the terms of the search (Garfield and Sher 1993). For these reasons, coherence with the subject matter of the resulting 1,162 portfolio of papers has been verified by reading the titles, and in some cases the abstract and articles as well. Through this (tedious) process, 286 documents have been removed from the database, leading to a final dataset of 876 documents. Data were collected in November 2016, after which the database cleaning process to ensure consistency with the topic, the creation of clusters and especially the analysis of the papers, took a time ranging from 9 to 12 months. However, it should be mentioned that these types of networks, which represent the structure of the research based on the references, are slow to change and it takes time before more recent publications appear in the clusters due to citation lag.



## Data

Table 1 and Figure 1 present several characteristics of the FT publications between 1985 and 2015. The study of the number of publications and authors reveals the growing interest in this subject. In more detail, FT has become a real subject of studies since 2005: even though the earlier documents are dated back to 1985. From 2005, all these parameters show a growing trend that culminates with a maximum reached in 2010; from the following year a short slowdown is noticed, immediately followed by a steady increase over the following five years that has lasted until today. It is worth noting that the increase of FT-related publications from 2005 coincides with the end of a period of radical changes in the coffee market, which still represents the most important fair-labelled product, both in terms of sales volume and number of countries involved. Keeping in view this temporal distribution of scientific production on FT,

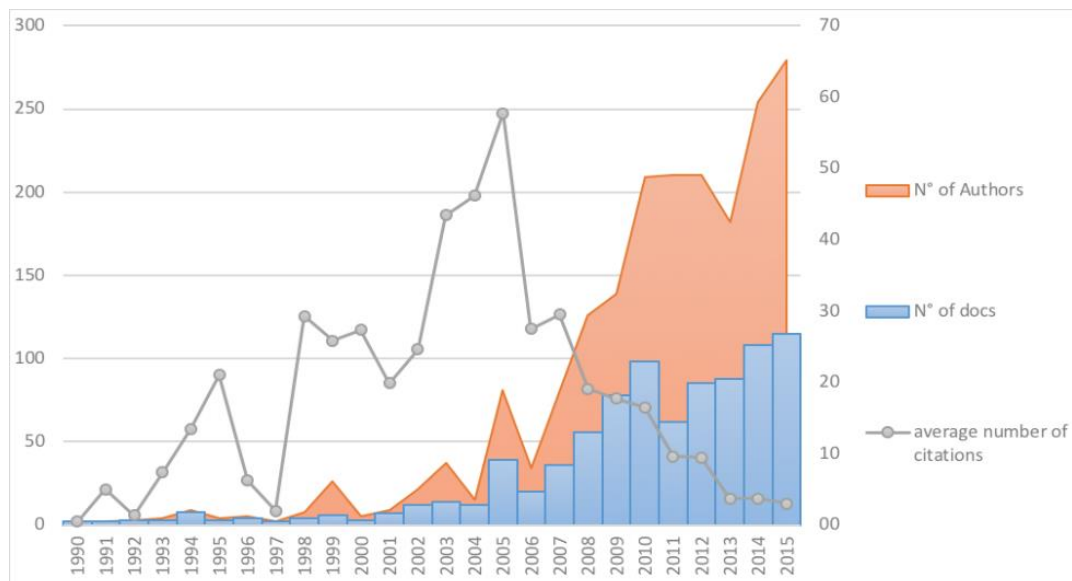


Figure 1: Growth trends of FT publications, authors and citations.

Year	total publications	N° of Authors	N° Au/N° Docs	Times Cited	average number of citations	N° of references	N° of references / N° of docs	Cited references publication year *
1990	2	2	1,0	1	0,5	12	6,0	410
1991	2	2	1,0	10	5,0	39	19,5	562
1992	3	3	1,0	4	1,3	29	9,7	524
1993	3	4	1,3	22	7,3	302	100,7	631
1994	8	9	1,1	107	13,4	170	21,3	727
1995	3	4	1,3	63	21,0	69	23,0	780
1996	4	5	1,3	25	6,3	61	15,3	906
1997	2	2	1,0	4	2,0	0	0,0	1123
1998	4	8	2,0	117	29,3	124	31,0	1102
1999	6	26	4,3	155	25,8	183	30,5	1383
2000	3	5	1,7	82	27,3	57	19,0	2103
2001	7	9	1,3	139	19,9	140	20,0	1980
2002	12	21	1,8	295	24,6	303	25,3	2742
2003	14	37	2,6	608	43,4	374	26,7	2807
2004	12	15	1,3	554	46,2	555	46,3	2927
2005	39	81	2,1	2250	57,7	1854	47,5	3817
2006	20	34	1,7	550	27,5	1043	52,2	2980
2007	36	81	2,3	1061	29,5	1799	50,0	3515
2008	56	126	2,3	1068	19,1	2308	41,2	3066
2009	78	139	1,8	1383	17,7	3816	48,9	2939
2010	98	209	2,1	1613	16,5	5319	54,3	2714
2011	62	210	3,4	596	9,6	3179	51,3	2012
2012	85	210	2,5	806	9,5	5077	59,7	1612
2013	88	182	2,1	327	3,7	4855	55,2	1066
2014	108	254	2,4	397	3,7	6215	57,5	726
2015	115	279	2,4	148	1,3	6986	60,7	259

Table1: quantitative analysis of trends of research on FT

\* Cited references publication year: indicates the sum of the number of citations received from the documents included in the database divided by year of publication of the cited documents.

# Results

This section discusses the findings of the quantitative analysis of the data.

## Mapping representation

From 1985 to 2015, universities from 72 countries have contributed to FT research: the USA has always played a dominant role with almost 25% of the total publications, followed by the UK (17%), Canada (6%), France (6%), the Netherlands (5%) and Germany (4%). The 15 most productive countries and institutions are displayed in Table 2. The leading position of the USA and UK in FT literature is also evident through the analysis of the most active institutions and organizations: among the top 20 most productive institutions, the USA occupies the top four positions out of 20, and the UK occupies nine positions out of 20. The positions of leading European university and research centres for publications regarding FT belong to Wageningen in the Netherlands, followed by Rome in Italy.

Countries	N	%	Most productive institutes	N
USA	281	26%	Colorado State Univ (USA)	18
UK	198	19%	Univ Calif Santa Cruz (USA)	16
France	71	8%	Michigan State Univ (USA)	16
Canada	66	6%	Wageningen Univ (NETHERLANDS)	15
Netherlands	53	4%	Univ Warwick (UK)	14
Germany	50	4%	Univ Wisconsin (USA)	14
Australia	35	4%	Univ British Columbia (USA)	12
Italy	34	3%	Univ Oxford (UK)	12
Belgium	31	2%	Univ Roma Tor Vergata (ITALY)	11
Mexico	25	2%	Univ Lancaster (UK)	11
Switzerland	25	2%	Univ Kentucky (USA)	11
China	21	2%	Univ London (UK)	10
Japan	21	2%	Univ Sheffield (UK)	10
Spain	21	2%	York Univ (UK)	10
South Africa	20	1%	Vrije Univ Amsterdam (NETHERLANDS)	9

Table 2: Top 15 most productive countries and institutes in FT research

Figure 2 shows the network of cooperation among the top 20 productive countries in the FT field of research from 1985 to 2015. As one of the main purposes of FT is to foster the rights and living conditions of the inhabitants in the developing countries, for this reason, one might expect a great collaboration with institutions and researchers in disadvantaged countries. Conversely, with regard only to the academic world, the involvement of local universities and institutions is missing. Collaborations between countries and institutions concern countries of the so-called Global North, the USA and UK being the main cooperative countries. Anyway, this does not mean that FT research has a weak or no relevance to the countries of production, as many studies are based on collaborations with producer cooperatives and local organizations.

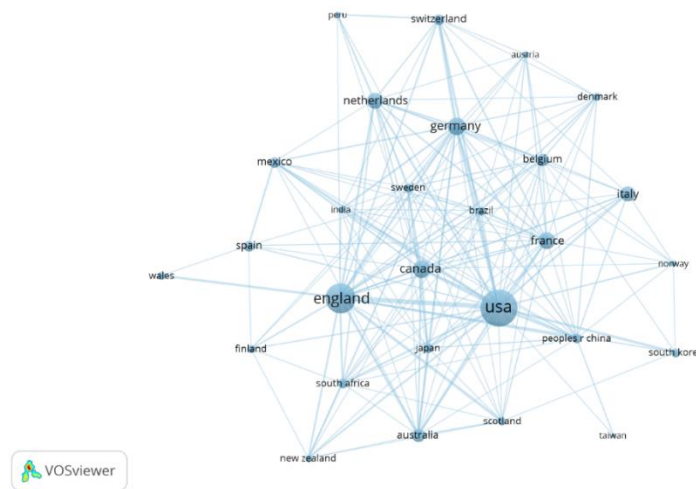


Figure 2: Network of collaborations between countries

FT appears to be a multidisciplinary research area. This feature can be observed both through the analysis of subject categories and the main sources that publish the documents that compose our database. The key disciplines of the data are Business & Economics (31%),

Agriculture (14%), Social Sciences (13%), Public Administration (12%), Environmental Sciences (11%) and Geography (9%). A total of 432 journals published pertinent literature on FT research all over the world during the period between 1985 and 2015. More than 35% of articles on the database appear in the 16 journals listed in Table 3. Overall, economic journals, especially those with a focus on development and ethical issues related to business, dominate the lists of the most influential journals in the research of FT. However, research on the subject seems to be rather fragmented with regard to the sources, and only the Journal of Business Ethics has a considerable number of publications, accounting for almost the 10% of the dataset.

Journals	N° of docs	%	Subject Categories	N° of docs	%
Journal of Business Ethics	83	9%	Business & Economics	340	22%
Geoforum	31	3%	Social Sciences - Other Topics	147	9%
International Journal of Consumer Studies	26	3%	Agriculture	129	8%
Agriculture And Human Values	24	2%	Public Administration	121	8%
Journal of Rural Studies	17	2%	Environmental Sciences & Ecology	109	7%
World Development	17	2%	Geography	90	6%
Sustainable Development	17	2%	Sociology	78	5%
Third World Quarterly	13	1%	Government & Law	69	4%
British Food Journal	13	1%	Food Science & Technology	52	3%
Environment And Planning A	12	1%	International Relations	47	3%
Journal of International Development	11	1%	Science & Technology - Other Topics	44	3%
Journal of Cleaner Production	10	1%	History & Philosophy of Science	35	2%
Globalizations	10	1%	Nutrition & Dietetics	24	2%
Cahiers Agricultures	10	1%	Engineering	24	2%
Ecological Economics	10	1%	Anthropology	21	1%
Food Quality and Preference	10	1%			

Table 3: Ranking of the most productive journals and most common subject categories

## Document co-citation analysis results

Document co-citation analysis examines the network of co-cited references and is used to map the underlying intellectual structure and dynamics of a field of study (Braam, Moed and Vanraaf 1991). The results of the top authors and papers in terms of citations are reported in Tables 4 and 5. Despite the number of citations not necessarily indicating the quality of a paper, it is a reliable proxy of its impact or visibility. The top five publications with the largest citation nodes are Bacon (2005), Jaffee (2007), De Pelsmacker et al. (2005), Renard (2003)(Renard 2003), and Raynolds 2002, indicating that these are the most frequently cited articles in FT research.

Authors	IC	TC
Raynolds L	342	561
Renard M	102	283
Bacon C	244	312
Jaffee D	46	209
DePelsmacker P	126	176
Guthman J	37	170
Ponte S	52	157
Gereffi G	0	152
Nicholls A	74	151

Table 4: Ranking of the 10 most cited authors.

TC = Total number of citations, not available for books. IC= number of citations by the documents of the database.

Publications	Title	IC	TC
Bacon C, 2005, V33, P497, World Dev	Confronting the coffee crisis: Can FT, organic, and specialty coffees reduce small-scale farmer vulnerability in Nicaragua?	116	224
Jaffee D, 2007	Brewing Justice Fair Trade Coffee, Sustainability, and Survival	106	-
Renard M, 2003, V19, P87, J Rural Stud	Fair trade: quality, market and conventions	97	179
De Pelsmacker P, 2005, V39, P363, J Consum Aff	Do Consumers Care about Ethics? Willingness to Pay for Fair-Trade Coffee	97	237
Raynolds L, 2002, V42, P404, Sociol Ruralis	Consumer/Producer Links in Fair Trade Coffee Networks	88	171
Raynolds L, 2000, V17, P297, Agriculture And Human Values	Re-embedding global agriculture: The international organic and fair trade movements	86	207
Goodman M, 2004, V23, P891, Polit Geogr	Reading fair trade: political ecological imaginary and the moral economy of fair trade foods	79	171
Nicholls A, 2005, Fair Trade Market Dr	Fair Trade: Market-Driven Ethical Consumption	74	-
Renard M, 2005, V21, P419, J Rural Stud	Quality certification, regulation and power in fair trade	71	120
Loureiro M, 2005, V53, P129, Ecol Econ	Do fair trade and eco-labels in coffee wake up the consumer conscience?	70	132
Moore G, 2004, V53, P73, J Bus Ethics	The Fair Trade Movement: Parameters, Issues and Future Research	69	106
Taylor P, 2005, V33, P129, World Dev	In the Market but Not of It: Fair Trade Coffee and Forest Stewardship Council Certification as Market-Based Social Change	64	200
Raynolds L, 2007, Fair Trade Challenge	Fair Trade: The Challenges of Transforming Globalization	61	-
Raynolds L, 2009, V37, P1083, World Dev	Mainstreaming Fair Trade Coffee: From Partnership to Traceability	55	92
Ponte S, 2002, V30, P1099, World Dev	The 'Latte Revolution'? Regulation, Markets and Consumption in the Global Coffee Chain	51	179

Table 5: Ranking of the 15 most cited publications. TC = Total number of citations, not available for books. IC= number of citations by documents of the database.

Figure 3a and Table 6 show the entire network of articles' co-citation analysis. The greater the size of the label, the greater the number of citations within our set of publications, references that are more likely to be cited together are closer each other. Labels are colored according to cluster identity. Using a single linkage clustering performed by the software Vosviewer, four clusters have been identified, including respectively 33 papers in cluster 1, 28 in cluster 2, 25 in cluster 3 and 16 in cluster 4. In addition, Figure 3b pinpoints the high impact of documents in terms of co-citation strength and citations received, in order to improve the readability of the co-citation network.

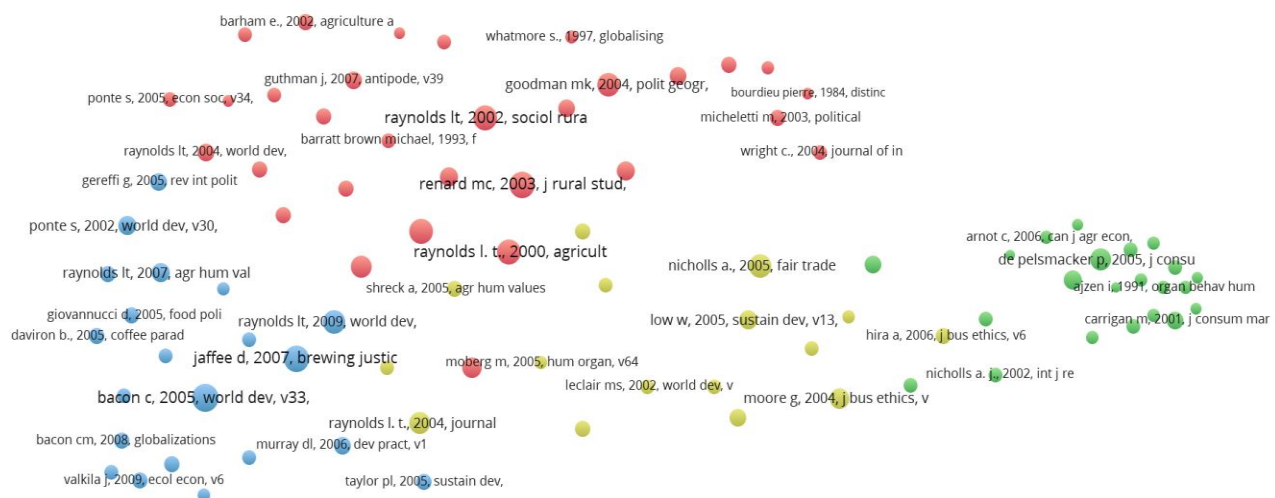


Figure 3a: network of references co-citation analysis

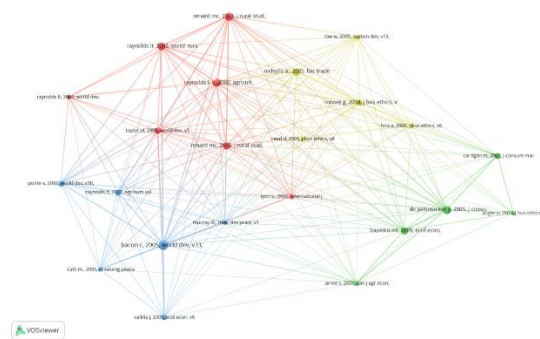


Figure 3b: detail of co-citation network, top co-cited publications

CLUSTER 1	citations	co-citation links	CLUSTER 2	citations	co-citation links
Renard M.C., 2003, j rural stud, v19, p87	97	814	De Pelsmacker P, 2005, j consum aff, v39, p363	97	539
Raynolds L.T., 2002, sociol ruralis, v42, p404	88	789	Loureiro M.L., 2005, ecol econ, v53, p129	70	396
Raynolds L.T., 2000, agr human values, v17, p297	86	765	Low W, 2005, int market rev, v22, p494	31	336
Renard M.C., 2005, j rural stud, v21, p419	71	728	Carrigan M, 2001, j consum mark, v18, p560	49	335
Goodman M.K., 2004, polit geogr, v23, p891	79	590	Shaw D., 1999, marketing intelligen, v17, p109	34	275
Taylor P.L., 2005, world dev, v33, p129	63	551	Davies J.A., 2003, j bus ethics, v45, p79	22	270
Renard M.C., 1999, sociol ruralis, v39, p484	44	440	Nicholls A.J., 2002, int j retail distrib, v30, p6	29	243
Lyon S., 2006, Int J Consum Stud, v30, p452	37	394	Doran C.J., 2009, j bus ethics, v84, p549	35	242
Guthman J, 2007, antipode, v39, p456	40	358	Bird K., 1997, business ethics euro, v6, p159	28	239
Raynolds L.T., 2004, world dev, v32, p725	35	339	Strong C., 1996, marketing intelligen, v14, p5	24	237
Mutersbaugh T, 2005, j rural stud, v21, p389	33	338	Shiu E., 2003, eur j marketing, v37, p1485	30	236
Hudson J, 2003, organ environ, v16, p413	41	337	Ozcaglar-toulouse N., 2006, Int J Consum Stud, v30, p502	26	232
Barham E, 2002, agr human values, v19, p349	27	314	De Pelsmacker P, 2007, j bus ethics, v75, p361	32	229
Bryant R.L., 2004, t i brit geogr, v29, p344	35	301	Arnot C, 2006, can j agr econ, v54, p555	36	221
Barnett C, 2005, antipode, v37, p23	42	286	Ajzen J, 1991, organ behav hum dec, v50, p179	32	204
Mutersbaugh T, 2002, environ plann a, v34, p1165	25	280	Shiu E, 2000, j marketing manageme, v16, p879	22	198
Ponte S, 2005, econ soc, v34, p1	32	264	Auger P, 2003, j bus ethics, v42, p281	28	1
Bacon C.M., 2010, j peasant stud, v37, p111	31	259	Chatzidakis A, 2007, j bus ethics, v74, p89	32	173
Micheletti M, 2003, political virtue and shopping	39	247	De Pelsmacker P, 2006, int j nonprofit volu, v11, p125	23	161
Jaffee D, 2010, agr hum values, v27, p387	23	226	Bermeir J, 2006, j agr environ ethic, v19, p169	33	159
Murdoch J, 2000, econ geogr, v76, p107	23	224	Auger P, 2007, j bus ethics, v76, p361	21	147
Whatmore S., 1997, globalising food, p287	30	224	Browne A.W., 2000, food policy, v25, p69	21	147
Mutersbaugh T, 2005, environ plann a, v37, p2033	25	209	Andorfer V.A., 2012, j bus ethics, v106, p415	23	129
Wright C., 2004, J. Int. Dev., v16, p665	22	208	De Ferran F, 2007, food qual prefer, v18, p218	21	117
Freidberg S, 2003, soc cult geogr, v4, p27	21	200			
Guthman J, 2004, cal stud crit hum ge, v11, p1	26	194			
Bourdieu Pierre, 1984, distinction social c	21	179			
Dolan C.S., 2010, geoforum, v41, p33	21	179			
Cashore B, 2004, governing markets fo	21	168			
Clarke N, 2007, polit geogr, v26, p231	21	159			

Table 6a: Reference co-citation analysis cluster composition



CLUSTER 3	citations	co-citation links	CLUSTER 4	citations	co-citation links
Bacon C., 2005, world dev, v33, p497	116	889	Nicholls A., 2005, fair trade market dr	74	605
Jaffee D., 2007, brewing justice: fair trade coffee	106	818	Moore G., 2004, j bus ethics, v53, p73	69	513
Raynolds L.T., 2004, j. int. dev, v16, p1109	50	600	Raynolds L.T., 2007, fair trade challenge	61	524
Raynolds L.T., 2009, world dev, v37, p1083	55	513	Tallontire A., 2000, dev pract, v10, p166	43	393
Ponte S., 2002, world dev, v30, p1099	51	434	[anonymous], 2007, fair trade coffee pr	43	375
Murray D.L., 2006, development in practice, v16, p179	34	393	Low W., 2005, sustain dev, v13, p143	37	372
Raynolds L.T., 2007, agr hum values, v24, p147	42	364	Barratt Brown M., 1993, fair trade reform	28	291
Gereffi G., 2005, rev int polit econ, v12, p78	41	349	shreck A., 2005, agr hum values, v22, p17	29	289
Taylor P.L., 2005, sustain dev, v13, p199	29	330	Hira A., 2006, j bus ethics, v63, p107	29	288
Valkila J., 2009, ecol econ, v68, p3018	41	325	Leclair M.S., 2002, world dev, v30, p949	32	277
Rice R.A., 2001, j agr environ ethic, v14, p39	32	293	Levi M., 2003, polit soc, v31, p407	28	267
Arnould E.J., 2009, j public policy mark, v28, p186	30	284	Reed D., 2009, j bus ethics, v86, p3	30	262
Bray D.B., 2002, soc natur resour, v15, p429	30	282	Murray D. L., 2000, agr hum values, v17, p65	28	254
Calo M., 2005, revaluating peasant co	30	273	Jaffee D., 2004, rural sociol, v69, p169	34	250
Daviron B.T., 2005, coffee paradox globa	27	256	Renard M.C., 2007, fair trade challenge, p138	23	248
Bacon C.M., 2008, globalizations, v5, p259	31	253	Low W., 2006, j strategic marketin, v14, p315	27	226
Murray D., 2003, one cup time poverty	23	245	Littrell M. A., 1999, social responsibilit	28	208
Talbot J.M., 2004, grounds agreement po	22	231	Moberg M., 2005, hum organ, v64, p4	21	200
Muradian R., 2005, world dev, v33, p2029	26	214			
Giovannucci D., 2005, food policy, v30, p284	23	210			
Becchetti L., 2008, world dev, v36, p823	23	183			
Mendez V.E., 2010, renew agr food syst, v25, p236	27	179			

Table 6b: Reference co-citation analysis cluster composition

### ***Cluster 1 – Theoretical foundations of FT***

Documents in the first cluster theoretically ground the foundations and principles on which FT is built. Articles of the first cluster provide an overall overview of FT from its origins to its current forms, tracing its history (Renard, 1999, 2003; Raynolds, 2000), explaining its organization (Renard 2003) and identifying how it developed and grew as a social-quality market niche in a

context characterized by agro-food market saturation, concentration of industry and trade, industry's expanding influence in the definition of quality, and homogenization of food practices (Renard, 1999; Raynolds, 2000). Drawing on convention theory (Renard 2003; Raynolds 2002) and commodity chain tradition (Raynolds 2002), the dynamic nature of FT is unveiled, showing how FT movement has been always shaped by recurrent tensions, contradictions and compromises within the multiple levels of the network. FT was born as a solidarity and charity model, but later switched to a partnership model (Tallontire, 2000; Raynolds, 2002) by means of a strategy that has often been summarized in the slogan "trade not aid". Later on, FT shifted from alternative trade selling channels – based on direct connections between consumers and producers – to mainstream retailers worldwide, and in more recent times the certification – that was once prerogative of cooperatives – has been extended to some plantation products (Renard, 2005; Reed, 2009).

Several papers of cluster 1 try to define the very nature of FT which contains a basic contradiction (Renard 2003), summed up in the phrase "in the market but not for it" (Taylor, 2005) or "in and against the market" (Barratt Brown 1993). Indeed, FT is in the position of having to operate within the same global capitalist market that it seeks to modify, while not responding solely to pure commercial logics. Documents in the first cluster are, for the most part, explicitly related to FT, but there are also interesting exceptions as Gereffi (Gereffi Humphrey, j., Sturgeon, T., 2005) and Ponte (Ponte, 2002; Ponte & Gibbon, 2005), which significantly contributed to the methodology that underpin most studies in this cluster. Both authors are particularly active in research on Global commodity chain and Global value chain, two theories developed respectively by Gereffi (Gereffi, 1994) and Porter (Porter, 1990) to analyze social

networks that “emerge to coordinate highly diversified and internationally dispersed industrial manufacturing” (P.L. Taylor, 2005).

### ***Cluster 2 – Analysis and Criticism of FT integration in the mainstream market***

The second cluster can be interpreted as a further step towards a more detailed analysis of FT in the context of the free market. In particular, the consequences and challenges posed by mainstreaming strategies and shifting power relations within the fair-labelling network are addressed (Moore, 2004; Low & Davenport, 2005; Hira & Ferrie, 2006; ).

The main issues posed by corporations’ involvement are represented by the risks of marginalization of the original FT mission and principles (Low and Davenport 2005; Nicholls and Opal 2005), being absorbed by the market mindset (Low and Davenport 2005; Taylor, Murray and Raynolds 2005), being exploited by big corporations engaged in image-laundering processes (Renard 2003; Moore 2004), and by the loss of interest and trust in certifications by consumers, as well as producers (Reed 2009; Raynolds, Murray and Heller 2007; Nicholls and Opal 2005). The papers in this cluster analyze the competition between FT and competitors, which mimics some of the aspects of FT production, and through the use of rival third party certification systems (Murray & Raynolds, 2000; Raynolds, 2000; Moore, 2004; Reed, 2009). Frequently, these competitors are those entities that Raynolds defines as "(Those who) hold the bar on social and environmental conditions", as they usually have much less rigorous social standards or are not interested in continuous improvement of standards (Raynolds et al., 2007, p. 159). The second cluster treats other criticisms concerning corporation involvement related to governance and power issues within the FT network: (i) the need to create a wider consumer base with increased consumer awareness and better understanding of FT (Moore, 2004;

Nicholls & Opal, 2005; Hira & Ferrie, 2006), (ii) the shifting power relations within the FT labelling network in favour of big companies and retailers (Raynolds et al., 2004, 2007; Low & Davenport, 2005; Renard, 2005), and (iii) the lack of agreement over definitions of standards and certification procedures (Hira and Ferrie 2006).

Barratt Brown (1993) and Nicholls and Opal (2005) recognize the magnitude of the FT in reversing the damages created by the market through instruments offered by the market itself. Barratt Brown (1993) argues that only through the support and intervention of international institutions on market regulation will these forms of trade continue to expand, to the point that he proposes the establishment of "a new economic order composed of democratically controlled state marketing boards with grassroots control at all levels, and direct links between Northern consumers and Southern producers" (Fridell, 2007b, p. 47). On the other side, Nichols and Opal (2005, pp. 13–31) describe FT as "a consumer-driven phenomenon", "a neoliberal solution to problems with trade", "entirely a consumer choice (based) model", that "operates within the larger free trade model of unregulated international commerce". Emphasis on centrality of consumer demand and consciousness reflects the evolution of the practices of FT, as it shifted from being a proposal of an alternative system to the neoliberal political economy, to a form perfectly integrated in the context of the free market (Nicholls & Opal, 2005; Guthman, 2007).

### ***Cluster 3 – Consumers***

Documents of the third cluster focus on the consumer side from different points of view, such as marketing, geography, sociology, economy, etc. Studies in this cluster cover a wide range of aspects over FT consumption as they include both theoretical researches and experimental

studies (see Table 6). Indeed, the complexity and diversity of the factors that contribute to the formation of consumers' attitudes and preferences towards FT products make it necessary to use a wide spectrum of investigation in order to fully understand the mechanisms that underlie consumer choices (Shaw and Clarke, 2006).

It is worth noting that the most co-cited documents in the network belong to the branch of studies that uses economic approaches to examine whether or not consumers care about ethical issues, and whether consumers are receptive or not towards ethical certifications. These researches mainly used the WTP of consumers as a meter of judgement and offer encouraging results about the effectiveness of ethical labels. The major findings reveal that despite FT advocates being only a minority in the global scenario, the majority of consumers are very receptive towards ethical labels (De Pelsmacker et al. 2005), as they say they are willing to pay higher premiums, even higher than for organic products or other kinds of certifications, such as shade grown coffee and organic coffee (Loureiro and Lotade 2005).

One of the recurring topics among documents of the third cluster lies in the debate about the limitations of the traditional survey methods in consumer research, and the consequent call for the adoption of methods that can lead to reliable conclusions. As argued by Auger and Devinney (2007), results from surveys are very likely to overstate the importance of ethical issues and add spurious information into the measurement process. Studies drawing on economic approaches have used several methods to obtain trustworthy empirical insights on FT consumption, such as conjoint analysis (De Pelsmacker et al. 2005), contingent analysis (Loureiro and Lotade 2005), natural field experiments (Arnot, Boxall and Cash 2006), choice experiment (Auger et al. 2003) and quality approaches (de Ferran and Grunert 2007). These considerations are very important in the study of FT consumers and ethical consumption, as

they fit into the debate the need for new approaches that can address an issue inherent in a field that is "studying issues with inherent methodological complexities that make understanding human behavior even more difficult than normal" (Auger and Devinney 2007).

Past research has emphasized the crucial role that information plays in promoting the awareness and sensitivity of consumers to ethical issues, pointing out that in order to unfold accurate decisions, consumers should be fully informed (Carrigan & Attala, 2001; Barnett et al., 2005). However, it is argued that such a theoretical approach could lead to a distorted understanding of reality, as it generalizes and trivializes the hierarchies of values that guide consumer decision-making processes and their moral selfhood (Barnett et al. 2005). Other studies in the cluster inspect different aspects of FT consumers, such as sensitivity to price changes for consumers of FT coffee (Arnot et al. 2006) or the role of religion in FT consumption (Doran and Natale 2011).

#### ***Cluster 4 – Producers***

The documents of the last cluster focus on the impact of FT on producers and on the evaluation of its effectiveness in improving the well-being of small-scale farmers (see Table 6). If the long-term success of FT depends largely on consumer choices (Lyon 2006), producers' commitment to FT and their understanding of its principles remain two key elements to ensure their participation and commitment in the long term, and to achieve the "democratization of producers' organizations" fostered by FT (Murray et al., 2006). The risk that producers will turn to FT only in case of very low market prices, and then abandon it in more prosperous times, threatens the viability of FT in the long-term (Nicholls & Opal, 2005; Lyon, 2006; Murray et al., 2006).

Claimed benefits for producers to join the FT network are represented by guaranteed minimum price, pre-financing and long-term contracts, and price premium to be invested in the development and support of the community of producers (Taylor et al., 2005). FT strengthens the organizational capacity of producers, providing greater financial and organizational stability. It bolsters economic security and stability of producers' communities (Raynolds et al. 2004) and infrastructural investment capability, improves livelihood and administrative capacities, and increases the level of cooperation and political influence (Raynolds et al., 2004; Bacon, 2005; Murray et al., 2006; Arnould et al., 2009). Through participation in FT, producers acquire skills and knowledge that they can use also in non-FT markets.

Scientifically demonstrating any positive impact of the FT system on producers and their communities is definitely one of the most challenging aspects of FT research. This ambitious goal is made more difficult by the fact that producers sell their products in multiple markets, leading to greater difficulties in identifying the effects of participation in the FT on household incomes (Bacon, 2005; Calo & Wise, 2005; Bacon et al., 2008; Valkila, 2009).

Findings from the empirical studies in the network generally converge in supporting the positive impact of FT participation for producers in terms of income (Raynolds et al., 2004; Bacon et al., 2008; Arnould et al., 2009), while assessments in terms of social indicators such as education, health (Raynolds et al., 2004; Becchetti et al., 2006; Bacon et al., 2008; Arnould et al., 2009), individual and collective empowerment and capacity building (Raynolds et al. 2004) and environment (Bacon et al. 2008) are slightly more uneven.

In the words of Arnould and Bray, FT "is not a panacea" for third-world poverty (Arnould et al., 2009; Bray et al., 2002, p. 442), as some producers remain in poverty despite being

connected to FT markets, and FT will have to constantly face new challenges to succeed in its mission (Bacon et al. 2008).

## **Document bibliographic coupling analysis results**

Unlike co-citation analysis, which aims to detect papers that are considered important by researchers of a particular subject, bibliographic coupling analysis is based on the assumption that when two papers show similar bibliographies, they are likely to represent the same or at least related research topics. Whereas the co-citation analysis allowed us to identify the papers to which researchers on the topic of FT refer to, its results are nevertheless referred more to the past, and they fail to identify the most recent stream of research and current paradigms. To deal with this limitation we decided to use the technique of bibliographic coupling, and in particular to use it on a sample of the entire database composed by only the documents published from 2010 through 2015.

The full bibliographic coupling network (see Figure 4a) is composed of three clusters and its structure is quite similar to the one observed in the co-citation network. In addition, Figure 4b highlights the high impact articles in terms of coupling strength and citations received in order to improve the readability of the bibliographic coupling network.

Many of the most prominent authors of the co-citation network are also represented in the bibliographic coupling network, revealing a high level of specialization and experience of FT researchers. Differently from the co-citation analysis, bibliographic coupling reflects the different changes in the FT concept. Scholars have formalized definitions of FT and set up independent governance and monitoring organizations to oversee FT supply-chain agreements and the licensing of participants (Doherty et al. 2013). Indeed, the rapid expansion experienced



by FT in recent decades has introduced new compromises and tensions, and has exacerbated some of the existing ones (Raynolds 2012).

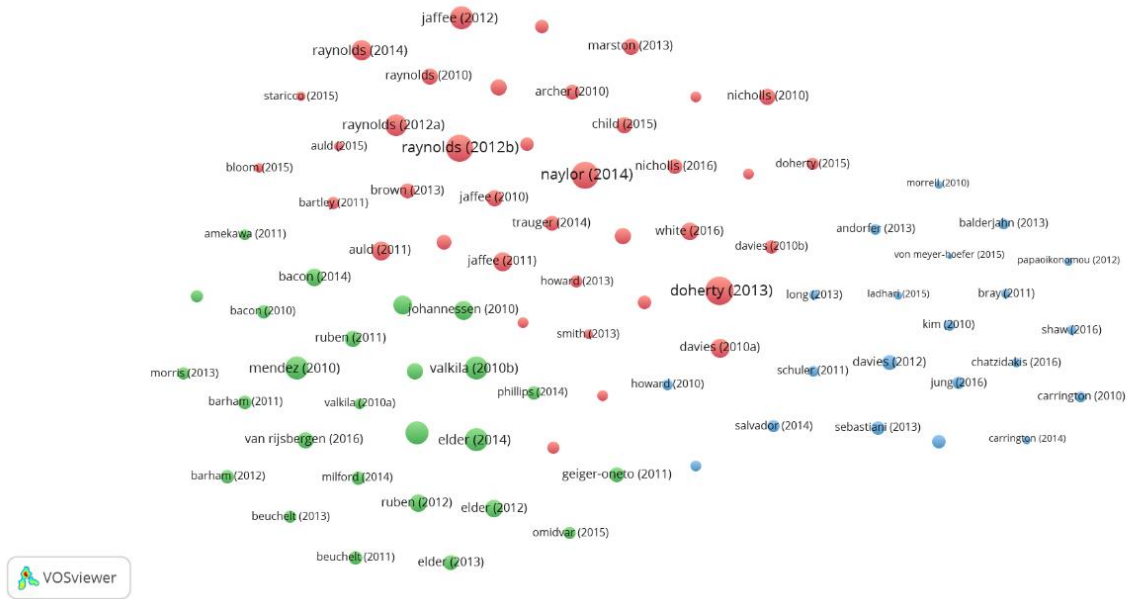


Figure 4a: bibliographic coupling network of references

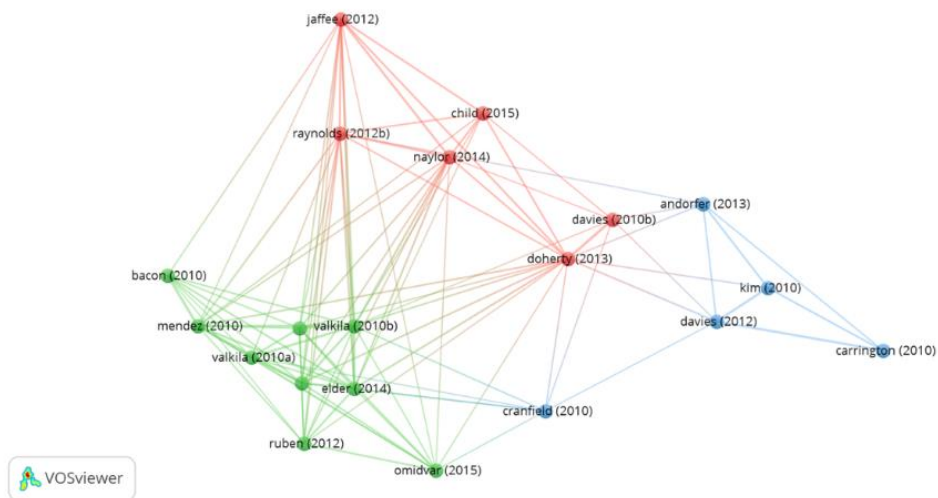


Figure 4b: detail of bibliographic coupling network of references

## ***Cluster 1 – Evolution and challenges of FT***

Despite the relatively heterogeneous body of literature that composes the first cluster, the analysis of the documents reveals that the central debate around the foundational and practical aspects of FT is still inevitably closely linked to the mainstream strategy and its consequences.

The rise in public awareness and the positive relationship between the adoption of the mainstream strategies and expansion of the FT market are proposed as clear examples of the success of FT in the last decades (Davies & Ryals, 2010; Reynolds, 2012; Doherty et al., 2013). However, there is an extensive literature inspecting the negative impacts of corporate engagement in the FT network (Jaffee, 2012; Doherty et al., 2013; Child, 2014).

Drawing on previous works on the global value chain model, Doherty et al. (2013) assess the degree of risk for dilution, co-optation and reputational damage for the different types of value chains which make up the vast majority of FT purchases today. In doing so, they emphasize the need for researchers to consider the heterogeneity of the FT movement, which is composed of many different forms of organization that should not be considered as a single entity.

The growing supply of products with ethical content, which has resulted in increasing number of ethical brands by firms or retailers (Doherty et al. 2013), as well as the nearly total integration of FT in conventional international markets (Naylor 2014), renders obsolete the narrative of FT being "in and against the market". Naylor (2014) debases this paradigm as an "illusion of an alternative economic imaginary", while Jaffee and Howard propose the recent developments within the FT network as an example of the risks about the limits of voluntary and non-state regulation, and of the consequences of "growth at any cost" strategy (2010,

p.395). It is also argued that consumers have lost that sense of political and collective action that motivated them in the early stages, i.e. during the 90s, to explore new ways to increase the number of FT consumers (Doherty et al. 2013).

Naylor (2014) challenges the dominant theoretical approach that underlies the FT movement and the research on this subject, meaning the dichotomy of "southern producers" vs. "northern consumers", as it perpetuates and reinforces, on a semantic level, the same disparity in power that FT seeks to equalize. FT research needs to re-think approaches that can more fully capture the heterogeneous group of FT actors who have different needs, interests and positions.

### ***Cluster 2 – Consumption***

Documents of the second cluster of the bibliographic coupling network deal with FT consumption. The research results confirm the need to overcome the dualistic narrative between pragmatic and radical consumers by giving greater attention to consumers' heterogeneity and facets (Cranfield et al., 2010; Kim et al., 2010; Andorfer & Liebe, 2012).

Heterogeneity of consumers is addressed both by comparing samples from various countries or cities (Kim et al. 2010; Cranfield et al. 2010), and widening the spectrum of the products analyzed, by investigating product categories other than coffee (Kim et al., 2010; Davies et al., 2012). Previous studies on FT coffee provide limited focus with little generalizability, compared to the wide range of certified products (Kim et al. 2010). To fill this gap, in recent times scholars have been exploring areas that have traditionally been poorly investigated by research, such as utilitarian product categories (Kim et al. 2010), luxury goods

(Davies et al. 2012) and the business-to-business context (Salvador, Merchant and Alexander 2014).

People tend to overstate the amount they are willing to pay when asked hypothetical valuation questions compared to when their actual money is involved, so that the hypothetical methods can lead to values two to twenty times greater than non-hypothetical valuation methods (Lusk and Shogren 2007). Therefore, intentions should not be considered a reliable proxy for actual consumer behaviours (Carrington et al., 2010; Andorfer & Liebe, 2012).

Since we should draw our conclusions from what people do, rather than from what they say, what is actually needed is an approach that combines the advantages of revealed and stated preference methods and is able to separate what people say from what they pay, i.e. using incentive compatible methods that provide incentives for individuals to truthfully reveal their values and impose a cost for non-truthful (or inaccurate) value revelations (Lusk & Shogren, 2007; Carrington et al., 2010; Andorfer & Liebe, 2012).

### ***Cluster 3 – Producers***

Documents of the third cluster focus on aspects related to the impact of FT certification on producers. Most of the researches rely on experimental case-based studies, reporting very modest or no effects on income, and conflicting results regarding indicators of health, education, and quality of life.

Ruben and Fort (2012) analyzed the FT impact for organic and conventional coffee farmers in Peru, and found no significant effect in terms of income. Conversely, Méndez et al. (2010) found a significant positive relationship between average sales price, savings, credit, risk acceptance and satisfaction with the cooperative service provision savings.

With regard to the non-monetary effects of participation in FT, the results are less inconclusive. Participation in FT has been related to better access to credit, higher investment propensity, organic specialization skills, higher levels of animal stocks (Ruben and Fort 2012), and increased participation of women in decision making. On the other hand, no connection between FT involvement and positive effects on household livelihood in terms of education and incidence of migration have been found by Méndez et al. (2010).

Faced with these conflicting results, it is difficult to assess the efficacy of FT in managing to realize its stated goals. Most marginalized farmers are not able to enter the network and certification because of the FT entrance requirements and the lack of support (Valkila et al., 2010; Omidvar & Giannakas, 2015), while cooperatives are not able to sell their entire production under FT conditions so that certified farmers are often forced to sell considerable portions of their production in the conventional market (Valkila et al. 2010; Méndez et al. 2010).

Some authors point their finger at the price mechanism of FT. For example, the FT minimum coffee price had not changed in the period 1988-2007 (Valkila 2014; Bacon 2010); indeed, over the same period, Bacon's findings reveal declining prices when discounted for inflation (Bacon 2010), fueling allegations related to corporate capture of FT (Jaffee and Howard 2010). The decline in the minimum price has shown that the same pricing system is closely linked to those market prices that it is intended to transform (Bacon 2010).

The concept of the social premium, despite recent efforts by a few authors, remains one of the least studied aspects of FT. There are structural problems in the evaluation of this premium price; it is difficult to separate the benefits derived from the premium from those due to other projects for rural development (Valkila and Nygren 2010).

## Discussion

Results reveal that the literature on FT has grown exponentially over the past 20 years, during which FT has been studied by different disciplines, which confirms its interdisciplinary nature. This study went beyond the identification of most productive actors and traditional citation counts, as it uses a bibliometric mapping software tool to visualize the intellectual structure of FT research. Scientific research of the FT theme mainly developed around four main themes: the philosophical foundations, criticism and challenges posed by the involvement of corporations, consumers, and producers. The same thematic groups can be identified both in the co-citation network, as well as in the bibliographic coupling analysis network of the most recent publications.

Literature in the early years of research has been strongly influenced by the debates about what should be the role and mission of FT in the scenario of a free global market. The recognition of the FT needs to cooperate with large corporations in order to continue to pursue its objectives and to shift the attention of research to more practical aspects and issues. Early research focuses mainly on coffee, while in more recent times the spectrum of investigation has been broadened to other certified products, both food and non-food. At the same time the implications of competition from other ethical certification schemes have been investigated in detail. On the side of consumers, this results in an attempt to achieve greater accuracy and generalizability of the results, by using new methodologies to investigate consumer preferences for certified products and WTP, and by the attempts to use incentive-compatible methods. On the side of producers, research attempts to identify the reasons for the inconclusive results on FT effectiveness and find new ways to assess the effects of the certification on producers.

Findings also suggest that FT as a unique business strategy and/or as a differentiation opportunity for producers, as well as the change in the business attitude to explore FT branding, are themes that have been only partially analyzed and deepened.

Like any evolving field of research, it is unsurprising that the documents of the co-citation analysis had cast a slightly less critical eye over the FT movement than more recent studies. However, despite the critical analysis and resizing of potentialities, authors converge on the need for more consideration of social and economic justice in international trade, and that third-party certification has a key role in ensuring that these goals are addressed. As scholars are confident about the contribution that FT can add to the broader scenario of strategies to enhance living conditions and labour rights for disadvantaged producers and labourers (Méndez et al. 2010), there is also a general agreement on the need for a profound reform of the FT system. FT should address all these issues through a long-term strategy re-organization, involving a participatory representation by smallholder cooperatives, alternative trade organizations and development-oriented civil society movements (Bacon 2010). At the same time, research should deal with those aspects of FT that until now have received little attention, such as those related to the premium price and the use made of it, to the new organizational forms of certified producers within the FT network and to the extension of the analysis to the whole range of certified products.

## **Conclusion and limitations**

This analysis of the literature through bibliographic methods has highlighted the salient aspects of FT research, from the beginning to the present day, and how the challenges and evolution that FT has been facing over the years have influenced the research and perspectives of

scholars. Compared to the earliest years, when buying FT products was seen as a political statement and the FT network was meant to challenge the neoliberal economic system, FT is now working in close contact with the biggest corporations in the world and certified products can be found on the shelves of supermarkets. During this time, the debate on the engagement of FT by large corporations and the collapse of the model of alternative trade organizations have always remained a central element both within the movement and in scientific research.

Though many years have passed since the participation of corporations in the FT network, the most recent researches do not provide a definitive verdict on the effects of the mainstream strategy. There is no doubt that the implementation of this strategy has been a necessary choice, in terms of expanding the market and the brand, but it is argued that the benefits have not been equally distributed among the actors of the network, as many producers still live in conditions of extreme poverty. However, despite the fact that the evidence base is still incomplete, there are several instances of greater income stability and higher earnings for producers who engage with the FT network, as well as many other indirect but still important benefits.

As for the state of research on FT, two elements emerge: the first is the low reliability of results on consumers obtained using methods that are not "incentive compatible" or with low levels of representativeness of the samples. This necessity is not new, Ulrich and Sarasin (1995) stated that, with regard to ethical issues, research runs the risk of losing relevance, as the answers are never reliable due to different kinds of biases (Ulrich and Sarasin 1995). As stated by Andorfer and Liebe (2012), scholars have just begun to understand and explain individual FT consumption, and "research on FT consumption would benefit from both a multiple-motives and a multiple-methods perspective". In order to overcome these problems,



"incentive-compatible measures of FT consumption intentions and behavior should be used in empirical studies whenever possible" (Andorfer and Liebe 2012), by comparing different theories and methodologies.

On the side of producers, conflicting and sometimes confusing results concerning the effects of FT, undermined by a number of uncertainties, make it difficult to compare or draw any general conclusions based on the actual evidence base. The question of whether FT producers are better off than their counterparts is very complex and cannot be confined only to questions of price and income differentials. Still, it is possible to draw the conclusion that a comprehensive assessment of the impact of FT should not only account for monetary income, but also for a wide set of welfare, empowerment and quality of life indicators. Furthermore, research should also consider the opinions and perceptions of the participants in the network, as well as their individual skills and performances over time. In addition, limiting the value chain to the study of coffee and some cases of a few other certified products, the knowledge on the side of producers is limited in many directions. Discordant results demonstrate the complexity in finding information about the effectiveness of FT and represent an indicator of the limited awareness of the FT system mechanisms and limited identification with FT by producers (Valkila & Nygren, 2010; Valkila, 2014), two issues in which FT should invest more effort.

Bibliographical methods are not without limitations. First of all, the tendency of authors to cite their own works can distort the network of citations and give greater emphasis to the most prone authors of this practice. However, the effects of this distortion may be limited when the number of authors is sufficiently high, compared to the number of articles published, as in the case of the FT literature. Second, highly ranked journals tend to be cited more by authors, and this may result in overestimating the contribution of these journals compared to the lower

ranked ones. Third, the time between the publication of an article and the moment when that article is cited leads to a greater weight on earlier publications, that – being available for a longer time – received more quotes compared to more recent research. Another limitation is regarding the source from which the data are collected, in this case the Web of Knowledge Core Collection, which is almost entirely composed of articles in the English language. Expanding the spectrum of publications even to non-English articles could actually return more complete results. Bibliometric analysis suffers from several limitations that should be considered in the interpretation of the results, the most important of which are introduced below. First of all, there are several reasons why a document may be cited or not, and a large number of citations does not imply quality. Indeed, bibliometrics do not measure quality and it is important to analyze the documents by combining bibliometric and qualitative methods in order to evaluate the quality and contributions of works. Then there are some limitations related to the structure and functioning of the world of scientific publishing, such as the advantage of experienced researchers over early career researchers, and of long-running over new journals, the different rates of publishing between different fields of research and WoS limited coverage of non-English language publications and book publications. Finally, although bibliometric methods represent very efficient tools to explore a research scenario, they can be very time-consuming when applied to very productive research areas, as they require reading a large number of articles.

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# **3 - The entrepreneurial and social goals of Fairtrade. An analysis of the revenues and the social premium**

## **Introduction**

In the past few decades the global food production system witnessed the emergence of many different certification body standards, each one with its own trajectory and focus, attempting to address the negative features that underlie global food supply chain (Grunert et al., 2014). From organic, biodynamic, UTZ Certified, Child Labor Free, Animal Welfare Approved and Fairtrade, there are standards and certifications covering for almost every ethical issue involved in the production of food, like environment protection, health, social justice and animal welfare (Dragusanu et al., 2014). In this scenario, Fairtrade (FT) is the most recognized certification system worldwide dealing with social justice and fairness in trade today (Dragusanu and Nunn, 2014), which attempts to address one of the most ambitious goals: to enable greater producers' control and fair conditions over the trading process, proposing "an alternative approach to conventional trade based on a partnership between producers and traders, businesses and consumers, that seeks greater equity in international trade" (Fairtrade International, 2017a).

Although there is an extensive scientific literature on FT, we still know little about the effectiveness and the impact of FT certification on marginalized producers and their communities (Ruggeri et al., 2018; Le Mare 2008), and in particular about the measures and the modalities in which the participation in FT benefits producers organizations (Ruggeri et al., 2018). Attempting to assess FT impact is a difficult objective. The complexity and heterogeneity

of stories, organizations and products that compose FT limit generalizations and has compelled researchers to contextualize each individual experience (Raynolds and Bennet, 2015; Terstappen et al., 2013). Indeed, research has been traditionally based on local case studies, and data on a larger scale have rarely been analyzed (Ruggeri et al., 2018). Nowadays, FT encompasses 1.65 million farmers and workers, organized in more than 1200 producer's organizations, spread across 74 countries worldwide, producing goods that are sold in over 125 countries through different types of distribution channel (Fairtrade International, 2015). The large number of published researches on the impact of FT that will be reviewed in the next sections reveal that the benefits of involvement in the FT system depend on many factors internal and external to organizations and cannot easily be generalized and extended to the entire network of producers (Ruggeri et al., 2018).

The aim of the present study is to return a comprehensive image of the FT producer organization network, focusing on the allocation among organizations of the two main economic aspects: the revenues, both as total earnings and as earnings deriving purely from participation in FT, and the social premium. To our knowledge, no research has yet studied how producers' organizations differently benefit from participating in FT in relation to intrinsic and extrinsic characteristics as the type of organization, the duration of the involvement with FT, the type of product, the geographical location or the approach that organizations themselves have towards the certified market. Indeed, FT can represent the only sale channel for organizations, which in some cases manage to sell the integrity of their production on the FT market, as well as representing an alternative market outlet through which organizations sell just part of their production. This does not mean that we are trying to identify an "ideal type" of producer

organization, rather we try to document the heterogeneity of the experiences of the FT network of suppliers in relation to the income they make by joining FT.

The novelty of this study is that it analyzes the features of FT affiliated organizations from the comprehensive dataset on certified producers all over the world collected by the Monitor, Evaluation and Learning (MEL) program, that has been provided to our Institution by Fairtrade International. The database comprises the totality of certified producers, including all kind of certifiably organizations, countries and products, helping to overcome the sectorial view of previous literature. This research develops directly from the partnership between the no-profit organization Fair Trade Italia and the University of Milan, to provide new information about the allocation of the revenues and the social premium within the FT network of producers' organizations, thanks to a wide basis of data, never analyzed before. Studying the allocation of the revenues and of the social premium payed by FT to producers' organizations in a more analytical way, with respect to the stated goals of FT and to the previous findings from literature, can improve knowledge about the effectiveness of the FT system on the organizations and their communities, and the efficacy of bottom-up development strategies.

As FT is increasing its popularity among Northern consumers (C. M. Bacon, 2010, Reynolds & Bennets, 2015), a rigorous and comprehensive assessment of its impact on the producers is more than ever crucial for FT at least for two fundamental reasons (Arnould et al., 2009): 1) to build and strengthen a relationship of trust with consumers, producers and companies; 2) to improve the FT system, identifying both the strengths and aspects that may be enhanced in order to better support producers and increase effectiveness in achieving FT goals. Such a demonstration may also bolster support for fair-trade policies and programs (Arnould et al., 2009).

## **Fairtrade principles and standards**

Fair Trade advocates refuse the basic Neoliberal assumption that trade liberalization will inevitably increase social and environmental benefits for all the actors involved in global trade, and assert that North–South trade relations are plagued by power inequalities and exploitation (Bacon, 2005; Reynolds and Bennet, 2015). Despite Fairtrade International had to make some compromises over the years in order to adapt to the times and continue its business, including an ever-growing number of producers and consumers (Le Mare, 2008), FT's vision is that of a different global trading system, in which sustainable development and social justice are at the core of practices and structures (Fairtrade International, 2011). Beyond some overly enthusiastic statements (Ruggeri et al., 2018), FT aims at empowering the most disadvantaged producers in developing countries to improve their own businesses through international market access and to enable them greater control over the supply chain (Reynolds, 2012). It does so by imposing compliance with a set of social, environmental and organizational standards that govern the production phases as well as the subsequent steps of exchanges between traders and producers (Reynolds et al., 2007). This latter aspect is not trivial, as it allows to address that power imbalance in favor of the buyers that characterizes North-South supplier-buyer relations (Nicholls, 2010; Nicholls and Opal, 2005). The basic principle of FT is the same that underlies to all certification systems: when a product presents the FT mark it means that it complies with the standards set by Fairtrade International. In exchange for the compliance with the FT principles, many studies found that consumers are willing to pay an increase on the market price for certified products (Arnot et al., 2006; Becchetti et al., 2006; Becchetti and Rosati, 2007; De Pelsmacker et al., 2005; Loureiro and Lotade, 2005).



FT's most well-known and most disputed tool is probably the minimum price floor. The FT minimum price is meant to cover the average costs of sustainable production, and whenever the global market price falls below it, buyers pay to producers this floor price (Fairtrade International, 2017a). This instrument has received considerable amounts of criticism for creating artificially high prices, distorting the market mechanisms of supply and demand equilibrium in a free market (Craxton and Rathke, 2011; Mann, 2008). It has been argued that when the price floor is higher than the market equilibrium price, supply of the production exceeds its demand, and producers are not able to sell their entire production through the FT channel, the remaining part of their output being sold at the lower market price while incurring expenses related to certification standards (de Janvry et al., 2015).

The second element of the pricing system, albeit less known, is the FT social premium. The social premium is an extra amount of money paid to the producer organization by the FT payer (usually the exporter or the importer), usually set somewhere between 5-30% of the Fairtrade minimum price (Fairtrade International, 2011). Both the minimum price and premium differ for conventional and organic products. The premium is paid on the top of the volume of FT products sold and goes into a communal fund for workers and farmers to be reinvested in social or development projects. Although FT does not impose any specific use of the social premium, it is intended to be a specific tool for the economic, social and environmental development of producer organizations and communities, and its management must be made through transparent, participative, and democratic processes (Fairtrade International, 2011; Fairtrade Labelling Organizations International, 2006). Although there is no agreement on this issue, several authors have pointed out that the activities subsidized by the social premium are the most effective tool put in place by FT (Nicholls and Opal, 2005; A. M. Smith, 2009).

Beyond the system of payments to producers, the key objectives of the FT standards include establishing long-term trading partnerships between the actors in the network, enabling pre-financing contracts and guaranteeing access to financial, technical and organizational support (Fairtrade International, 2017b). In addition to these benefits, that might be referred as direct, there are also indirect benefits for producers resulting from participation in FT, as learning new skills, organizational and management capacity building and greater ability to entertain business relationships (Arnould et al., 2009; Bacon, 2005; Murray et al., 2006; Raynolds et al., 2004). Fairtrade International also works in many programs to promote gender equality, bolster the incomes of marginalized women workers and producers, prevent and eliminating all forms of Forced Labor, Child Labor and human trafficking, and reducing environmental impact (Fairtrade International, 2017a; World Fair Trade Organization et al., 2011). FT standards are declined according to the different product categories, to the roles within the supply chain - producer organization or trader - and to the type of organization of producers. The target of Fairtrade has traditionally been small-scale farmers' cooperatives (SPO) due to the high number of organizations of this type in developing countries and to the innate predisposition of this organizational form to being managed in a democratic way (Becchetti and Huybrechts, 2008; Fairtrade International, 2017b). Every small-scale producer of SPOs have a voice and vote in the decision-making process of the organization, and profits should be equally distributed among them. The inclusion of different types of organizations is a relatively recent addition to the system (Fairtrade International, 2017b; Raynolds, 2017). Hired labor (HL) standards apply to companies that are not membership-based (farms, plantations, factories, manufacturing industries, etc.), while contract production standards are applied to small producer organizations that do not have a formal structure or legal status (World Fair

Trade Organization et al., 2011). These standards include, among others, the payment of decent wages, the prohibition of forced labor and child labor, trade union freedom, and the adoption of health and safety measures in favor of workers (World Fair Trade Organization et al., 2011). The opening of FT certification to plantations and farms had required different specific standard to be enhanced and has been greeted with skepticism by a part of the FT advocates, who have interpreted this move as an abandonment of the original target of the movement, the most marginalized and small producers' organizations (Raynolds, 2017). Similarly, collaborations with big corporations nourished criticism regarding dilution of the label and the empowerment of roasters and retailers instead of producers (Valkila et al., 2010).

## **Impact of FT**

The impact of FT certification on producers has been analyzed in several studies over the years. However, there is still no definite answer to the question whereas FT delivers its core message or not (Le Mare, 2008; Nelson & Pound, 2009, Terstappen, Hanson, and McLaughlin 2013), as we do not yet have a complete picture and unclear and sometimes conflicting results are reported. Studies on FT impact have been traditionally related to regional or local scale. Furthermore, research has been geographically concentrated in Central America and West Indies, and mainly focused on three products: coffee, bananas and cocoa (Le Mare, 2008; Ruggeri et al., 2018; Terstappen et al., 2013). Most of the empirical researches employ direct investigation techniques as surveys, questionnaires and focus groups, usually involving farmers (Arnould et al., 2009; Bacon et al., 2008). Griffiths (2012) found significant methodological weaknesses in many impact studies, as for the identification of external inputs

(Valkila, 2009), the selection of the cooperatives for case studies (Alastair M Smith, 2009), measurement of labor inputs and the lack of adequate control groups and data over time.

Despite most of the research agrees that FT producers receive higher income than conventional trade farmers (Arnould et al., 2009; Beuchelt et al., 2011; Dragusanu and Nunn, 2014; Méndez et al., 2010; Ruben and Fort, 2012; Weber, 2011), results present considerable differences (Mayoux, 2012). As pointed out by Schmelzer (2006), FT income effects are remarkable if considered on an aggregate level, but are far more complex by analyzing organizations specifically, or at the household level. Ruben and Fort (2012 ) found significant wealth effects but only small income gains for organic and conventional coffee farmers in Peru who adopted the FT certification. Dragusanu & Nunn (2014) found an increase in the income among certified producers, but only for the most skilled growers and farm owners. Critics have argued that most of the certified products come from the wealthiest producers' organization and from relatively wealthy countries, by doing so FT would reduce international demand for products from the poorest countries (Sylla, 2014). Méndez et al. (2010) found positive effects of the involvement in the FT market, but the average volumes of coffee sold by individual households were low, and many certified farmers did not sell their entire production at certified prices. This last aspect is reported to cause a serious decrease in producer organizations' net revenues, as they incur costs for meeting the FT standards (Breimer and Vaal 2012; Méndez et al. 2010) and because strong concentration on FT production leads producers to neglect other income-generating activities ( Ruben, Fort and Zúñiga-Arias 2009). Literature also reports cases in which organizations with a longer involvement in the network have bigger control in the FT market (Valkila & Nygren, 2010), resulting in uneven distribution of market shares between producers. This indicates that there might exist unfair distribution of FT volumes that

can be sold between producers (Valkila & Nygren, 2010). Related to this, a relevant aspect that has never been addressed in literature is to evaluate whether selling a larger share of production actually translates into higher total revenues for producers' organizations, or if organizations that sell only a small portion of their production at FT conditions are able to obtain higher overall revenues by selling their products on other markets. Similarly, the criticisms that have been made to FT due to the opening to hiring plantations and farms assume that the most marginalized groups in developing countries are small farmers rather than hired workers, and that openness has shifted the balance in favor of the latter.

Other results point out that the minimum price is effective only when the market equilibrium price is low (Parvathi and Waibel, 2016, 2013; Valkila and Nygren, 2010). Janvry et al. (de Janvry et al., 2015) found evidence that the net benefit of the certification is negative when the market price is higher than the FT minimum price, and some studies have shown that the true price received by farmers is sometimes lower than the FT minimum price (Bacon, 2005; Utting-Chamorro, 2005). Considering coffee, the most traded product by Fair Trade, the minimum price didn't change between 1988 and 2007 (Bacon, 2010; Jaffee and Howard, 2010; Valkila, 2014), and over the same period, Bacon's findings reveal declining prices when discounted for inflation (Bacon, 2010), fueling allegations related to corporate capture of FT (Jaffee and Howard, 2010).

Even if the social premium is recognized as one of the key benefits of participating in FT certification, it has been often overlooked in impact studies and there is little analysis of its allocation within the network of producers and the resulting investments from it (Ruben & Fort, 2012; Valkila, 2014). This is mainly due to the difficulty in obtaining FT social premium data and in the lack of knowledge about the FT mechanisms among farmers. Furthermore, FT funds are

often combined with fundings from donor support and development projects (Elder et al., 2012; Valkila and Nygren, 2010), which complicates the identification of the effects of the different sources of the money. Therefore, the efficacy of the premium itself is still uncertain (Nelson and Pound, 2009), but its potential is undeniable. Valkila (Valkila, 2014) argues that the premium price has a greater potential and effectiveness than the minimum price in addressing inequalities. The social premium can benefit the whole communities of producers, expanding the range of action of FT outside the circle of certified farmers (Ronchi, 2002; Ruben and Zuniga, 2011). Valkila and Nygren (2010) found that the premium price for coffee had been used for a wide variety of purposes as training on production techniques and educational programs, building of infrastructures as roads, schools and community building, improving the healthcare system or covering for the costs of certification.

Most of research on FT impact agree that considering the benefits of FT participation exclusively in monetary terms would limit the comprehension of the potential of the system (Raynolds et al., 2004, Raynolds 2002; Parvathi and Waibel 2016). Benefits derived from participation in FT are not limited to income effects, but also include improvement of organizational abilities, access to market, quality improvement, technical support, inclusion and network development (Arnould et al., 2009; Parvathi and Waibel, 2016; Ruben et al., 2009; Ruben and Fort, 2012; Valkila and Nygren, 2010; van Rijsbergen et al., 2016). Literature examinations report disaggregated data on social issues as gender equality, health and labor, expressing the need for further research on the features that are explicitly included among the core objectives of the FT mission (Fairtrade International, 2017b; Le Mare, 2008; Nelson and Pound, 2009).

From this multitude of results and issues, the profitability of the involvement in FT by producers in developing countries is not homogeneous for all the organizations worldwide, but that there are specific case differences that with the available data are difficult to grasp and to abstract to generalizations valid for the entire network of producers.

## Data

Since 2007, FLO has been investing in data collection as part of its Monitor, Evaluation and Learning (MEL) program. The MEL program oversees the collection of regular monitoring data from all producer organizations holding FT certification, with the aim to support internal learning and improvement and to collect a wider basis of evidence of FT effectiveness in supporting sustainability goals (Fairtrade International, 2017c, 2014).

Data covers all products and countries where certified producers' organizations are present: it comprehends information for 802 producers' organizations and plantations, distributed in 77 developing countries during the year 2015. Through the analysis of these data, we aim to provide useful information to respond to some of the longstanding disputes concerning the FT system highlighted in the literature. We investigate if there are significant differences in the allocation of the revenues and social premium within the network of FT producers depending on the type of organization (SPOs and HL), the country income level<sup>1</sup>, the duration of the involvement in the FT system and the main product. We also try to identify some characteristics of certified producer organizations that benefit most from the participation

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<sup>1</sup> World Bank analytical classification: low-income economies are defined as those with a GNI per capita, of \$1,025 or less in 2015; middle-income economies are those with a GNI per capita between \$1,026 and \$12,475; high-income economies are those with a GNI per capita of \$12,475 or more. Lower-middle-income and upper-middle-income economies are separated at a GNI per capita of \$4,036

in FT, namely the total volume produced (as a proxy of organizations' scale), the share of females among the members/hired workers, the share of organic production, the yield and the ratio between the number of members (or workers, for HL) and the cultivated hectares. Furthermore, the effects of the spread in the FT volume share of total sales by producers were investigated.

## Methods

To provide new information on FT efficacy to improve poor farmers' standards of living and to study the dynamics of the distribution of the revenues and the social premium within the FT network of producers organizations, kernel-based regularized least squares (*KRLS*) was used (Hainmueller and Hazlett, 2014).

*KRLS* is a machine learning method introduced by Hainmueller and Hazlett (2012, 2014) which allows to perform regression analysis where the correct functional form is unknown, avoiding strong functional form assumptions. *KRLS* method assumes that observations with similar values of their variables ought to have similar outcomes on average and can learn the non-linear relationship from the data to attain an improved model fit (Ferwerda et al., 2017; Hainmueller and Hazlett, 2014, 2012). *KRLS* method does not assume marginal effects of the explanatory variables to be constant, but it derives estimates of the response from an N-dimensional space using information about similarity to each observation, with a preference for less complicated functions (Hainmueller and Hazlett, 2012). The estimator yields pointwise estimates of partial derivatives that characterize the marginal effects of each independent variable at each data point in the covariate space. Average partial derivative can be interpreted like beta coefficient from linear regression (Hainmueller and Hazlett, 2012). As for binary



variables, *KRLS* procedure detects binary variables and calculate the first-difference estimate. By observing the distribution of pointwise estimates, it is possible to examine the marginal effects of each predictor and how the marginal effects vary across the covariate space. examining the distribution of the marginal effects can lead to interesting insights about non-constant marginal effects. In some cases, it is possible that a covariate has uniform marginal effect, while in other cases the effect might be highly heterogeneous (e.g., the marginal effects are negative in some parts of the covariate space and positive in other). Prior to analysis, variables were standardized with respect to the product by subtracting the sample means and dividing by the sample standard deviations. *KRLS* minimize a Tikhonov regularization problem to find the best fitting function by minimizing with a square loss using Gaussian Kernels as radial basis functions. Let  $X^{(d)}$  be a variable such that  $X = [x_1 \dots x_d \dots x_D]$ . Then, for a single observation,  $j$ , the partial derivative of  $y$  with respect to variable  $d$  is estimated by:

$$\frac{\partial \widehat{y}}{\partial x_j^{(d)}} = \frac{-2}{\sigma^2} \sum_i c_i e^{-\frac{\|x_i - x_j\|^2}{\sigma^2}} (x_i^{(d)} - x_j^{(d)})$$

*KRLS* pointwise partial derivatives may vary across every point in the covariate space. One way to summarize the partial derivatives is to take their expectation. *KRLS* estimate the sample average partial derivative of  $y$  with respect to  $x^{(d)}$  at each observation as:

$$\frac{1}{N} \sum_i \left[ \frac{\partial \widehat{y}}{\partial x_j^{(d)}} \right] = \frac{-2}{\sigma^2 N} \sum_j \sum_i c_i e^{-\frac{\|x_i - x_j\|^2}{\sigma^2}} (x_i^{(d)} - x_j^{(d)})$$

*KRLS* also derives the variance of this quantity and compute the pointwise and the sample-average partial derivative for each input variable together with standard errors. This type of

analysis has the double advantage of guaranteeing an easy interpretation of results like OLS regression, allowing for more complex interpretations to examine non-linearities and heterogeneous effects (Hainmueller and Hazlett, 2012).

Fractional response model regression is a methodology introduced in 1996 that is used when the dependent variable is greater than or equal to 0 and less than or equal to 1, usually for outcomes such as rates, proportions, and fractional data. It uses a logit model for the conditional mean. (Oberhofer and Pfaffermayr, 2012; Papke and Wooldridge, 2008, 1996). It assumes the availability of an independent (not necessarily identically distributed) sequence of observations  $\{(X_i, y_i) : i = 1, 2, \dots, N\}$ , where  $y_i$  is bounded between 0 and 1, limits included, and  $N$  is the sample size. The asymptotic analysis is carried out as  $N$  tends to infinite. The model for the conditional expectation of the fractional response variable is that, for all  $i$ :

$$E(y_i | X_i) = G(x_i \beta)$$

Where the  $k \times 1$  vector  $x_i$  refers to the explanatory variables of observation  $i$  and  $G(\cdot)$  is a known function satisfying  $0 < G(z) < 1$  for all  $z \in U$ , typically the logistic function  $G(z) = A(z) = \exp(z) / [1 + \exp(z)]$  (Papke and Wooldridge, 1996). This ensures that the predicted values of  $y$  lie in the interval  $(0, 1)$  and that the equation is well defined even if  $y_i$  can take on 0 or 1 with positive probability (Papke and Wooldridge, 2008, 1996).

The estimation procedure is a particular quasi-likelihood method, the Bernoulli log-likelihood function, given by:

$$l_i(b) = y_i \log [G(x_i b)] + (1 - y_i) \log [1 - G(x_i b)]$$

Papke and Wooldridge's procedure (1996) provide valid (robust) estimators of the asymptotic variance of  $\beta$  based on the well-known sandwich formula (see Cameron & Trivedi, 2005) and the non-linear conditional mean (.)G.

Shannon entropy is an index aimed at calculating the probability that a certain random output happens to be different from the previous one. It considers the number of categories and their relative abundance and is calculated as follow being  $n$  the single output and  $N$  the total sample:

$$H = -\sum \left(\frac{n}{N}\right) * \ln\left(\frac{n}{N}\right)$$

Shannon entropy is used to calculate the degree of expenditure diversification: the lowest the index, the more concentrated the expenditure will be, with 0 corresponding to all premium spent into a single category.

## **Descriptive statistics**

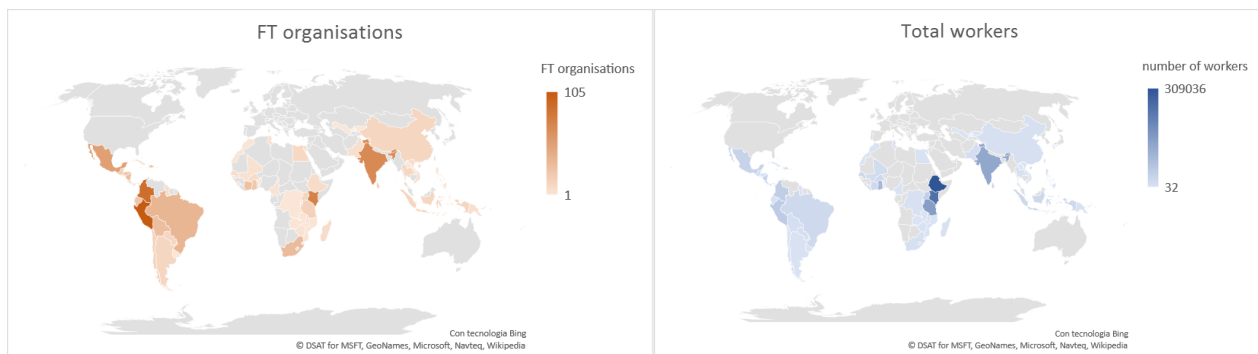
For the main part, FT operates with SPOs, which altogether represent hundreds of thousands of farming families and more than the 90% of the total number of farmers involved in the FT network. HL organizations represent around 10% of the sample and only deal certain products: bananas, fresh fruit, tea and spices. In terms of number of workers, HL represents only the 8% of the network. Factories are present in Middle East (Pakistan) and gold miners are certified in South America (Peru), but they represent a small minority of the sample and they have been excluded from the regression model. Almost half of the organizations are in Latin America and the Caribbean, one third in Africa and the smaller part in Asia and the Pacific. Considering all organizations worldwide, the greatest concentration of producer organizations is in upper-

middle income countries (according to the World Bank analytical classification), the number decreasing along to the decreasing of the level of the income category. Inspecting the distribution in the different macro-regions, we realize that this trend is mainly due to Latin America and the Caribbean, while in Africa and Asia most producers are in so called lower-middle income counties.

Table 1: distribution of FT producers' organizations according to the World Bank classification

Income category	Africa and the Middle East	Asia and Pacific	Latina America and the Caribbean	Total
High income	0%	0%	5.1%	2.83%
Upper middle income	25.69%	19.42%	72.04%	50.45%
Lower middle income	46.25%	80.58%	22.45%	38.44%
Low income	28.06%	0%	0.41%	8.28%

Figure 1 Geographical distribution of FT producers' organizations and geographical distribution of FT members/workers



The distribution of workers in figure 2 shows that most of the farmers involved in the FT market are in Africa (64%), while only 19% and 16% are respectively in Latin America and Asia. This is mainly due to the large plantations of tea in Africa, that hire large numbers of workers. The countries with more producer organizations are Peru, Colombia, India, Mexico and Kenya, while the largest number of individuals are in Ethiopia, Kenya, Tanzania, India, Ghana, Peru and Colombia.

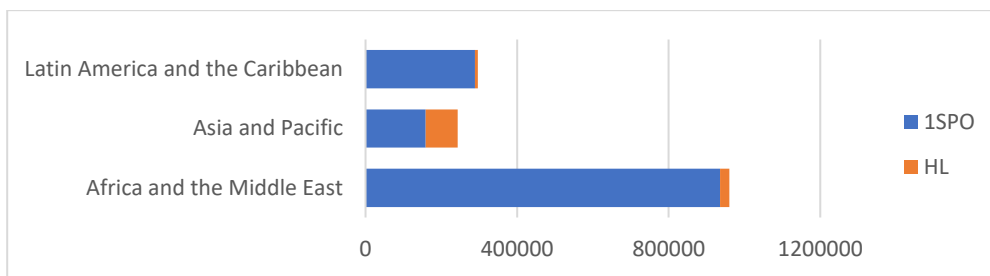


Figure 2: distribution of the number of workers over the three macro regions

There are over 30,000 FT certified products on sale worldwide, and there are standards for both food and non-food products: the first category includes bananas, cocoa, coffee, dried fruits, fresh fruit and vegetables, honey, juices, nuts, oil seeds, oil, quinoa, rice, spices, sugar, tea and wine; the former regards beauty products, cotton, flowers, ornamental plants and sports balls. In recent times, projects on FT mining products like gold, silver and platinum have been launched. Figure 3 shows the distribution of organizations over products and the three different macro-regions where FT operates.

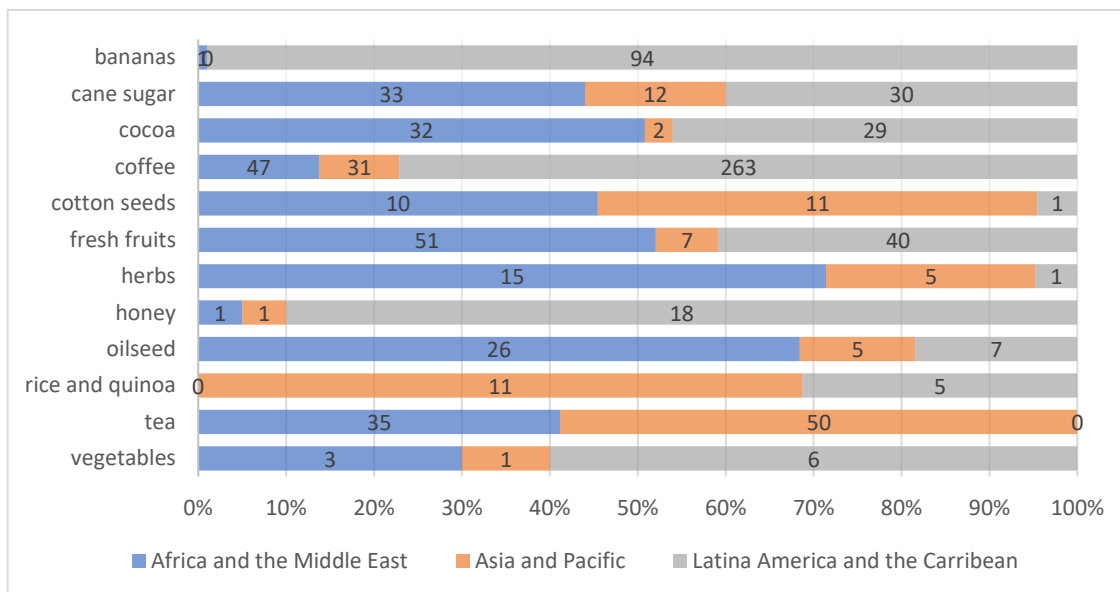


Figure 3: distribution of organizations over the three macro regions and products

Labor intensity differs according to products and macro regions: in Asia and Africa the ratio between the number of workers and the extension of the cultivated land in hectares is respectively 3.4 and 2.6, in Latin America the ratio drops at 0.64. In SPOs, only the 18% of members is represented by women, reflecting the difficulties for women in developing countries to gain secure property right on land tenure and business. When HL organizations are considered, women represent more than one third of the workforce. Many of the women in the FT network are employed in tea plantations. The percentage of women is higher in low income countries than it is in the richer ones. (17% vs 25%). Part of the production is cultivated using organic methods, as fostered by the principles of the organization. When all the products are considered altogether, 55% of the organizations have at least some organic production and 45% of production is organic. This is the case for the most traded products in the FT supply chain, namely bananas, cane sugar, cocoa and coffee. Still, percentages of organic volumes vary greatly depending on the product as reported in figure 4: for example, the 88% of the

volumes of rice and quinoa and the 78% of herbs are organic, while organic represents only the 10% of vegetables and the 22% of fresh fruits. There is also a difference in the percentages of organic production according to the type of organization: the mean for SPO Standard is 49.37%, this value falls to 25.76% for HL Standard.

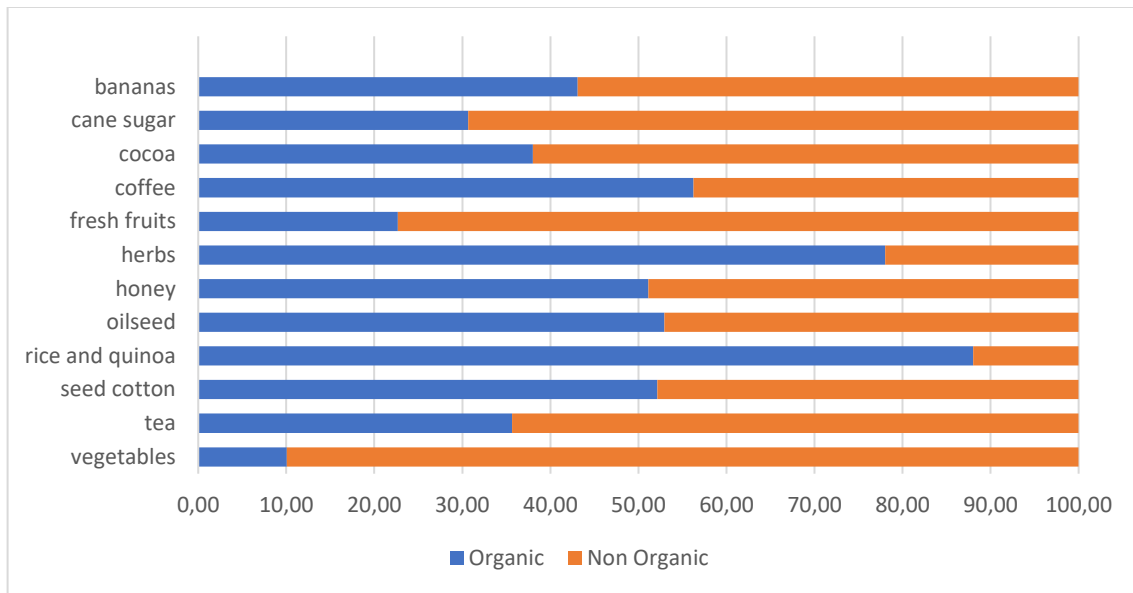


Figure 4: percentages of organic and conventional volume, by products

Not all certified producers sell their whole production through the FT channel, mainly due to the oversupply of the FT market (De Janvry et al., 2015; Valkila & Nygren, 2010). On average, organizations sell 50% of their production under FT conditions, but there are substantial differences depending on the type of organization and the different products. The average percentage of production sold through the FT market is 32% for HL and 53% for SPOs. For bananas, cane sugar and coffee, the percentages are around 60%, while for other product as tea, vegetables and fresh fruits they decrease to 18 - 30%. Similarly, on average SPOs sell to FT the 54% of their total production, while in the case of HL the percentage falls to 34%. Strong

regional differences exist: Latin America and Caribbean commercialized through FT for more than 60% of their volume yearly, while African producers only the 36% and Asia the 41%.

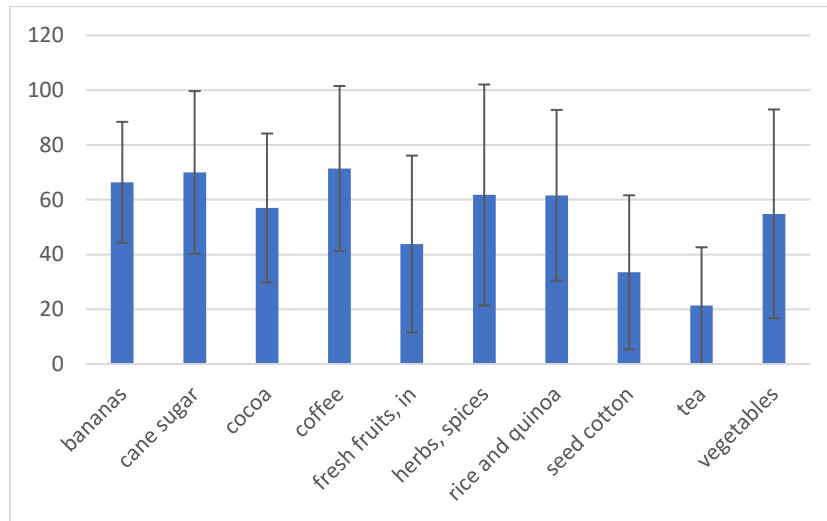


Figure 5: share of volume sold through FT, by products

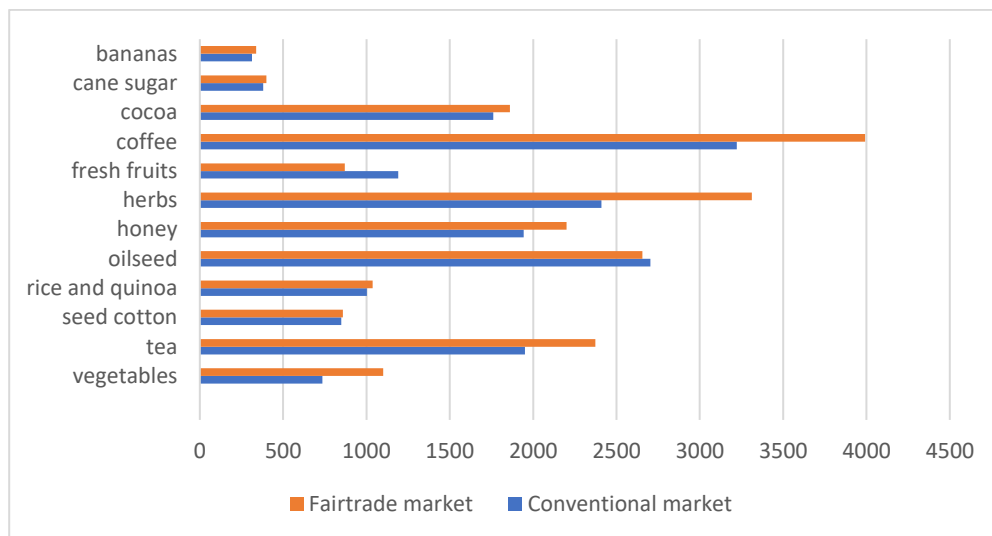


Figure 6: ratio between revenues and volume sold, by products



The ratio between revenues and the volume of products that generated them, both on the FT and conventional markets as shown in figure 6, show that the price that producers receive from FT is higher than the one they get on the conventional one, for all the products except for oilseed production. As shown in figure 7, most of the social premium goes to producers' organizations in Latin America, the macro-region with the largest number of organizations and volumes of product. Similarly, the means confirm that producers from this region receive on average a greater amount of social premium. This trend is even more evident by analyzing the premium distribution in respect to the main product of the organizations (figure 8): coffee and bananas producer organizations receive by themselves more than the sum of all the other products altogether. This is due to the very definition of social premium, which is established based on revenues deriving from the sales, and therefore strongly depend on the unit value of the product itself.

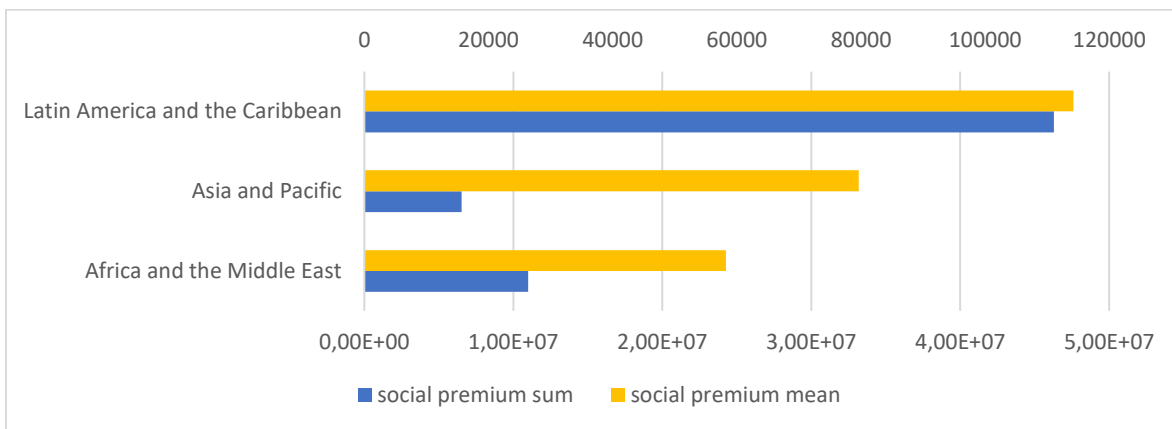


Figure 7: geographical distribution of the social premium

The use of the social premium must be decided democratically, through an assembly to which all members of the organizations can participate and vote. Although there are no strict directives on how to use the social premium, the items shown in figure 9 represent the main

categories in which the expenses are classified. Most of the premium, globally, is spent on investments aimed at improving the productive potential of the organizations themselves. This can be the case of purchasing equipment, seeds, and many different types of input. The second item of expenditure for money invested is Human Resources and administration, followed by direct payments. The other categories, in order, include interventions aimed at guaranteeing access to credit, improving education, implementing social and health programs, building infrastructures and training producers.

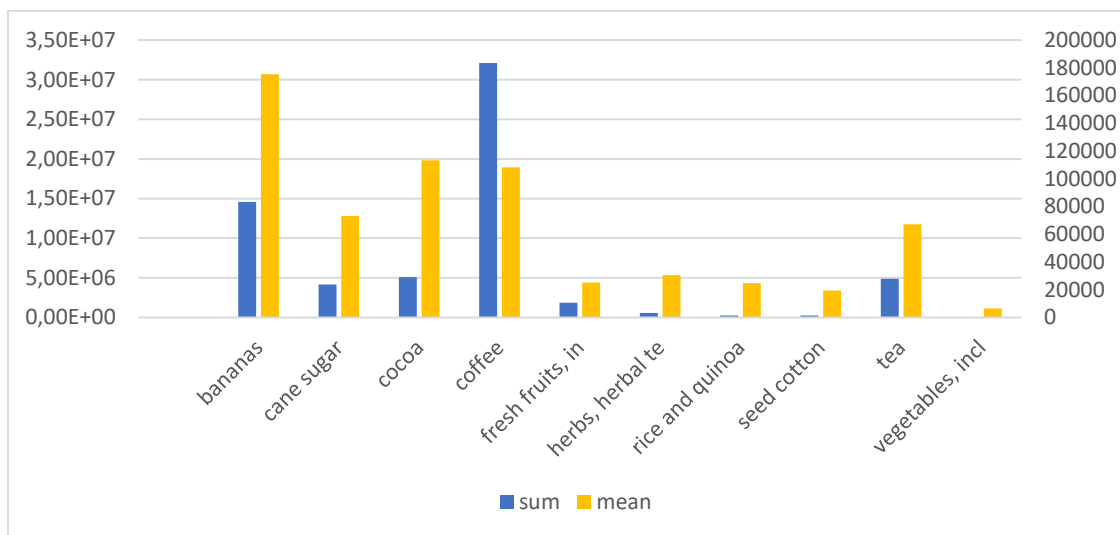


Figure 8: distribution of the social premium, by products

Figure 9 shows the expenditures of the money deriving from the social premium in the different categories of expenditure for the various macro-regions. Despite the most funded categories of spending are basically the same all over the world (investment, HR administration), there are differences in the use of premiums depending on the different macro-regions. The amount of money allocated for direct payments to the members of the organizations represents only 5% of total expenditures in Asia while they exceed 20% for the other two regions. Similarly, Latin

American organizations allocate a larger fraction of social premium to cover the administrative costs of certification, while in Africa the diversification of premium spending is more evenly distributed across the various categories.

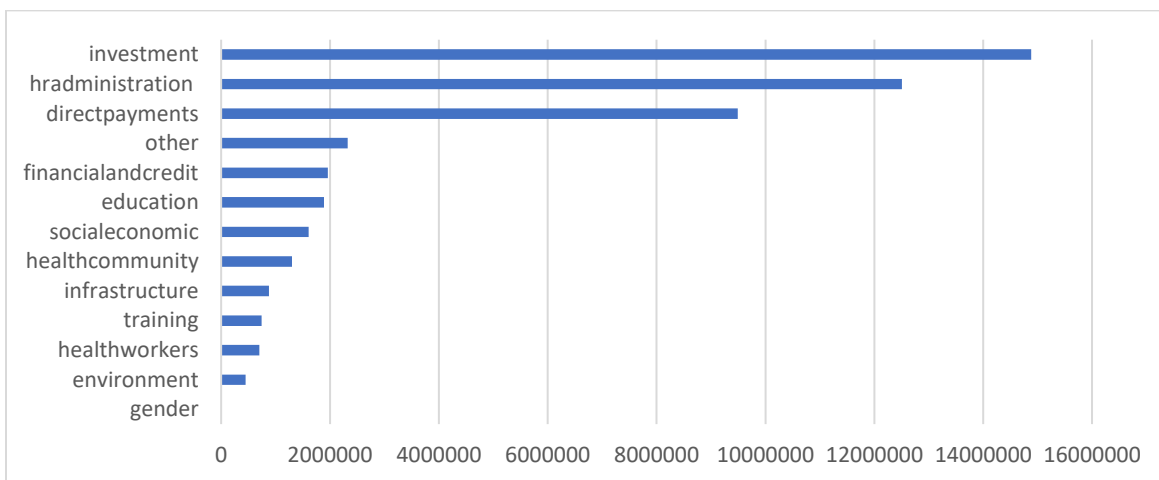


Figure 9: spending categories of the social premium

## Results

The results of the different regression models are reported in table 2 and 3. The dependent variables for the regressions are respectively the logarithm of the total revenues, the logarithm of the revenues derived only from FT and the logarithm of the social Premium (table 3). We draw on the existing literature on the impact of FT to identify explanatory variables (Bacon, 2005; Jena and Grote, 2016; Méndez et al., 2010). The independent variables in all the regressions have been kept constant and include both continuous and categorical data. The independent variables used are: the logarithm of the total volume produced, the duration of the involvement in FT, the ratio between the number of workers hand the cultivated hectares, the agricultural yield, the percentage of females among producers' organizations, the percentage of organic production and the percentage of volume of product sold on the FT market. In

addition, dummy variables have been added in relation to the type of organization (SPO / HL), macro-regions of origin and the World Bank classification of the country of origin and main product. The average marginal effects reported by *KRLS* listed in table 2 can be interpreted in a similar way to coefficients of linear regression model (Hainmueller and Hazlett, 2012). As *KRLS* does not assume that the marginal effect is constant, it allows to explore how the effect of each independent variable varies across the values of the independent variable itself. To facilitate readability and to allow a rapid examination of the effect heterogeneity, histograms of the pointwise marginal effect and a plot of the pointwise derivatives against the levels of each independent variable are reported.

Table 2: KRLS regression average partial derivatives using total revenues and FT revenues as dependent variables

	Log Total revenues	Log FT revenues
logtotvolume	0.69***	0.64***
% of females	0.37	0.45*
% of organic	0.16**	0.17**
% of FT volume	-0.56***	0.97***
workers/ha	0.037	-0.002
yield	-0.024***	-0.026***
duration of certification	0.031***	0.037***
entropy	0.21***	0.32***
product differentiation	0.083	0.020
High income countries	-0.17	-0.23
Low income countries	0.050	0.11
Lower middle income	0.075	0.040
Upper middle income	(base)	(base)
SPO Standard	-0.068	0.068
bananas	-0.38**	-0.26
cane sugar	-0.59***	-0.51***
cocoa	-0.10	-0.023
coffee	(base)	(base)
fresh fruits	-0.94***	-0.92***
herbs	-0.60**	-0.36
rice and quinoa	-0.19	-0.15
seed cotton	-0.94***	-0.84***
tea	-0.25	-0.62
vegetables	-0.52**	-0.73***
Number of obs.	802	802
Lambda	0.378	0.348
Tolerance	0.802	0.802
Sigma	22	22
Eff. Df	183.9	189.9
R2	0.861	0.841
Looloss	354.6	428.9

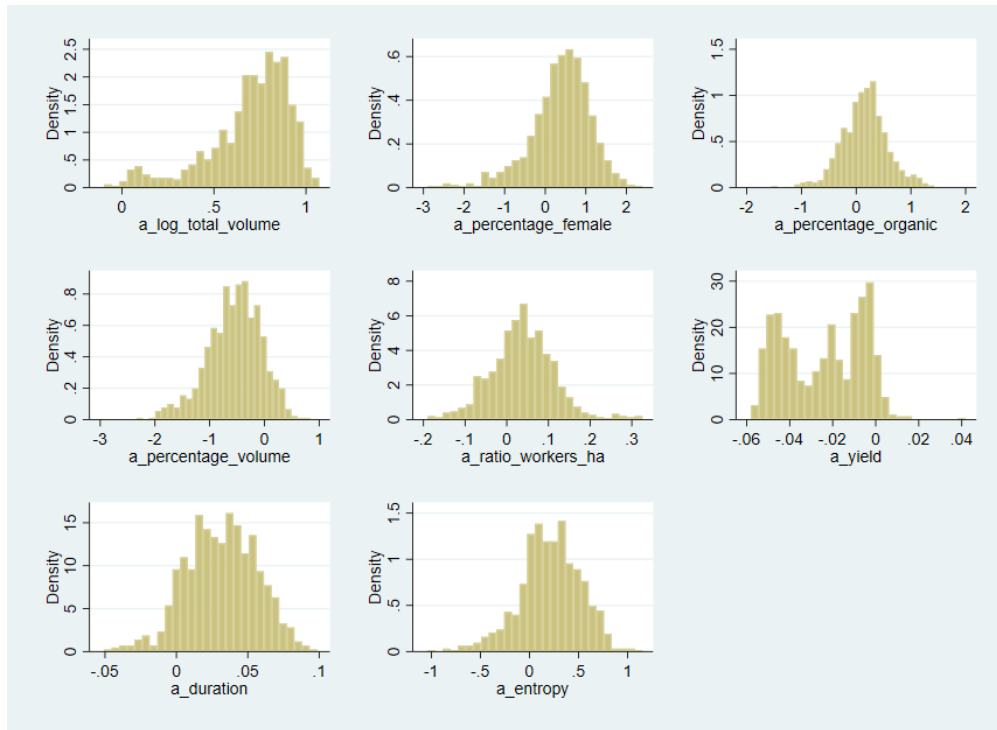


Figure 10a: Distribution of pointwise marginal effects of independent variables for total revenues regression

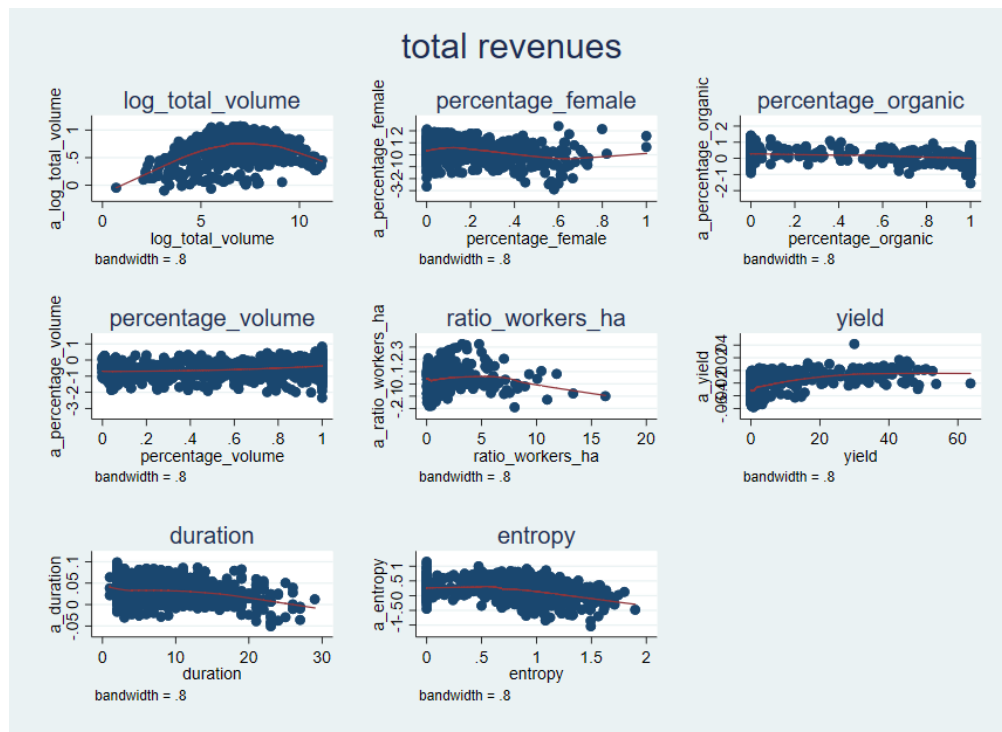


Figure 10b: pointwise partial derivatives with respect to each variable (right) in the “total revenues” regression

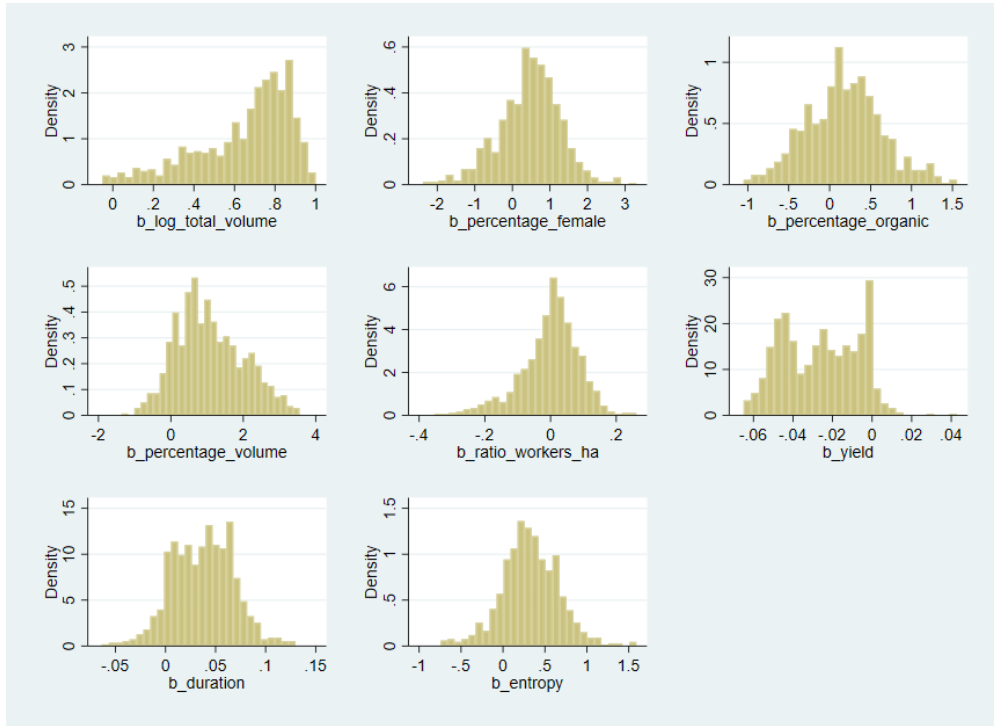


Figure 11a: Distribution of pointwise marginal effects of independent variables for FT revenues regression

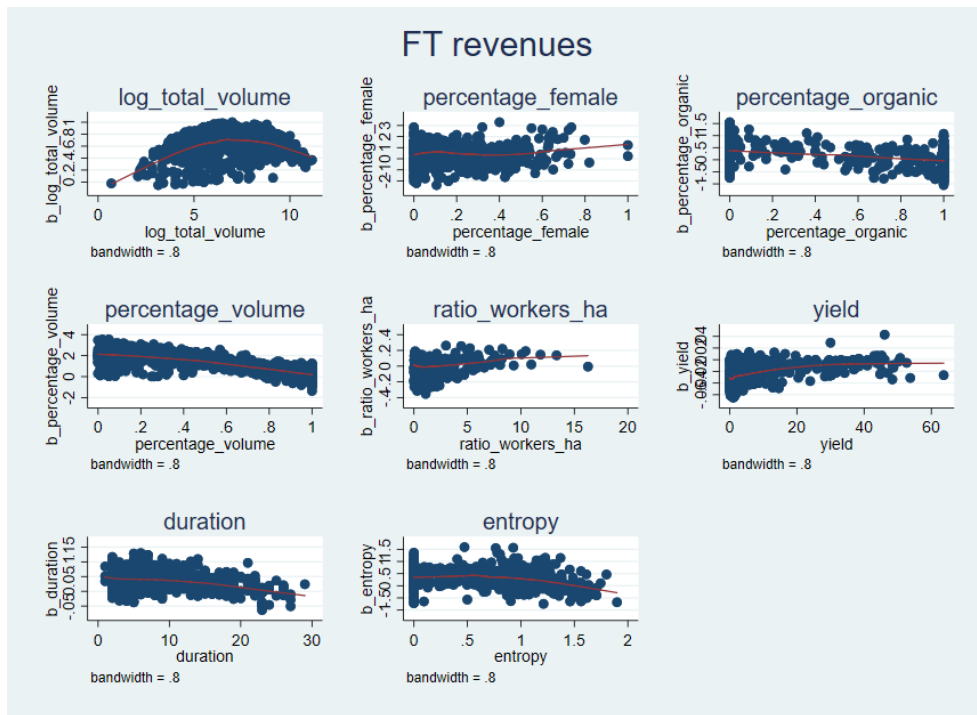


Figure 11b: pointwise partial derivatives with respect to each variable (right) in the “FT revenues” regression

## Revenues

The total amount of volume of product was included in the regressions as a control variable in all the models, as it is expected – and confirmed - that the total volume produced is strictly positively related to all the three dependent variables. For all the three models, volume production makes the strongest unique contribution, *ceteris paribus*. Following, the duration of the involvement in the FT system shows a positive correlation with both dependent variables. Beyond these two, the percentage of organic production is positively correlated with both the revenues derived from FT and with total revenues. The analysis of the pairwise derivatives in the two models reveals that the marginal effect is always positive but decreases as the percentage of organic production increases. The share of volume of the entire production that is sold through the FT market has an opposite effect on the two dependent variables: a higher percentage of volume sold through FT is associated with higher revenues from FT, but the correlation is negative when the dependent variable is the total revenue. Through the analysis of the pointwise derivatives the heterogeneity of these correlations can be better appreciated: in the case of total revenues no heterogeneity of the marginal effect in the covariate space is found, as the estimates are constantly negative. Considering FT derived revenues, it is noted that the marginal effect is positive at low levels of share of product sold through the FT system and decreases gradually as the latter increases. The percentage of women among members / workers does not have statistically significant effect on the total revenues, but a larger share of females is associated with higher revenues derived from FT.

The yield per hectare shows a statistically significant negative coefficient in both models. There are no statistically significant differences in terms of revenues in relation to the type of



organization (SPO or HL), to the World Bank classification of countries, differentiation of production or to the ratio between the number of workers and cultivated hectares. Dummy variables related to the main product of each organization show a statistically significant negative coefficient for bananas, sugar cane, cocoa, fresh fruits, rice and quinoa, seed cotton and fresh vegetables, being coffee the comparison base.

## Social premium

Table 3: KRLS regression average partial derivatives using the social premium as dependent variable

	Logpremium
logtotvolume	0.66***
% of females	0.34
% of organic	0.12*
% of FT volume	0.97***
workers/ha	-0.047
yield	-0.028***
duration of certification	0.031***
entropy	0.30***
product differentiation	-0.03
High income countries	-0.33
Low income countries	0.17
Lower middle income	0.07
Upper middle income	(base)
SPO Standard	-0.11
bananas	-0.36**
cane sugar	-0.32**
cocoa	-0.16
coffee	(base)
fresh fruits	-0.95***
herbs	-0.49*
rice and quinoa	-0.36
seed cotton	-0.48*
tea	0.15
vegetables	-0.77***
Number of obs.	802
Lambda	0.33
Tolerance	0.77
Eff. Df	188
R2	0.85
Looloss	378.1

In this second model, the distribution of social premium to producers' organizations was analyzed, identifying the characteristics of those that earn the most from it. Since the amount of Social Premium is defined on the volume of products sold under FT condition by each organization, the results of this regression are similar to those observed for the revenues deriving from FT. Again, the greatest contribution is given by the total volume of production and a lasting involvement in the FT network is associated with higher FT revenues. The share of production sold through the FT market has a positive effect on the social premium, the marginal effect of this variable decreases as the share of products sold through FT increases. High percentages of organic production are generally associated with higher amounts of social premium. The marginal effect of this variable shows positive values at low levels of organic production and decreases up to negative values at high levels of organic production. The fraction of women among the members / workers and the ratio between the number of workers and the number of hectares do not present statistically significant results. Differences in terms of social premium according to the type of organization are not significant, and there are no significant differences depending on product differentiation, nor on the different macro-regions. World Bank analytical classification of countries reveals a relationship between the social premium received and the income level of the country. Keeping all the other conditions firm, a comparison between organizations in low middle-income countries and other income categories shows that the value of the premium price is lower for high income countries. When the main product of each organization is included to the equation, being coffee the comparison base product, results show that there are some significant statistical negative differences with fresh fruits, herbs, rice and quinoa, seed cotton and vegetables.

Table 4: fractional logistic regression results

	% of revenues from FT			
Log volume produced	-0.18***	-0.24***	-0.34***	-0.85***
Duration of certification	0.033***	0.024*	0.047***	0.008*
% of females		-1.26**	-0.53	-0.48
% of organic		0.55**	0.48**	0.23
Workers/ha		-0.17***	-0.079	-0.063
Entropy		0.40***	0.46**	0.11*
Product differentiation		-0.32	-0.16	-0.012
SPO Standard	0.94***	0.66***	0.43*	0.47**
High income countries			-0.78*	-0.89*
Low income countries			-0.26	-0.56**
Lower middle income			-0.12	-0.16
Upper middle income			(base)	(base)
bananas			0.58**	1.17***
cane sugar			0.58**	1.18***
cocoa			-0.41*	-0.088
coffee			(base)	(base)
fresh fruits			-0.28	0.97***
herbs and spices			-0.25	0.39
rice and quinoa			-0.42	1.25
seed cotton			-1.03	0.46
tea			-2.02***	-1.63***
vegetables			-0.32	0.36
logpremium				0.76***
Number of obs	802	802	802	802
Pseudo R2	0.0871	0.1155	0.1659	0.2567

### Share (%) of revenues deriving from FT

Using the share of revenues deriving from FT as a dependent variable within a fractional regression model it is possible to observe the relations between some characteristics of the producer organizations in relation to their degree of participation in FT, expressed as the percentage of the revenues derived from FT compared to total revenues. Results are reported in Table 4. Analyzing these results, we must consider that the quantity of product that is sold under Fair Trade conditions is usually not at the discretion of producers due to different reasons,

including quality standards, limited market demand and cooperative quotas (Bacon, 2005; Méndez et al., 2010)

The analysis is organized as follows: in the baseline model variables with basic information about producers' organization characteristics are included as independent variables, namely the logarithm of the total volume produced, the duration of the involvement in the FT network and the type of organization. Then, the model is expanded to better identify the profile of the organizations by adding more predictors each time.

Results show that organizations most involved in the FT market are those with lower production levels. To make sure there was a negative correlation between the share of revenues derived from FT and the size of producer organizations, the same model was tested using the number of working members instead of the volume produced (two correlated variables  $\text{corr.}=0.83$   $\rho=0.01$ ) and the result remained unchanged. The duration of the certification has a positive coefficient, meaning that a prolonged participation in the certified market is generally associated with higher levels of involvement in FT, which over time becomes an increasingly important sales channel for organizations of producers. We also observe that greater involvement in FT is associated with high percentages of organic production, higher ratios of workers per hectare and a greater share of women among the members / workers.

The dummy variable related to the type of organization shows a positive and statistically significant coefficient for the SPO's standards. The product variable shows a positive correlation for cane sugar and a negative correlation with tea, being coffee the base comparison product. World Bank's country classification shows that organizations in high income countries and low-income countries have lower percentages of their product sold through the FT market.

## Discussion

In line with Arnould et al. (2009) and Ruben and Fort (2012), results confirm a positive relationship between the duration of the participation in FT and both the revenues and social premium that producers' organizations earn. This might be positive for FT as it reveals that farmers' organizations are inclined to remain linked to FT, establishing a continuous collaboration over time, since more time spent in the certified market is associated with higher revenues and higher share of volume of product sold through FT. Allegations concerning a dominance of the market by the so-called "early entrants" organizations remain, as it is shown that the longer the organizations have been involved in FT, the greater the share of products that they have been able to sell on the FT market. The low percentage of product that farmers manage to sell to FT markets has been considered a limiting factor for the full effectiveness of the system itself (Bacon, 2005; Méndez et al., 2010; Valkila and Nygren, 2010).

However, investigating the economic effects of FT, total revenues and the revenues deriving only from FT were found to be adversely affected by the share of production that is sold at FT condition. Organizations that manage to sell larger shares of their total production on the FT market report higher revenues from FT, but lower overall revenues as income from other sales channels is also considered.

The positive relationship between the share of production sold through FT and the revenues coming from FT was expected, as selling more products to FT results in higher revenues and social premium. However, if the average correlation is positive, the effect on the revenues is not constant for different levels of volume sold through FT. The pairwise derivatives analysis highlighted this heterogeneity: there is a decreasing marginal effect as the percentage

of volume sold at FT conditions increases. Moreover, at low levels of share of volume sold through FT the marginal effect is positive, decreases approaching zero as the proportion of volume sold on the FT market approaches to 1. These results seem to suggest that the participation in FT is most effective and profitable when FT does not represent the only sale channel for the organization. Results highlight the different approach that producers' organizations of different sizes have towards the FT market. Smaller organizations, mostly SPOs, sell most of their production on the FT market and therefore have a greater reliance on it to sell their products. Larger organizations tend to use FT as part of a strategy to diversify sales channels and therefore sell smaller quantities of the product compared to the total.

Amongst main findings is the fact that inclusion of females among working members and organic production are associated with greater quantities of revenues and social premium. These aspects are crucial, especially considering the specific objectives of FT, which include the promotion of sustainable agricultural production systems and to help overcome gender differences that strongly affect the lives of women in developing countries where FT works. Though Ruben and Fort (2012) and Parvathi's (2016) findings found that joining FT does not significantly increase income of organic farmers, our results show that a greater share of organic volume is associated with higher revenues and social premium. The share of females within the organizations is positively correlated with the revenues deriving from FT and the social premium, but not with the total revenues. This seems to suggest that the FT system rewards gender inclusion within its organization network. Still, it is not possible to draw general conclusions over women's involvement in Fair Trade, because of the limited evidences and the heterogeneity of experiences that compose it (Mcardle and Thomas, 2012). Indeed, our results show that among SPOs women represent on average 18% of the members, while for the HL

organizations more than a third of the workers are women. As mentioned, this figure seems to suggest a greater difficulty for women in being owners or partners of a business rather than just hired workers.

Organizations that obtain higher yields are generally associated with lower revenues and social premium. This also seems to be confirmed by the coefficient of the ratio between the number of workers and cultivated hectares indicator, which is positive although not statistically significant. Organizations with higher yields are likely to be more technologically equipped than the average, and it is likely that they are also those with greater skills and experience in the market and therefore use the FT market along with other sales channels.

There are no differences in the distribution of the revenues derived from FT in relation to the differentiation of production, the classification of countries (according to World Bank classification) or the type of organization. This latter result seems to contrast the thesis of those who argue that the opening of the certification to the plantations has distorted the original message of FT and shifted the attention from small producers to plantations (Sylla, 2014), as there is no evidence that a greater amount of revenues circulating in the FT network is intercepted by HL standard organizations. Rather, this opening seems to have expanded the pool of workers who benefit from the advantages of participating in FT.

Including product specific dummy variables in the models using coffee as a baseline for comparisons reveals that there is a strong specificity of the revenues derived from FT - and therefore of the social premium - compared to the type of product. In this scenario, the revenues that an organization can generate are not only dependent on the efficiency and productivity, but also on the market prices for the specific products. Compared to coffee, revenues obtained from FT are significantly negative for fresh fruits, herbs, rice and quinoa, seed cotton and

vegetables. It is therefore suggested that where high value-added crops are produced (coffee and tea are sold at very high prices per kilo), with a higher market price for average unit, the overall revenues and the revenues from FT are higher. In general, organizations that cultivate crops with a greater tradition and bigger sale volumes within the FT market receive greater amounts of premium price. Although trivial, these might be limitations of the social premium, that should respond adequately to the criticism according to which FT excessively influences the choices of the crops and limits migration to other crops (Ronchi, 2002).

## Conclusions

The goal for this study is to examine the main significant characteristics of producer organizations in relation to the allocation of the revenues and of the social premium in the FT network. The analysis of the comprehensive database of the MEL database provides a detailed image of the network of certified farmer organizations worldwide, highlighting the geographical distribution of organizations and their main characteristics. Production indicators and topics related to organic production, to gender inclusion and to the share of production sold on the FT market were analyzed. Furthermore, *KRLS* regression was used to study the allocation of revenues - understood as those deriving from FT only as well as the total ones - and of the social premium within the FT network. Our findings suggest that while Fair Trade is usually considered as a positive developmental tool, its impacts are not homogeneous, and several aspects must be taken into consideration.

Results highlight the different types of approach towards FT by the organizations that make up the network of suppliers: smaller organizations, and in particular SPOs, have a greater dependency on FT to sell their products, while larger organizations tend to use FT as part of a



strategy to diversify sales channels, and derive from the FT market lower shares of revenues compared to the total. Therefore, considering the revenues, the approach to the FT market is to be assessed in relation to organization's capabilities and market conditions, whether as a main, if not unique, form of sales channel, or within a strategy of diversified distribution. On the other side, results suggest that FT might be more effective by using customized forms of support and involvement of producer organizations, differentiated according to the type of organization of producers, to their production capacity and size.

The scenario that emerges from our results suggests that the distribution of the revenues and the social premium within the network of FT producer organizations rewards steadiness of involvement in the certification system, inclusion of females and organic production. Farmers' organizations are inclined to remain linked to FT, establishing a continuous collaboration over time, since more time spent in the certified market increases not only the revenues deriving from FT, but also overall revenues. Therefore, FT should work to strengthen the stability of the relationship over time with the certified organizations. There is also a convergence between the performance of the organizations and organic production, as adopting organic cultivation practices along with FT is linked to higher revenues both on the certified market and on non-certified markets.

Future analysis should analyze how the activities financed through social premium are effective in promoting production and improving the conditions of the producer communities, and to what extent participation in FT is able to extend benefits to local farmers' communities, to better appreciate the full impact of FT in the global market scenario. Indeed, the social Premium should be targeted based on analysis and optimized by targeting areas where interventions are more needed and will be most efficient.

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# **4 - An analysis of the Fairtrade cane sugar small producers' organizations network**

## **Introduction**

Sugar is one of the oldest traded commodities. From the 15<sup>th</sup> century onwards sugar has had a large influence in economies worldwide (Gudoshnikov et al. 2004; Griggs 2011), and nowadays it represents an important commodity for the economies of different countries and one of the most regulated products on international markets, being often subject to quotas, subsidies and import duties (Benešová et al. 2015). Sucrose, commonly known as sugar, is a disaccharide carbohydrate, extractable in nature from various plant sources. However, given the modest content in most vegetables, it is economically advantageous to extract it from sugar cane (which contains 10-15% of its weight) and sugar beet (containing 13-18% of its weight) (Gudoshnikov et al. 2004; FAO 2010). Thus, sugar production relies on two different crops that are produced in very distant geographical areas from each other, resulting in a strong competition and inter-relationship between the markets of the two crops.

Sugar cane cultivation plays a very important role for rural development strategies in many developing countries, where sugar cane production has been traditionally associated with cases of child labor, poor working conditions, land tenure issues and health related problems affecting farmers (Human Rights Watch 2004; Trabalho et al. 2010). Furthermore, international trade laws that govern sugar imports have made it difficult for smallholder farmers to access the more lucrative markets of Europe and North America. In such a scenario, small producers are unlikely to have any influence or power on the supply chain, and the price that smallholder farmers receive for cane can fail to cover the costs of production, leaving them in a debt trap

and with little capital to reinvest. Furthermore, the increase of the costs of key inputs as fertilizers and pesticides (with fertilizer costs 43 per cent higher in 2011 than 2010) and many farmers lacking access to affordable credit to invest in the farm (A. J. Higgins and Muchow 2003). The global sugarcane production system presents a considerable heterogeneity that impairs any kind of generalization regarding the sustainability of the crop across all producing countries (A. J. Higgins and Muchow 2003; Gudoshnikov et al. 2004). Sugar cane is grown in different areas, with very different climatic conditions and agronomic techniques, through a variety of business models ranging from small-scale single farms to multiple-unit managements, in countries with different economies and market regimes and different levels of control and support by the state.

The entire cane sugar supply chain is highly integrated and contains: (a) cane growing, (b) harvesting, (c) cane transport to the mill, (d) mill processing and refining, (e) sugar transported to the port or market, (f) storage, and (g) retailing to customers (A. J. Higgins and Muchow 2003; A. Higgins et al. 2006). At harvest, the stems are cut mechanically or by hand, then transported to sugar mills for processing. Processing involves crushing and grinding the stems to extract the cane juice, thickening it into a syrup, and then boiling it. This produces sugar crystals, which are dried before storage. The raw cane sugar is then refined, and this phase often takes place in the consumer countries and not where the sugar cane has been cultivated (Hollander 2008) .

Most sugar milling and refining plants are not found in countries where sugar cane is usually grown, in most cases the role of farmers in the sugar supply chain ends with the delivery of cane sugar to nearest local mill, where it will be processed and then sent for refinement. However, most of the added value is obtained from processes following the milling, that are

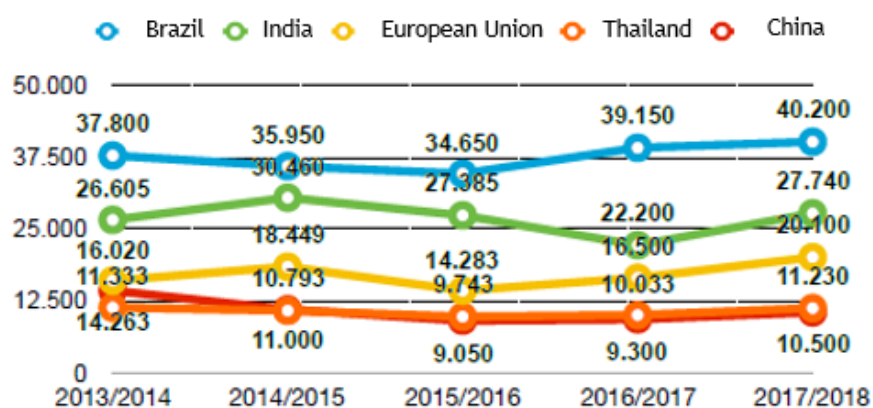
usually controlled by multinationals operating in the food sector (Gudoshnikov et al. 2004; Phillips 2014). The condition of poverty among cane sugar farmers fostered the emergence of different certification systems related to sustainability issues in the production of sugar cane, as Fairtrade (FT), Rainforest Alliance and Bonsucro. These certification systems have been long operating in developing countries where sugar cane is a key crop for small producer organizations and seeks to grant them access to international markets with more favorable conditions than they would have without the certification. To date, FT has employed almost 50.000 sugar cane farmers in the world, producing almost 200,000 tonnes of sugar cane for a total value of over 50 million euros (Fairtrade International, 2016a; 2016b). While there is information about the total value of production and the number of producers involved, we do not know much about the operation of the FT system, the heterogeneity among producer organizations in the different geographical areas and in terms of social, economic and productive aspects. This paper analyzes the network of small sugar cane producers that supply the FT certified sugar market, describing its structure and proposing a classification of the organizations able to catch the heterogeneity among producers worldwide, based on specific indicators and data on production performance. Such analysis can broaden the knowledge about the operation of the FT system with sugar cane producers, highlighting main weaknesses and barriers for the certification to be effective. The analysis uses the data collected by the Monitor, Evaluation and Learning (MEL) program, that is the body in charge of collecting data from all the organizations certified for internal use at Fairtrade International. The database includes information about all FT certified sugar cane producers around the world. The research is structured as follows: in the first section data on the world sugar market are presented, the

second part focuses specifically on the FT sugar supply chain, then the methodology is explained, and results are presented and discussed.

## Sugar: World Markets and Trade

Sugar is produced in 125 countries worldwide, with a global production that has been steadily growing since the 90's and according to the latest forecasts will exceed 180 million tons in 2018 year. The main producer countries, which have produced more than half of the world's sugar for over 40 years, are Brazil and India (USDA 2018). Despite the long European and American tradition, nowadays only 20% of global sugar is produced from beet, and sugar cane provides 80% of the sucrose consumed in the world (FAO 2010).

Figure 1: top 5 sugar producers countries (1000 t). Elaboration of USDA data (2018).

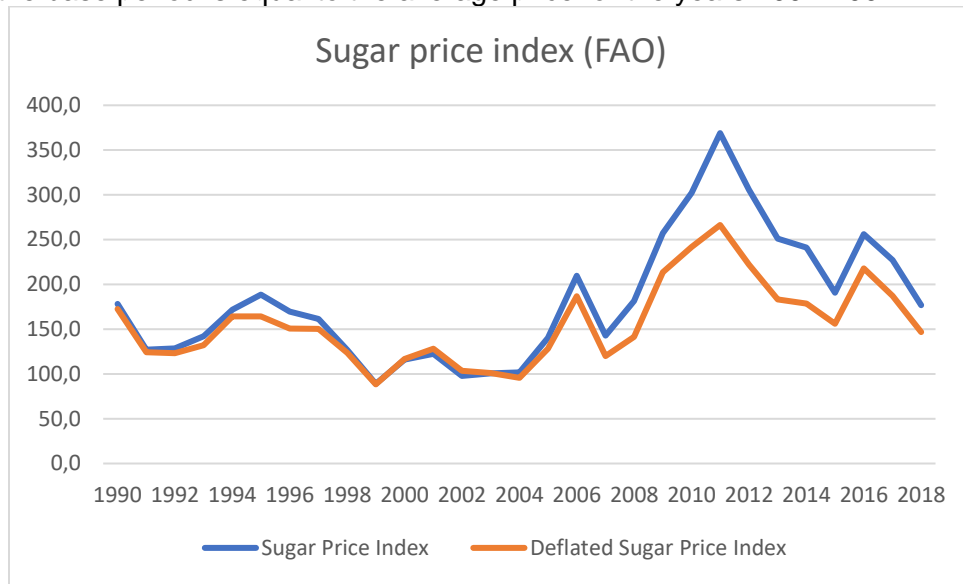


Despite fluctuations, production is still growing especially in Brazil, the largest sugar producer country (21% of global production) (USDA 2018). The use of sugar in the production of ethanol to be used as fuel played an important role in the global sugar supply-and-demand equation, as this motivated large investments in the production of sugar cane especially in the central-southern regions of Brazil (Gudoshnikov et al. 2004; OECD/FAO 2016). In this area, the costs

of sugar production are lower than in other main producing country and are still decreasing due to the national infrastructural capacities that allow the production of both sugar and ethanol from a single sugar cane cultivation (FAO 2010). Other increases in production occurred because of the optimal climate for cultivation, as in India and Thailand (respectively producing 15% and 6% of world sugar), where there have been increases of 25% and 11% compared to the 2016/2017 vintage. China, the world's fifth largest producer of sugar with 7% of world production, has increased its domestic production by 13% due to the increase of cultivated areas, both for sugar beet and sugar cane, and limitations on sugar imports (USDA 2018).

Figure 2 shows the Sugar Price index for the years from 1990 to 2018, being the base equal to the average price for the years 2002-2004. Being sugar subject to quotas, subsidies and import duties in many country, and being it used for biofuels production, its price is influenced by several factors that in many cases are external to the market itself (DEFRA 2011; Martinelli et al. 2011). Global sugar production is typically cyclical, especially for cane sugar, shifting from supply surplus to shortages (Nolte and Grethe 2012). This trend is also reflected in the price of sugar. In particular, in February 2010 the world sugar price (in nominal terms) reached its highest point in the last 29 years (DEFRA 2011; OECD/FAO 2016). This peak is mainly due to a fall in production for two years in a row that put a strain on sugar stocks (Nolte and Grethe 2012). In particular, sugar markets were heavily influenced by developments in Brazil, the world's largest sugar producer and exporter, and India, the world's largest sugar consumer and second largest producer (DEFRA 2011). After two years with a cumulative deficit of 14.2 million of tons, sugar production in 2010/11 exceeded global demand, even though remaining below the production levels of 2007/08, and prices started to decline (FAO, 2018).

Figure 2: sugar price index (FAO, 2018). Weighted average of sugar prices, the base period is equal to the average price for the years 2002-2004



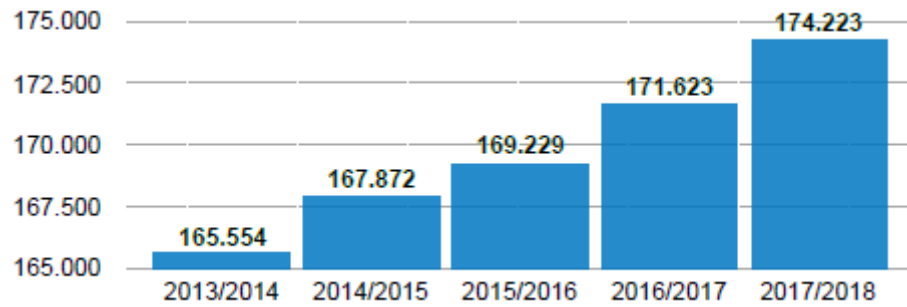
Globally, 70% of the sugar is consumed in producer countries and 30% is traded on international markets (Taylor 2017). For many developing countries, sugar is one of the most important sources of national income (Human Rights Watch 2004). For example, sugar accounts for 70 per cent of Cuba’s exportations, 40 per cent of exports from Belize, and 12 per cent of gross domestic product in Fiji (USDA 2018). In these countries, sugar cane cultivation is labor-intensive and represents an important source of rural employment (Gudoshnikov et al. 2004). It employs around 25 per cent of Fiji’s workforce, with many more indirectly dependent on it for their livelihoods. The Brazilian sugar cane industry employs over one million people, or nearly a quarter of the country’s total rural workforce (Frawley 2016). Africa accounts for only 6 per cent of world sugar production, but sugar is produced in more than 40 African countries and has great economic importance (OECD/FAO 2016). In South Africa – Africa’s largest producer – half a million people depend on sugar for a living. Sugar employs around 15 per

cent of workers in Swaziland and two-thirds of rural workers in Mauritius; in Malawi sugar is the most important export after tea (Fairtrade Foundation 2013).

Sugar exports in 2016/2017 amounted to 59 million tonnes, with Brazil accounting for almost 50% of total exports; following are Thailand, Australia, Guatemala and the European Union (USDA 2018). Imports, in the year 2016/2017, amounted to 55 million tonnes (USDA 2018). Indonesia and China lead this ranking as the two largest sugar importers with more than 4 million tons each, followed by the United States; the projections for the next few years foresee increasing imports (OECD/FAO 2016; USDA 2018). On the contrary, the European Union and India will probably tend to fall in the rankings in the coming years due to the increase in domestic production (OECD/FAO 2016; Taylor 2017; USDA 2018).

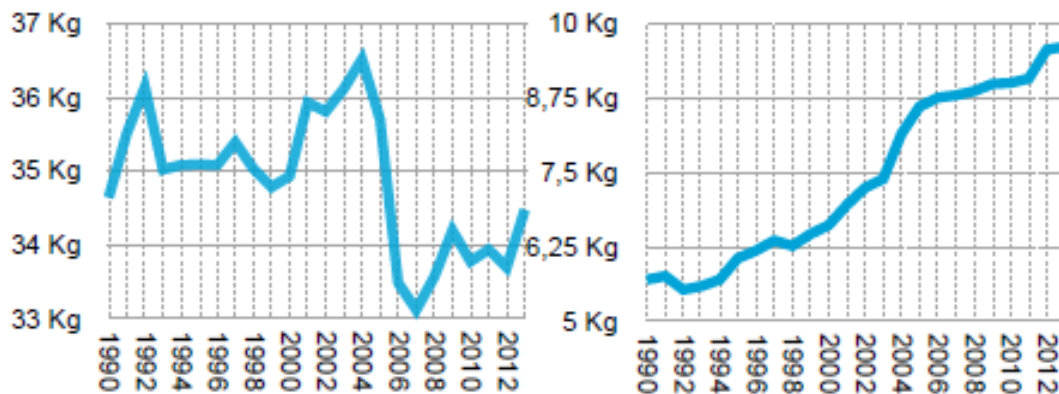
Global sugar consumption (as represented in figure 3) has grown steadily over the past 60 years, and forecasts predict global consumption of 174 million tons for the years 2017/2018, an increase of 1.5% over the previous year (USDA 2018). However, there are big differences between developing and developed countries: in the former the consumption of sugar is constantly growing, while in the latter there is a slight decrease in consumption probably due to the possibility of using different sweeteners and the concern for the growing obesity and health risks derived from the over-consumption of sugar.

Figure 3: global sugar consumption. Elaboration of USDA data (2018).



Considering the years from 1990 to 2013, consumption of sugar per capita in developing countries has been steadily growing from 5.7 kg to 9.63 kg in 23 years, increasing by 69% as represented in figure 4. Conversely, over the same period per capita consumption in Europe has decreased from 34.65 Kg to 34.48 Kg, with a total decrease of 0.5% and an inconstant trend over the period, with a maximum peak in 2004 of 36.53 Kg and a minimum of 33.12 Kg in 2007.

Figure 4: Sugar consumption per person in Europe (left) and in Developing countries (right). USDA (2018).





## Fairtrade cane sugar

Standard-compliant cane sugar production represents a niche compared to the cane sugar market, as in 2012 it accounted only for 2.7 per cent of global cane sugar production (Martinelli et al. 2011). Cane sugar industry represents a relatively small but growing market for sustainability standards. FT-branded sugar cane products are produced all over the world by small-scale organizations and sold under the Free On Board scheme (Fairtrade International 2002). In the sugar market, FT deals with a wide range of products more or less processed and suitable for direct consumption, such as ready-to-eat raw sugar, unrefined raw sugar, whole sugar, refined white sugar and sugar by-products (Fairtrade International 2002; Bower 2012; Fairtrade Labelling Organizations International 2016). FT has been working with cane sugar small producers' organizations all over the world since the late 1990s and over the years it has achieved considerable results both in terms of the number of involved farmers and sales volumes. Tate and Lyle Sugars sources 100 per cent of its retail sugars as Fairtrade certified and Cadbury Dairy Milk committed to sourcing FT sugar (Bower 2012; Fairtrade International 2016b).

Unlike many other certified products, there is no Fairtrade Minimum Price for certified cane sugar, as the selling price and payment terms are agreed between producer and buyer (Fairtrade International 2002). This decision came in 2009 following a review by interested parties that highlighted the complexity of setting a floor price for sugar, whose supply chain presents (i) great differences among producing countries in terms of economic, environmental, social and infrastructural conditions, (ii) price volatility and (iii) distortions caused by trade distorting policies, such as guaranteed minimum payments to producers, production and

marketing controls (quotas), state-regulated retail prices, tariffs, import quotas and export subsidies (Gudoshnikov et al. 2004; Nyberg 2006). Thus, it was decided that a direct negotiation between sugar producers and traders would be more effective than the imposition of a minimum price.

Conversely, the social premium is applied, which thus becomes the most important economic contribution for certified sugar producers, by adding to the contracted price a premium that since 2009 is equal to \$ 60 per tons for sugar produced by conventional methods, and \$ 80 per tons in the case of organic sugar. For secondary products and its derivatives, buyers pays at least a Fairtrade Premium of 15% in addition to the negotiated price (Fairtrade International 2002). Fairtrade International does not impose any directive on social premium expenses, but they must be decided democratically and used to help producers and their communities. Worldwide, more than 50% of the FT premium has been invested in the management and improvement of producer organizations, 25% has been used in the form of direct payment to farmers and 16% has been invested in other services to farmers such as the purchase of new work tools and the introduction of educational updates to increase the most sustainable agronomic practices (Fairtrade, 2015). FT certification allows producer organizations to request a pre-financing of up to 60% of the value of the negotiation (Fairtrade International 2002), which can be crucial for small-scale farmers' organizations to ensure they have the liquidity to provide the services agreed upon to members.

Producers are bounded by compliance with certain rules to encourage more correct negotiations, promote better management of producer organizations and reduce speculation:

- (i) small producer organizations must be owned by the same members and managed through democratic decision-making processes, in which each member has the same right to vote on

the key issues of the organization; (ii) any type of forced labor and child exploitation are forbidden; (iii) sustainable cultivation practices, healthy and proper waste management, maintenance of soil fertility and water resources are strongly promoted (Fairtrade International 2002; Fairtrade International 2016a). Producer organizations are inspected on-site on an annual basis and they are given a FT certificate that is valid for four years, unless non-compliances are identified during the inspection. Similarly, traders are audited on an annual basis either physically or through a desk audit and brand owners need to obtain a license from a National Fairtrade Organizations to use the international FT Mark on their products (Fairtrade International 2002; Fairtrade International 2016a). The FT sourcing program (FSP), launched in 2014, represents a further opportunity to boost the volumes of certified cocoa, sugar and cotton. It increases the pool of consumers by allowing companies interested to use one or more specific commodities for use throughout their business or product range to use the dedicated FSP marks, which clearly guarantee that the sugar contained in a specific product or preparation is being purchased on Fairtrade terms (Fairtrade International 2017a; Fairtrade International 2017b). Since January 2014 ten major companies have already committed to the Fairtrade Cocoa Program, including Mars, Ferrero and major German, Swiss and Japanese retailers (Fairtrade International 2017b; Reynolds 2017).

## **Methods**

To provide a complete and detailed picture of the network of sugar cane producers certified by FT, the database collected by the MEL program was analyzed. MEL is the body responsible for collecting monitoring data on all FT certified producer organizations. Data are collected on an annual basis and are used for internal learning and improvement of the system. Data used in

this study were collected in 2016 and refers to year 2015. The database was analyzed using regular descriptive statistics techniques and a combination of two multivariate statistical techniques: principal component analysis (PCA), followed by Hierarchical Cluster Analysis (HCA) on the factors identified by the PCA procedure.

PCA is a method that convert a set of observations of possibly correlated continuous variables using an orthogonal transformation into a set of values of linearly uncorrelated variables, the principal components (Jolliffe 1986). PCA identifies the factors underlying the structure of the data, allowing to construct principal components optimally summarizing information, hence highlighting the relations of interdependence between the variables in a smaller number (Jolliffe 1986; Guinot et al. 2001; Husson et al. 2010). It allows the representation and modeling of complex datasets as clouds of points (for items) and vectors (for variables) in a multidimensional Euclidean space; results are therefore interpreted based on the relative positions of the points and their distribution along the dimensions. PCA may uncover the relationship between variables and the associations between characteristics of organizations as it provides one or more continuous synthetic variables to summarize multiple continuous variables correlated each other (Jolliffe 1986). In this study, quantitative variables related to characteristics of producers' organization were used as active variables after being normalized (when needed), while quantitative variables were added as supplementary information. PCA has been performed as a pre-process for clustering to transform categorical variables into continuous ones and to characterize groups of organizations by categories with a smaller number of variables while retaining as much information as possible. To implement the PCA, 7 continuous variables were selected from the dataset, so that explained variance could be maximized. Variables included in the model were:

- The duration of the involvement in the certification system,
- The share of volume of sugar sold through the FT market compared to the total production,
- The share of organic production,
- The agricultural yield,
- The ratio between workers and cultivated hectares,
- The total number of members.

Two qualitative variables related to the to the geographical location of the organizations over three macro-regions and to product differentiation.

Hierarchical Cluster analysis (HCA) function aggregates clusters so that “the growth of within-inertia is minimum” (Husson et al. 2010), which is the same as minimizing the reduction of the between-inertia. In other words, the hierarchical clustering aims at finding data sets or variables that belong together, and at separating them from the other data, resulting in several clusters. HCA is performed on the components of principal component analysis and the hierarchy is represented by a dendrogram on the first two components (Husson et al. 2010). Hierarchical classification was undertaken using the criteria of Ward aggregation (Ward 1963; Guinot et al. 2001; Husson et al. 2010). The choice of the number of clusters is a central issue of every clustering method, and the HCA function implements the calculation of the optimum number of clusters as it constructs the hierarchy and suggests an optimal level for division, which generally corresponds to the one expected merely from looking at the tree. A hierarchical tree may be considered as a “sequence of nested partitions from the one in which each individual is a cluster to the one in which all the individuals belong in the same cluster” (Husson

et al. 2010). The vertical axis of the dendrogram represents the distance or dissimilarity between clusters, and the horizontal axis represents the objects and clusters. Each joining of two clusters is represented on the graph by the splitting of a horizontal line into two horizontal lines, where the vertical position of the split gives the distance or dissimilarity between the two clusters.

## **Results**

### **Descriptive statistics**

Table 1 shows the number of small producer organizations of cane sugar divided into the three macro-regions in which FT operates. Most organizations are in South America (sorted by number of organizations: Paraguay, Guyana, Jamaica, Cuba, Costa Rica, Belize, Brazil, Ecuador, El Salvador), followed by Africa (Mauritius, Swaziland, Malawi, Zambia) and to a lesser extent in Asia and Pacific (India, Philippines, Fiji, Thailand). According to the classification of countries on the basis of their income as established by the World Bank analytical classification, most organizations are located in countries classified as Upper-middle income countries (n = 65), followed by lower-middle income countries (n = 31) and only 3 African organizations are in Malawi and Mozambique, which are classified as low-income countries.

regions	Low income countries	Lower-middle countries	Upper-middle countries	Tot
Africa and the Middle East	3	8	26	37
Asia and Pacific	0	12	3	15
Latin America and the Carribean	0	11	33	44
Total	3	31	62	96

Table 1: distribution of producers' organizations over the macro-regions and country income classification

<b>Africa</b>	
Mauritius	5522 (26)
Swaziland	2321 (7)
Malawi	1704 (2)
Zambia	160 (1)
Mozambique	126 (1)
<b>Asia</b>	
Fiji	15676 (3)
India	5461 (8)
Philippines	603 (3)
Thailand	20 (1)
<b>South America</b>	
Costa Rica	12649 (4)
Paraguay	7793 (15)
Belize	5639 (1)
Jamaica	4598 (7)
Guyana	749 (10)
Cuba	505 (1)
El Salvador	213 (1)
Brazil	181 (1)
Ecuador	14 (1)

Table 2: global distribution of farmers and organization

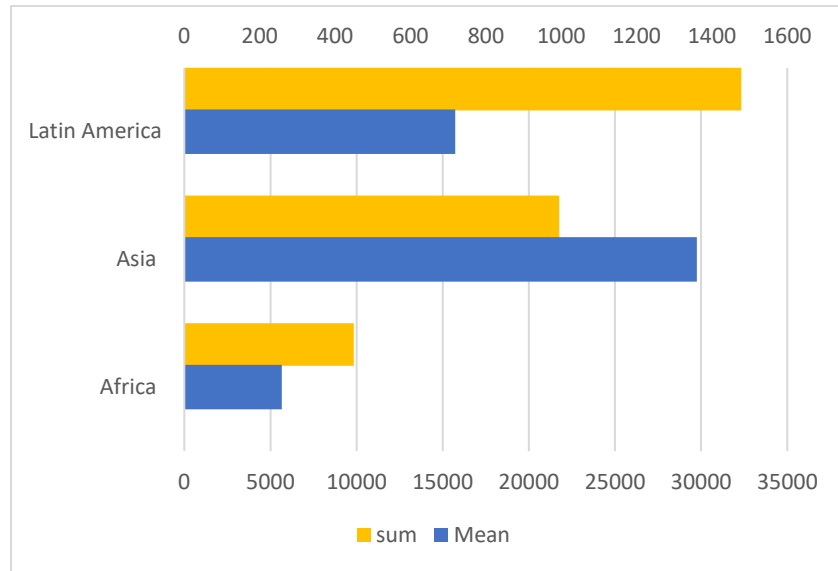


Figure 5: total number of members

Figure 5 and table 2 present the distribution of members of producer organizations in the various macro-regions and countries. Most of the FT-affiliated farmers are in Latin America, followed by Asia and Pacific and then Africa and the Middle East. Organizations in Asia are on average larger in terms of number of members (average 1360), largely due to big organizations in Fiji. The average number of members is substantially lower for African organizations (258), and in the middle between these two for Latin America organizations (718).

The majority of FT certified cane sugar comes from countries in Latin America, where 124000 tons of cane sugar certified were produced against 200000 tons of product for the non-certified market. Following there is Asia, with 79000 tons of certified sugar and 138000 tons of non-certified product, and finally Africa with volumes of 50000 and 87000 tons respectively for certified and non-certified sugar.



Figure 6: average share of organic production, female members and volume sold through FT

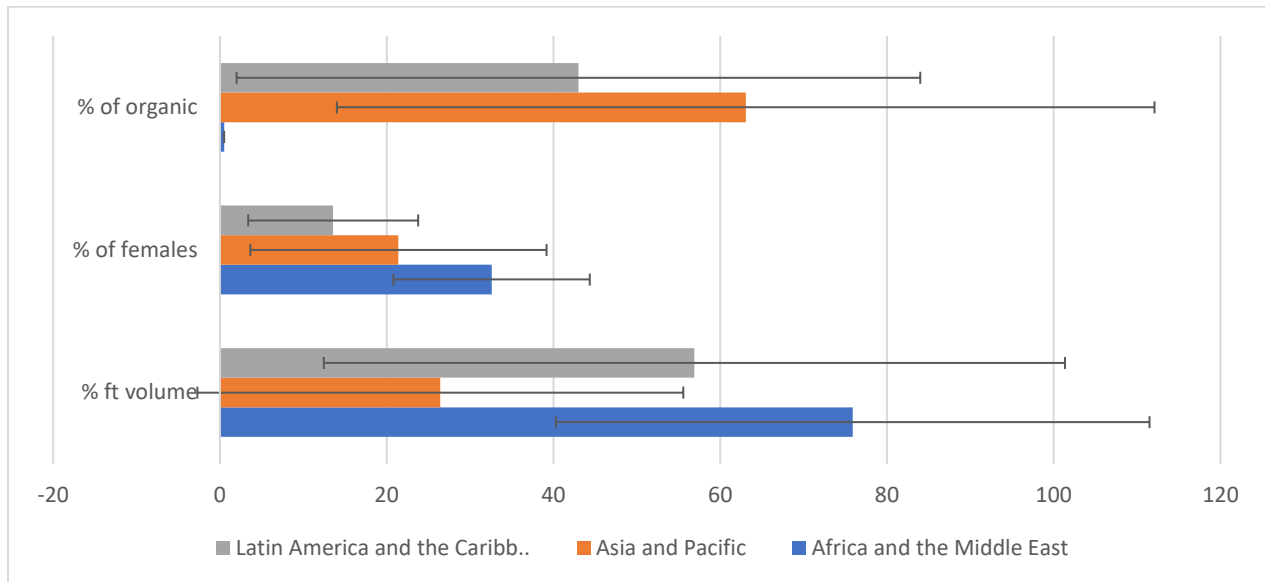
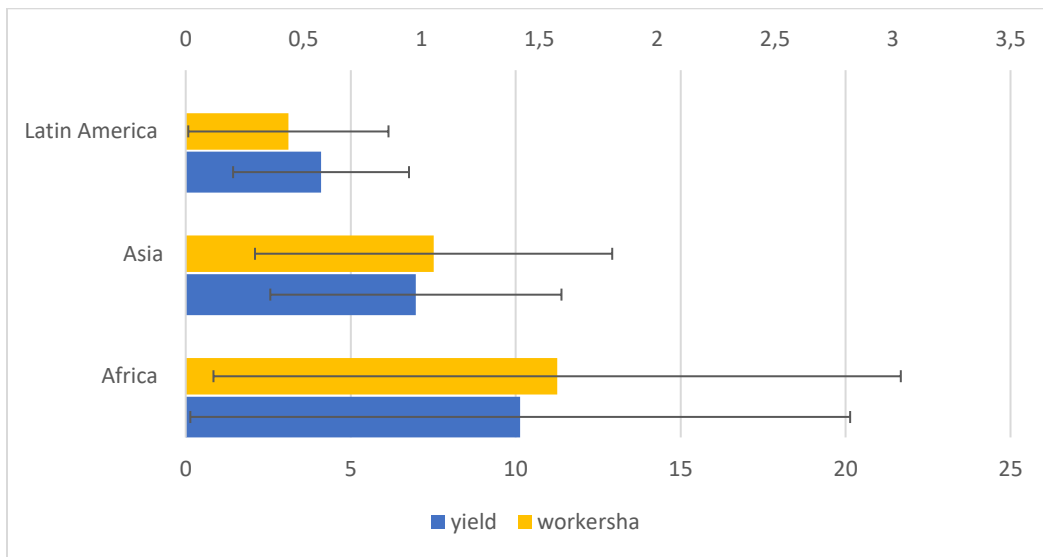


Figure 6 shows the average share of organic production, the average share of female members and the share of volume that is sold through the FT system. There are substantial differences in all the indicators: organic production share is more than 60% in Asia and just over 40% for Latin American producers, while in Africa sugar is produced only by conventional methods. In contrast, African organizations are those with the highest percentages of female presence among members (around 30%), followed by those in Asia (22%) and Latin America (less than 20%). Organizations rarely sell their entire production on the FT market, either for strategic choices or for the oversupply condition of the FT market itself (Bacon 2010). On average, African organizations sell almost 80% of their sugar cane production through FT, Latin American organizations just over 50% and Asian ones only 25%.

Agricultural yields and the ratio between the number of workers and cultivated hectares, as reported in figure 7, show significant differences between the macro-regions. The trend is

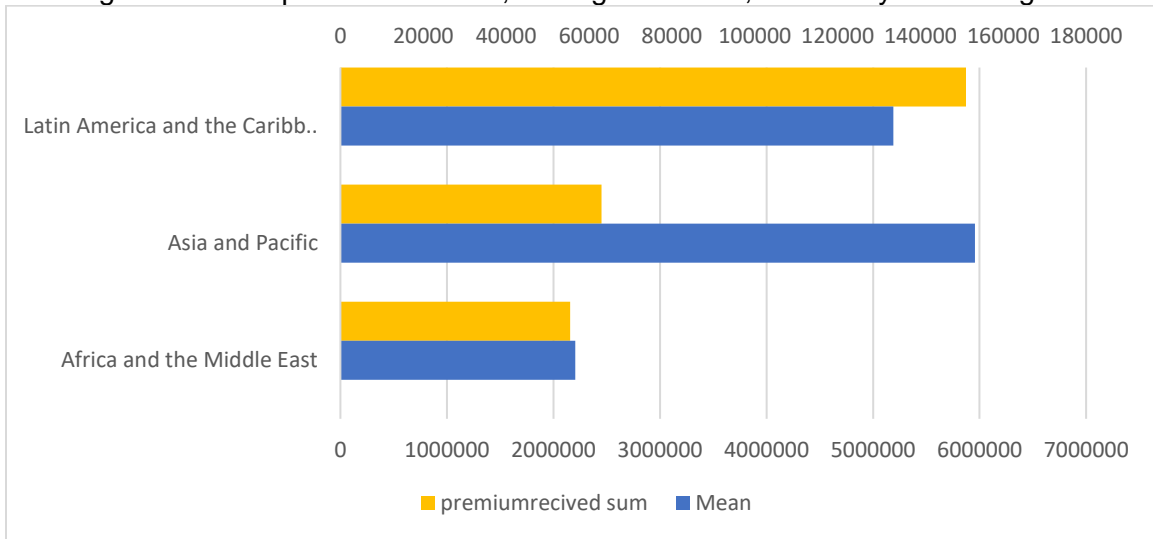
clear and well defined: organizations in Latin America on average have agricultural yields of less than 5 tons per hectare and an average number of workers per hectare of less than 0.5. In Asia these values increase to 1 worker per hectare and about 7 tons per hectare of yield, while in Africa the values increase further to more than 1.5 workers per hectare and yields higher than 10 tons per hectare.

Figure 7: average yield and ratio members/cultivated hectares



Figures 9 and 10 respectively show the allocation of the social premium in the different macro-regions and the expenditures of the social premium in different categories. The categories are those reported by Fairtrade International in the guidelines of the social premium (Fairtrade International 2002). The distribution of the social premium in the macro-regions reported in figure 8 resembles the one for the certified sugar cane volume, as the social premium amount is defined as a percentage of the volume sold through FT. Producers' organizations in Latin America, the largest supplier of certified cane sugar, intercept the largest quantity of social premiums; followed by Asia and Africa respectively.

Figure 8: social premium amount, average and sum, divided by macro-regions



The FT Social Premium is given directly to producers' organizations, and its use is decided democratically through assemblies to which all members can participate and have the right to vote (Fairtrade International 2002).

Figure 9: use of the social premium by macro-regions

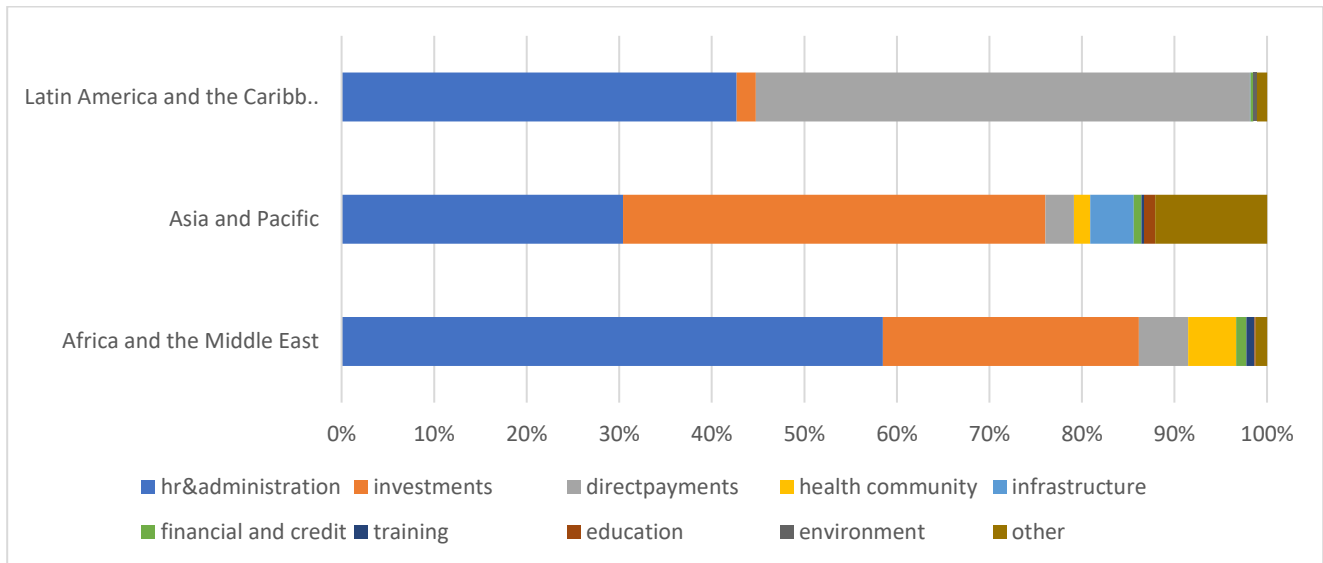


Figure 9 presents the distribution of the social premium in the different categories of expenditure. Organizations in Latin America have allocated the majority of the social premium

in direct payments to the farmers (53%) while the remaining part has been largely destined to the human resources & administration (HR&A, 43%) and the minimum remaining part in investment and other items. In Asia organizations have spent most of the premium on investments for the production (45%), followed by HR&A (30%) and other items of expenditure that form 25% of the total Social Premium. In Africa, most of the Premium was spent on HR&A (58%). 28% of the premium was used for production investments and the remaining 15% was spent between direct payments, project infrastructure, training and educational projects.

## **PCA and HCA**

PCA is used to reduce the dimensionality of a data set that includes both qualitative and quantitative correlated variables, by creating new uncorrelated variables (factors) that are linear combinations of the original data (Husson et al. 2010). As suggested by Kaiser (1960), factors with eigenvalues (the measure of variability associated with the factors) lower than 1 should be discarded, therefore only the first two factors, those accounting for most of the variability in the data set, were used for subsequent analyzes. The PCA function keeps the first two dimensions, which together explain 45.88% of the total inertia: the first factor accounts for 24.96% and 20.92% of the total variability contained in the original variables, respectively.

Table 3 presents the factor loadings for each variable of the PCA, values in bold are those that have the higher contributions to the formation of the corresponding factor, and that have influenced the most the calculation.

Variable	Factor 1	Factor 2
Age	-0.273	<b>0.690</b>
% females	<b>0.689</b>	0.331
% Organic	<b>-0.570</b>	0.104
% volume FT	0.195	<b>0.669</b>
workers/ha	<b>0.659</b>	0.352
yield	<b>0.592</b>	<b>-0.528</b>
total workers/members	-0.226	0.134
total volume produced	-0.264	-0.189
social premium	-0.306	0.055
area	-0.359	0.065
Latin America and the Caribbean	-0.698	0.025
Asia and Pacific	-0.074	-0.206
Africa and the Middle East	0.770	0.128
Product differentiation no	0.212	-0.147
Product differentiation yes	-0.212	0.147

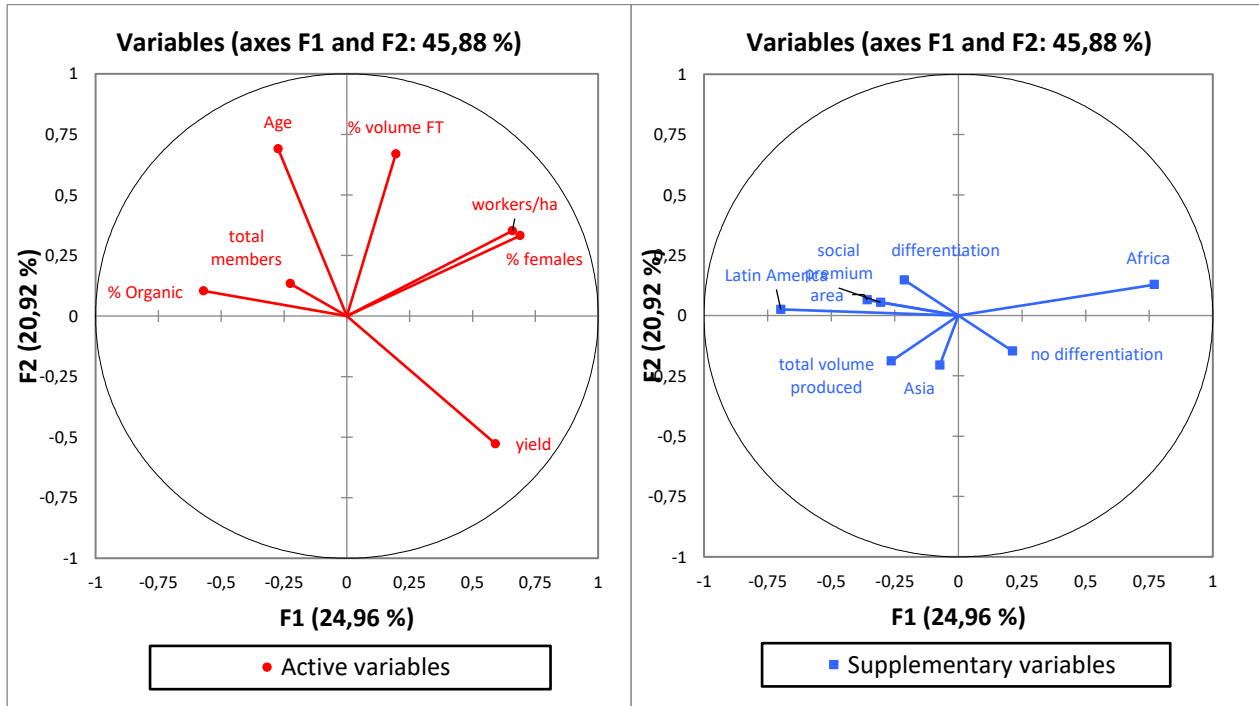
Table 3. Factor loadings of the variables to the PCA factors

The variables that most contributed to the formation of the first factor are, in order, the percentage of women among the members of the organizations, the ratio between the number of workers and hectares cultivated, the agricultural yield and the percentage of organic production (calculated on the volume of raw product). The second axis is mainly defined by the duration of the involvement in FT, the percentage of volume sold through FT and the yield.

Figures 10 and 11 show the plot of the component loadings, which corresponds to the positions of the original variables in the two-dimensional space identified by the PCA, respectively for the variables used to construct the factors of the PCA and for the additional variables. In the first figure each primary variable is represented by a vector (red line). The second figure shows the plot of supplementary variables, that were not used to derive the components, to illustrate their associations with the other variables.

Through the analysis of the distribution of the vectors on the two-dimensional plane it is possible to identify associations of specific characteristics of the organizations and to gather

information about the meaning of the axes (Guinot et al. 2001). The first factor generated in the PCA procedure shows negative loadings for the percentage of organic production and the number or members of each organization, and positive factor loadings for the percentage of females among the members, the ratio between workers and cultivated hectares and the yields.



Figures 10 and 11: projection of the initial variables in the factors space

The only variables showing positive factor loadings towards the second factor are the duration of the involvement in FT and the share of production that is sold at FT conditions, while the yield variable has negative loading on the second axis.

Among the supplementary variables that were included in the model, strong correlations were detected between two of the macro-regions and the first factor. In particular, Africa and Asia are located at opposite positions on the first factor identified by the PCA, being Africa on the positive semi-axis and Latin America on the negative one. The two components obtained

through the PCA were used for the Ward's Hierarchical Clustering analysis (HCA, using Euclidean distance and Ward criteria). A three-cluster-based solution was selected, established on statistical criteria and interpretability. The full dendrogram in figure 13 displays the progressive clustering of objects, the point at which it has been cut during the HCA analysis and the numerousness of producer organizations in each cluster. The distribution of the organizations in the three clusters is quite homogeneous, as the clusters include respectively 30, 31 and 35 organizations.

Figure 12 shows the final nodes of the dendrogram of the HCA. Figure 13 shows the projections of individuals grouped by clusters on the two-dimensional space identified by the PCA components. In Table 4, clusters are described according to the most important variables and modalities of each cluster.

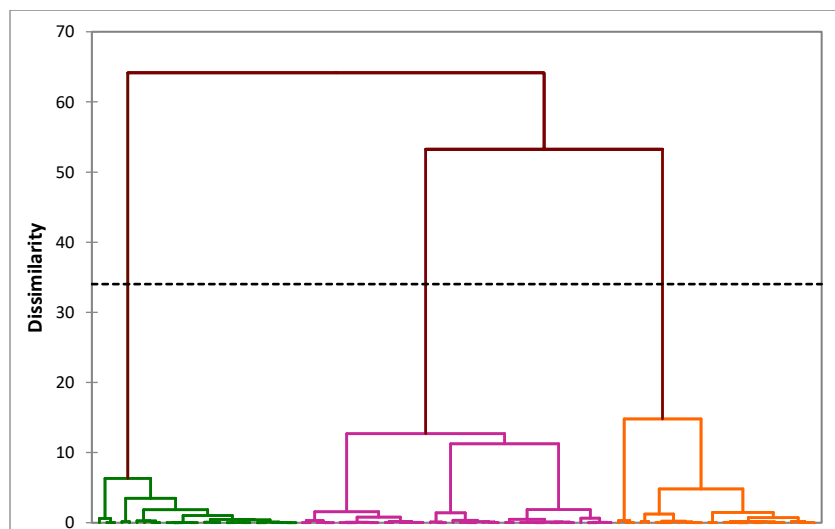


Figure 12. Hierarchical cluster analysis solution, dendrogram

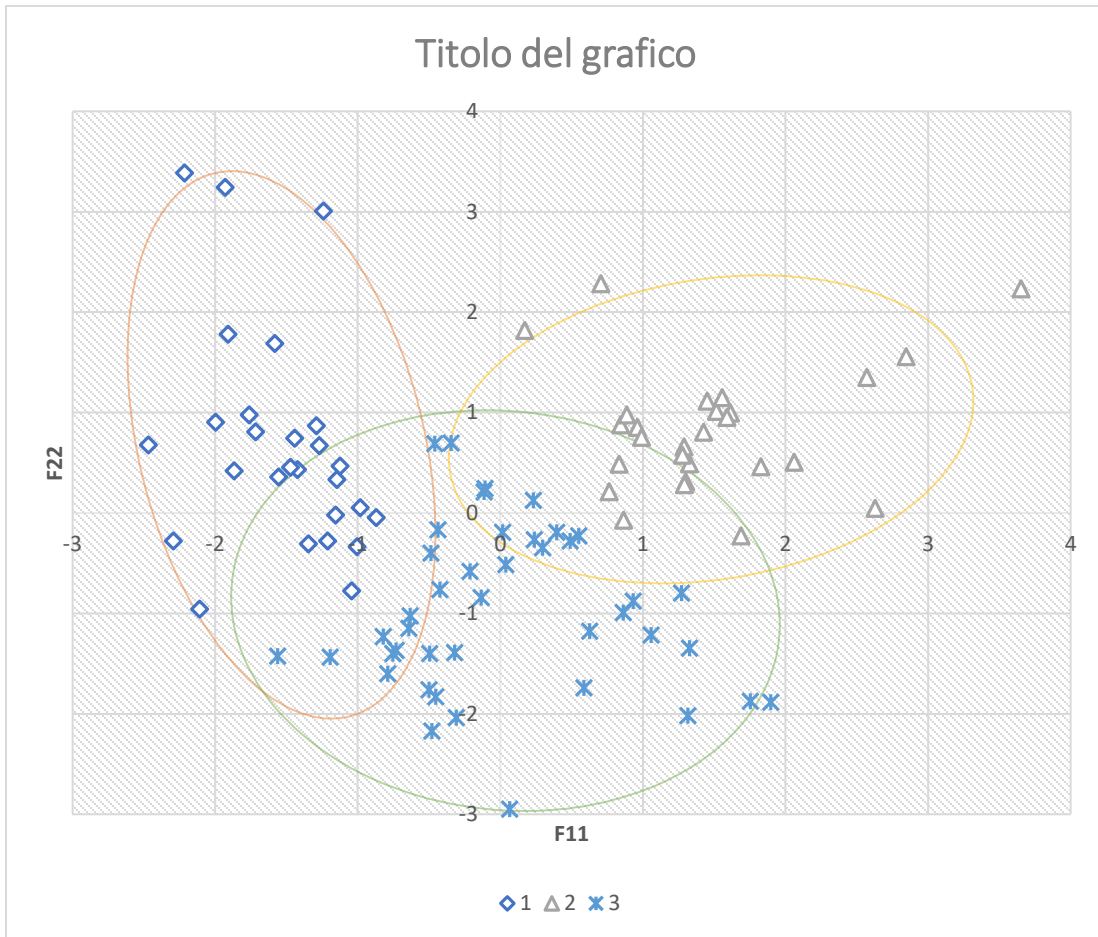


Figure 13. HCA results, individuals divided by clusters screened in the two PCA factors



Cluster	Variable	Average within cluster	Overall average	Standard deviation within cluster	Overall standard deviation	V. test	Probability	
Cluster 1 (30)	% Organic	96.33	30.54	17.95	45.83	9.46	0.00	
	Age	6.63	5.44	3.26	3.20	2.46	0.00	
	social premium	106791	9833	11933	17142	1.24	0.03	
	-----							
	workers/ha	0.71	0.92	0.89	0.95	-1.46	0.07	
	% Females	18.16	21.98	14.01	14.97	-1.68	0.05	
yield	4.78	6.23	3.08	3.55	-2.70	0.00		
Cluster 2 (31)	area	2386.39	1275.81	4615.69	2842.25	2.63	0.00	
	members	945.48	534.40	1968.96	1205.86	2.29	0.01	
	tot.volume	8747.77	5712.99	14305.70	10118.20	1.98	0.02	
	social premium	134459	9833	23706	17142	1.17	0.04	
	-----							
	%volumeFT	34.87	59.22	24.24	42.33	-2.23	0.01	
	workers/ha	0.54	0.92	0.44	0.95	-2.67	0.00	
	% Organic	0.37	30.54	1.64	45.83	-4.34	0.00	
% Females	10.91	21.98	10.39	14.97	-4.98	0.00		
Cluster 3 (35)	% Females	35.05	21.98	7.66	14.97	6.45	0.00	
	yield	8.45	6.23	2.77	3.55	4.62	0.00	
	workers/ha	1.44	0.92	1.09	0.95	3.98	0.00	
	%volumeFT	77.54	59.22	32.12	42.33	3.20	0.00	
	-----							
	members	260.03	534.40	302.88	1205.86	-1.68	0.05	
	tot.volume	3237.06	5712.99	5756.82	10118.20	-1.81	0.03	
	area	333.51	1275.81	524.56	2842.25	-2.45	0.01	
% Organic	0.00	30.54	0.00	45.83	-4.93	0.00		

Table 4. Description of the clusters according to significant quantitative variables

	Region	% of the category in the cluster	% of the modality in the sample	% of class in modality	Value-Test	Fisher Probability	Weight
<b>Cluster 1 (30)</b>	Asia	33.3333	15.625	66.6667	2.82205	0.002	15
	Latin America	66.6667	45.8333	45.4545	2.54798	0.005	44
<b>Cluster 2 (31)</b>	Latin America	70.9677	45.8333	50	3.21543	0.0006	44
<b>Cluster 3 (35)</b>	Africa	91.4286	38.5417	86.4865	8.25614	0.0006	37

Table 5. Description of the clusters according to significant geographical distribution

Table 4 presents the means and standard deviations for each of the statistically significant variables in the construction of the respective cluster, compared to values of the overall sample. Similarly, table 5 presents information about the composition of the cluster in terms of significant categorical (supplementary) variables. Geographic location plays a dominant role in the definition of clusters, as two of the three groups are attributable to specific macro-regions, Latin America and Africa.

The first cluster groups organizations that grow sugar cane using only organic practices, that have been long involved in the FT certification system and receive larger amounts of social premium. As seen in the analysis of the main components, a higher percentage of organic production is associated with a lower yield (4.78 t/ha against 6.23 t/ha). These organizations are not specifically located in one of the three microregion, as the cluster contains both organizations from Latin America (67%) and Asia (33).

Organizations in the second cluster are characterized by large cultivated area, high number of members and a greater total production in volume, including all the indicators of large organizations. Larger company size is associated with a lower female component among the members of the organization, an almost zero share of organic production, a lower ratio of workers per cultivated hectare and a lower percentage of sugar sold on the FT market. These organizations also generally intercept large amounts of social premiums and are located mainly in Latin America (70%).

The third cluster is composed of more than 90% of organizations coming from Africa, whose share of females among the members, the agricultural yields, the ratio between workers and cultivated hectares and the share of sugar sold under FT conditions are significantly higher

of the sample average. Organizations belonging to this cluster produce exclusively non-organic sugar and are smaller in size than the overall sample.

## **Discussion**

As expected, differences due to geographical distribution of sugar cane producer organizations in the various macro-regions are also highlighted in the results of the PCA and the AHC. Two macro-regions, Africa and Latin America, are arranged on opposite sides of the first component, associated with different characteristics, and the geographic location is a significant element in the construction of all the three clusters. Still, the classification goes beyond the simple geographical distribution, while recognizing its importance in defining the context in which producers' organizations operate worldwide, as there are organizations coming from different macro-regions in each cluster that are grouped together because of other similar characteristics they share. African organizations, in particular, represent a distinct group within the network of FT producers, while organizations of Latin America and Asia are mixed in the first two clusters.

The first two clusters have similar profiles and their objects are partially superimposed on the PCA components plane. The substantial difference between the organizations in the first and second cluster is not in the geographical location (mainly from Latin America and to a lesser extent from Asia), but in the type of cultivation they use, organic for the first cluster and not organic for the second, and in the different company dimensions. Not surprisingly, organizations that cultivate according to organic standards in the first cluster are associated with lower agricultural yields compared to organizations that produce using conventional cultivation practices or do not have access to organic certification. These differences depend on the different contexts in which organizations operate and confirm the official statistics on average

productivity, infrastructure, and other indicators (Parvathi and Waibel 2013; FAO 2015). This negative correlation suggests a positive shift toward more sustainable food production system, driven by the FT system, in which yield maximization is not the sole objective of producers (Parvathi and Waibel 2016). The share of organic production is negatively correlated to the percentage of females among the members, as the two vectors are placed on opposite sides of the first axis of the PCA. The share of organic production is also negatively correlated to the size of the organization, suggesting that smaller organizations have a higher share of females among their members.

Organizations in the first cluster also show a longer involvement in the FT system and greater volume shares of sugar sold through FT compared to other forms of sales available to organizations. This seems to suggest that the constancy of participation establishes a relationship of greater dependence on the part of the organization towards the certified ethical market. To a lesser extent, the results seem to suggest that a prolonged participation in FT also leads to an increase in the share of certified organic product. These are quite controversial results because if a long-time relationship between producers and FT movement can contribute to increase the social and environmental sustainability (i.e. fostering organic cultivation methods), the dependence of producers to a specific chain scheme (FT), could reduce the adaptability of the farmers to other chain models (Valkila and Nygren 2010).

Organizations in the second cluster are larger in terms of product volumes, cultivated area and number of members compared to the rest of the sample, and do not produce organic sugarcane. This result seems to suggest that larger organizations in Latin America - but also in Asia -are less likely to cultivate using organic practices than smaller organizations. This could be associated to the higher value that organic products can gain in the market and the chance

for small organic farmers to increase their income by producing high value sugar (Gudoshnikov et al. 2004; USDA 2018).

A third fundamental difference between organizations in the first and second clusters seems to lie in the type of approach towards the FT market. The organizations of the second cluster use organic farming methods and sell more than 52 % of their production on the FT market, while those of the third cluster sell on average less than 35% of their production under FT conditions. The volume share of the product that is sold under FT conditions depends on many factors often external to the will of the organizations themselves (Méndez et al. 2010; Valkila and Nygren 2010).

The construction of the third cluster is defined on the basis of geographical origin, as the vast majority of organizations come from Africa and have similar production-related indicators. These organizations do not use organic farming systems, and this is correlated with a higher number of workers per hectare and higher yields per hectare compared to other organizations that use organic production systems. Organizations belonging the third cluster have the highest percentages of women among their members (35% against 22% of the overall sample). The role of women in the African organization is undoubtedly a good result, but it highlights the differences between the various macro-regions in terms of land tenure systems and the possibility for women in different contexts to own farmland and be an active part of a producers' organization. The third cluster describes a less advanced production model typical of several Sub-Saharan African countries where the lack of infrastructures, value chain organization, and other factors severely limit the differentiation strategies (Nyberg 2006; Fava and Ribas 2012).

## Conclusions

The sugar supply chain is one of the most relevant and peculiar value chains in the global scenario for many different reasons. Sugar can be produced from different vegetable sources, among which the global market is dominated by sugar cane cultivated in tropical and subtropical countries and from beet coming from countries in the northern hemisphere (namely Europe and USA). Thus, sugar production involves two different crops converging in the same destination market, without any significant difference in consumers perception (for white refined sugar). This supply model creates a specific competition between farmers in very distant countries. Moreover, as it happens for other commodities, the price of sugar at the farm gate is conditioned by the market dynamics and the limited price at consumption.

The FT system can play a relevant role by balancing the global value distribution within the supply chain, benefitting the producers in the poorest countries by guarantying a premium price devoted to social activities and high social standards, by including women and prohibiting children work. FT is a flexible certification system and can adapt to the features of local markets and social dynamics, so, by means of PCA and HCA on MEL data, differences in the small producers' organizations in the FT network were identified and summarized. Although the geographical location plays a clear and evident role in the definition of the operative context, it is not the only determining criterion in defining the classification. In fact, the most relevant variables are related to the type of cultivation (organic or not), the size of the company and the approach and the organizations have towards FT, defined as the percentage of product that is sold on the FT market compared to the total. These results stress the need for targeted strategies in order to increase the overall sustainability of sugar production by promoting

specific measures to increase the productivity, to foster gender balance and organic production, where it is more needed. In particular, the use of the social premium can contribute to improve the weaknesses of producers' organizations (i.e. investments and training to increase productivity for organic farmers, specific programs for gender inclusion, etc.).

The methodology allows to understand the relationship between the different characteristics of producers' organizations and to draw a classification of organizations that goes beyond the simple geographical location and reflects the peculiarities of the companies on different indicators about social, environmental and productivity aspects of production. FT approach can improve the general wellbeing of local population, leverage strategic features within the value chain and balance the social inequalities, in particular in the sugar market. Future research should determine whether and how much an ethical certification can be appreciated and valued by consumers when buying a commonly used product such as sugar, and to what extent this strategy of using ethical certifications such as FT is viable by manufacturers of sugar.

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# **5 - Elicitation of WTP for Fairtrade cane sugar and analysis of ethical consumer behavior: an experimental auction approach to estimate the effects of information and titration-BDM**

## **Introduction**

Sustainability has become a central theme in the international public and political debate (Walker, 2017) and the awareness of the consequences that food production entails has increased among consumers over time (Andorfer & Liebe, 2012; Bublitz et al., 2010; Nicholls & Opal, 2005; Sebastiani et al., 2013). As consumers are more interested in environmental and social issues related to the processes by which the food they consume is produced, certifications and labelling have become important tools to support consumers in their purchasing decisions, by communicating the presence of sustainability aspects on food products (Bublitz et al., 2010; Van Loo et al., 2015). Moreover, certifications represent a way to differentiate products with respect to competition within a specific market (Thøgersen et al., 2010). It is no coincidence that in recent years we have witnessed the emergence of different types of market driven certifications that try to address issues such as prevention of counterfeit goods, environmentally conscious manufacturing processes, social justice and animal welfare. Many of these certifications deal with those product qualities that are defined as credence attributes (Dulleck et al., 2011), i.e. attributes that are not directly verifiable by the consumer neither before nor after having purchased and consumed the product. For these attributes, which include environmental, social and ethical features of products (Caswell & Padberg, 1992), the presence of an external certification body is necessary to act as guarantor of

compliance with certain standards and provide reliable information, reducing the information asymmetry between consumers and traders.

In the contemporary panorama of certifications, Fairtrade (FT) has the most ambitious objective in the context of the globalized market, that is to help producers in developing countries achieve better trading conditions (Naylor, 2014; Raynolds et al., 2007). Fairtrade products are niche products that have successfully entered the mainstream distribution channels in most of western countries (Raynolds, 2017). When a consumer buys a product bearing the FT logo, she/he has a guarantee that the product has been manufactured in compliance with the FT standards, a set of standards that regulate the entire supply chain from the production to the commercialization, and that ensure that farmers received a fair pay for the product along with other benefits guaranteed by FT (Fairtrade International, 2011).

Using labels to provide additional information to consumers about the sustainability of products does not imply that they will actually use them at the time of purchase (Caswell, 1998): despite several studies have found that consumers are willing to pay a price premium for FT certified food products (e.g., Arnot et al. 2006; Carlsson et al. 2010; Cranfield et al. 2010; Basu and Hicks 2008; De Pelsmacker et al. 2005; Galarraga and Markandya 2004; Loureiro and Lotade 2005; Trudel and Cotte 2009; Didier and Lucie 2008; Rousu and Corrigan 2008) evidences also show that sustainability labels currently do not play a major role in consumers' food choices (Carrigan & Attala, 2001; Grunert et al., 2014).

Moreover, the presence of a label on a product does not indicate that consumers will be able to understand its meaning and qualities at first impact. Even the consumer most sensitive to social aspects and attentive to logos may find it difficult to interpret sustainability labels (Annunziata et al., 2011) and to understand the information they convey (Vecchio & Annunziata,

2015). The effect and acceptance by consumers of additional information on products they buy depends on their relative transaction costs for becoming informed and how they receive the messages (Vecchio & Annunziata, 2015): using information imposes costs upon consumers and some of them attach little value to particular quality attributes and therefore may choose to ignore information about them (Barnett et al., 2010; Caswell, 1998). The spread of different certification systems can even confound the final consumer, thus producing the opposite effect, increasing consumer insecurity (Gao & Schroeder, 2009; Grunert et al., 2014).

The lack of awareness and information regarding ethical certifications on food products has often been considered a limiting factor for the purchase of FT products (Fridell, 2007; Pedregal & Ozcaglar-Toulouse, 2011; Pelsmacker et al., 2006). This seems to suggest that the ability of the labels to communicate the message embedded in the product may have been overestimated and that providing additional information might be more effective, particularly in those countries in which awareness is low (Vecchio & Annunziata, 2015). The first prerequisite for consumers to form intentions to purchase FT products is that they need to have knowledge about it (Fridell, 2007; I. Hudson & Hudson, 2003; O'Connor et al., 2017). FT certification awareness among consumers presents notable differences among countries: in the UK, Austria, Switzerland and Germany FT is well known, while in countries like Spain, France, US and Canada the knowledge about FT is lower. Past research emphasized the role that information plays in promoting the awareness and sensitivity of consumers to ethical issues, pointing out that consumers would be more willing to make ethical choices when purchasing if they were informed about positive and negative attitudes of companies (Bajde et al., 2013; Carrigan & Attala, 2001; Pelsmacker et al., 2006).

According to Fridell (2007) one of the main causes of the limited expansion of the FT consumer base, and more generally for sustainable certification markets, lies in the "lack of resources of the fair trade network" that constrains its ability to inform the public on a broader scale (Fridell, 2007 pp. 273), more than in the lack of interest from the consumer. Pedregal and Ozcaglar-Toulouse (2011) found that lack of information can explain consumers' refusal to purchase Fair Trade products. Similarly, De Pelsmaker et al. (2006) found that the lack of positive information was a preventative factor in Fair Trade purchasing. Schleenbecker and Hamm's results show that information on product packages plays an important role, and that general information is preferred over specific information. Conversely, using a within design choice experiment Devinney et al. (2010) found that providing additional information does not influence consumer choices of products with social features.

Studies that investigated the effect of additional information on consumers' willingness to pay (WTP) for ethically certified products used non incentive-compatible experiments (Basu & Hicks, 2008; Didier & Lucie, 2008) or within designs, progressively providing more information about FT and recording differences in the biddings (Hustvedt & Bernard, 2010; Lusk et al., 2001; Rousu & Corrigan, 2008). Using a within design it is difficult to disentangle the effect of additional information from the "homegrown" value because the progressive treatment rounds create an exposure bias that confounds the effects of each treatment round (Charness et al., 2012). To our knowledge, the only other paper that has used incentive compatible methodologies in a field experiment to study the WTP for FT certified products using a between design is Langhe et al (2015), who found that when their choice was based solely on the packaging inspection, consumers were not willing to pay more for certified coffee than for



regular coffee, but they increased their willingness to pay when additional information was provided (Lange et al., 2015).

In this research, two experiments were designed and carried out in a supermarket using Becker-DeGroot-Marshak experimental auction (Becker et al., 1964) to study consumer's preferences and WTP towards ethical certification on common food products under different information conditions. The study uses a between sample design, carrying out two different auctions with different information conditions, to estimate the homegrown value that consumers attribute to FT certification and the effect of additional information. Moreover, we test a variant of the BDM procedure called "titration BDM" (TBDM) (Mazar et al., 2014), which has been shown to be able to elicit more truthful WTP estimates by explicitly articulating the phases that participants might actually take when answering an open-ended pricing question (Mazar et al., 2014). Lastly, participants responded to the "ethically minded consumer behavior" (EMCB) questionnaire (Sudbury-Riley & Kohlbacher, 2016), that measure the degree to which individuals perceive themselves as ethically minded when making consumption choices and at the same time collect information about the actual behavior rather than intentions or attitudes (Sudbury-Riley & Kohlbacher, 2016).

Participants were assigned to one of the treatments and asked to simultaneously report their WTP for two different 1 kg packs of sugar that were virtually identical and differed only for the presence (or lack) of the FT label. The two packs of sugar are not sold in the store: a pack of FT certified white refined cane sugar and a pack of non-certified white refined sugar. Refined white cane sugar is a new product for the Italian market. Although 80% of the world sugar is produced from cane, the Italian collective imagination and tradition are closely linked to beet sugar. In addition, the raw material from which the sugar is extracted is almost never indicated

on white refined sugar packages, and cane sugar is commonly associated with amber or brown sugar. A refined white cane sugar, sold under this trade name, and identical from every point of view to the homologue produced by beet, is a novelty on the Italian market. Secondly, white refined sugar is traded on a large scale, it is used by most consumers and its taste is standardized and widely recognized. Furthermore, as a typical export product of developing countries, sugarcane production automatically brings up concerns about ecological and social sustainability.

The study contributes to the literature in this field in four ways: first, we estimate the WTP for a new product for the Italian market, white refined cane sugar, which allowed the comparison of these results with the average price of a package of white refined sugar made from beetle that was provided to respondents before they participate in the auction. Second, we estimate the WTP for a FT certified white refined cane sugar, which allows to isolate the value that consumers attribute to FT certification and to compare these results with the answers to the EMCB. Third, we test the effect of providing additional information about FT certification on the WTP. Lastly, we test the variant of the BDM procedure called “titration BDM” (TBDM) (Mazar et al., 2014).

## **Methods**

The existing literature on the consumption of ethically labeled products is mainly based on hypothetical methods of elicitation of the willingness to pay (Andorfer & Liebe, 2012) and the majority of the research is focused on a limited range of products. Especially when dealing with social issues, several problems in current research may occur: amongst others, studies’ rather narrow theoretical focus, attitude–behavior gap, hypothetical and social desirability bias of

conventional survey data, and a lack of generalizability of empirical findings (Carrigan & Attala, 2001; Carrington et al., 2010; Lusk & Shogren, 2007; Shaw et al., 2016; Vermeir & Verbeke, 2006). In order to differentiate between what people say from what they pay, we investigate consumers' WTP for Fair Trade (FT) certified products using a non-hypothetical incentive compatible method of value elicitation, BDM experimental auction (Lusk et al., 2001; Lusk & Shogren, 2007; Silva et al., 2007). The BDM methodology is well suited for field experimental auctions (Becker et al., 1964; Silva et al., 2007), and has been widely used by researchers in the area of consumer behavior to elicit consumers' valuation of food attributes (Carlberg & Froehlich, 2011; Lusk et al., 2001; Rousu & Corrigan, 2008).

The study was conducted over three days at the entrance of a supermarket belonging to a famous retail chain during September 2018, inside a large shopping mall in Milan. Respondents were recruited before they entered the supermarket and were informed that in exchange for their participation they would receive a voucher worth € 5 as compensation for her/his participation. Each participant was randomly assigned to one of four conditions in a 2 (elicitation method: standard BDM vs. titration-based BDM) by 2 (with information vs without information) between-participants design.

One of the main determinants of success in experimental auctions lies in the good understanding by participants of the incentive compatibility of the auction mechanism, namely the best strategy to use in the auction (Lusk & Shogren, 2007). To achieve this goal, participants were given written and oral explanations supported by some examples about the operating procedures of a BDM auction. During the explanation, participants were totally free to ask questions to dissipate any doubts about the process. Given the importance of this step, participants were informed that it is of a high importance that they fully understand the auction

mechanism. Before the actual auction, respondents participated in a training session where a random product was hypothetically auctioned to mimic the next steps and facilitate the learning process. A short questionnaire was provided to be sure that participants understood the mechanism of the auction and the auction began only after the respondent answered all three questions correctly.

In the “No information” treatment, fair trade product label was presented as a “social certification” with no additional explanation. In the “information” treatment, participants were provided of a short description of the FT certification system, saying “The Mark means that the Fairtrade ingredients in the product have been produced by small-scale farmer organizations or plantations that meet Fairtrade standards. The standards include ensuring decent working conditions for producers and the payment of the Fairtrade Minimum Price and an additional Fairtrade Premium to invest in business or community projects.”

In the regular BDM treatment, once participants inspected the products (and information according to treatments), they were asked to indicate how much they would be willing-to-pay for the two packs of white refined cane sugar. Participants were informed that it was possible to bid €0.00 if they did not want to buy one or both the product. To minimize wealth effects, participants were told that they would have been able to buy only one of the two auctioned products, that would have been randomly chosen as the “binding product”. At the end of the auction one of the two products was randomly chosen to determine the binding product. A participant won the product if his/her bid for that specific product was higher than the predetermined price contained in a sealed envelope. To provide a common reference price for the product, all respondents were informed of the average price of a package of (non-FT certified) white refined sugar made from beetle, equal to 0,90€. In a typical BDM auction, the

participant places a bid for the auctioned product and then draws a random price. If the randomly drawn price is greater than the bid, the participant does not “win” the product and pays nothing. If the randomly drawn price is below the bid, the participant “wins” the product and pays the price he/she draws. To facilitate our experiment in the retail store, following Lusk procedure (Lusk et al., 2001) we used a predetermined random price for the good being auctioned. This price and the price distribution from which this predetermined price was drawn from were unknown to participants, the price was changed about every 15 minutes by drawing the price from a range from €0,40 to €2,00 by increases of €0,10. The predetermined price was revealed as the purchase price only to subjects whose bid exceeded the price.

In the titration BDM treatment participants were asked to think about their reservation price in the following specific way (Mazar et al., 2014). First, they are asked to write a number they think is a reasonable estimate of the maximum amount they would be willing to pay for the product. Next, they are asked to consider if the amount that they had written is too high, too low, or the right maximum price they would pay. If respondents answer too low or too high, they are asked to think about a new price and continue the process until they come up with the “just right” response. This final “just right” amount is then subjected to the standard BDM procedure. This variant elicitation method is expected to increase participants’ attention to their inherent preferences and diminish the sensitivity to contextual cues (Mazar et al., 2014).

Table 1: experimental design

		BDM method	
		<i>BDM</i>	<i>TBDM</i>
FT information	<i>Absent</i>	Treatment Group #1	Treatment Group #3
	<i>Present</i>	Treatment Group #2	Treatment Group #4

The entire procedure took approximately 10/15 min for each participant to complete, including the oral and written explanation of the auction mechanism. We constructed regression models to analyze participants' bidding behavior in the experimental auction, using WTPs for the two sugar packs as dependent variable.

# Results

## Descriptive statistics

Table 2 Socio-demographic characteristics of the sample (N=190)

	Freq.	Percentage
<b>Gender</b>		
male	85	43.37
female	111	56.63
<b>Age</b>		
from 18 to 24	32	16.33
from 25 to 34	35	17.86
from 35 to 44	33	16.84
from 45 to 54	31	15.82
from 55 to 64	30	15.31
65 or older	35	17.86
<b>School</b>		
elementary	5	2.55
middle school	36	18.37
high school	107	54.59
graduate	48	24.49
<b>Income</b>		
les than 10000 €	20	10.2
10000 - 19000 €	40	20.41
20000 - 29000	65	33.16
30000 - 39000	40	20.41
40000 - 49000	16	8.16
more than 50000 €	15	7.65
<b>Job</b>		
student	28	14.29
part time	30	15.31
full time	76	38.78
retired	43	21.94
housewife	7	3.57
unemployed	12	6.12
<b>Have you ever bought FT certified products?</b>		
Yes, I usually buy FT products	5	2.6
Yes, it happened on many occasions	19	9.7
Yes, it happened on few occasions	34	17.3
No, never/Does not know	138	70.4
<b>Knowledge about FT</b>		
Did not know FT	139	70.9
Knew FT	57	29.1

In order to obtain a heterogeneous sample, the survey was conducted during the week from 10:00 a.m. to 7:00 p.m. The socio-demographic data is displayed in Table 2. In total, 196 completed surveys were collected. Most of the respondents were female (56,63%), worked full time (38.78%), their families earned between € 20000 and € 29000 per year (33.16%), and had either completed some high school (54.59%) or university (24.49%). The over-representation of female respondents is desirable since they make most of the food purchasing decisions for the household.

Results of participants' Fairtrade knowledge and purchase habits show that the majority does not recognize the FT logo (70%), only 30% of the sample claims to have purchased a FT certified product in the past and less than 3% of the sample declares to regularly purchase FT certified products. To estimate consumers' knowledge and attitude towards sustainable labels, participants were asked to indicate which of the labels represented in Figure 1 they were able to recognize. Beyond the FT logo, the biological logo, the Demeter biodynamic certification logo, the EU ecolabel logo and the PEFC logo were also included. The first three labels are applied mainly for food, while the last two are respectively a voluntary ecolabel scheme established in 1992 by the European Commission that covers a wide range of products and a certification of sustainable forest management for wooden products.

The results shown in figure 1 reveal that the most highly recognized logos deal with environmental sustainability aspects: the most recognized is the organic certification logo, followed by the European eco-label. Both certification systems have long been widespread and are present on a vast range of products also for everyday use. Following, the next most recognized label is Fair Trade, which is however recognized by a minority of the sample. The last two labels have been recognized by a small minority of respondents.



### WHICH ONE OF THE FOLLOWING LOGOS DO YOU RECOGNIZE?

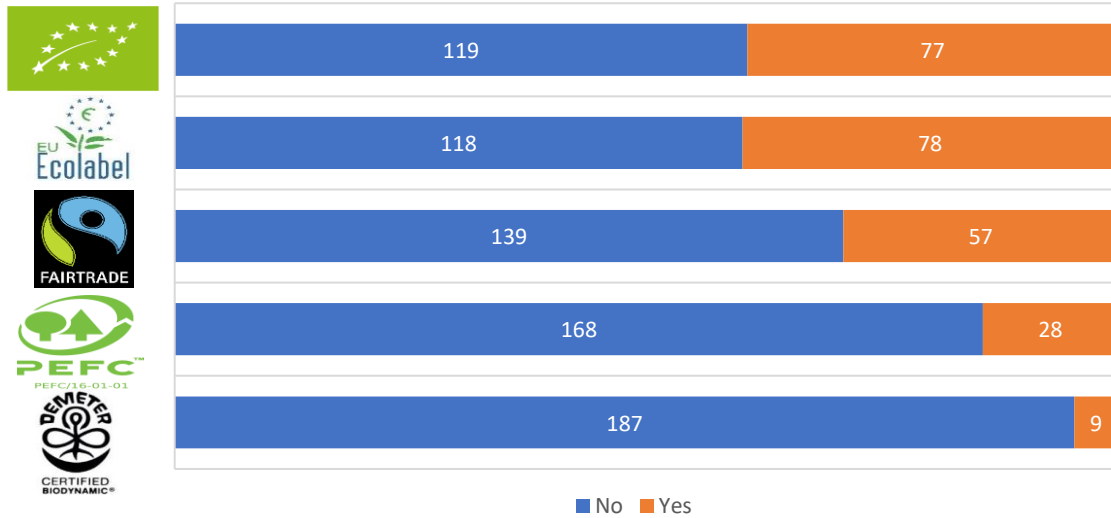


Figure 1: recognition of different types of logos by the participants in the experiment.

Results from the EMCB scale are reported in table 3 and figure 2. The questionnaire is structured in such a way as to obtain information about the principles that guide consumers' choices and their actual behaviors (rather than focusing only on intentions or attitude), proposing a series of 10 choices relevant to environmental issues and Corporate Social Responsibility. In detail, the first two questions refer to the deliberate selection of environmentally friendly products, questions 3 and 4 refer to the refusal to purchase a product based on environmental issues, questions 5 and 6 refer to specific recycling issues, questions 7 and 8 deal with the refusal to buy products based on social and ethical issues and the last two questions address the willingness to pay for sustainable products.

It is possible to find differences between the scores of the two items that make up the various groups. In the first two groups there is a difference between the answers concerning the current behavior and those that are the principles that guide the consumer in the choice of purchase.

When the question is about real behavior (items 2 and 4), and not intentions, the answers outline a less "sustainable" profile of respondents, while when the questions investigate the attitude towards sustainability aspects (items 1 and 3) the answers are shifted towards sustainable consumption. In general, respondents show a marked interest in the issues of sustainability and a propensity to change their consumption habits in relation to environmental and social aspects of companies (items 3 and 7). Furthermore, a low familiarity with the purchase of products with attributes of environmental or social sustainability (items 9 and 10) has been noted.

Comparing our results to the results of Sudbury-Riley & Kohlbacher (2016), we see that values are aligned with the UK data, higher than Hungary and lower than Germany's data. In particular, the data collected in Italy show the lowest score in answers 1 and 2, those related to the habit of buying environmentally friendly products.

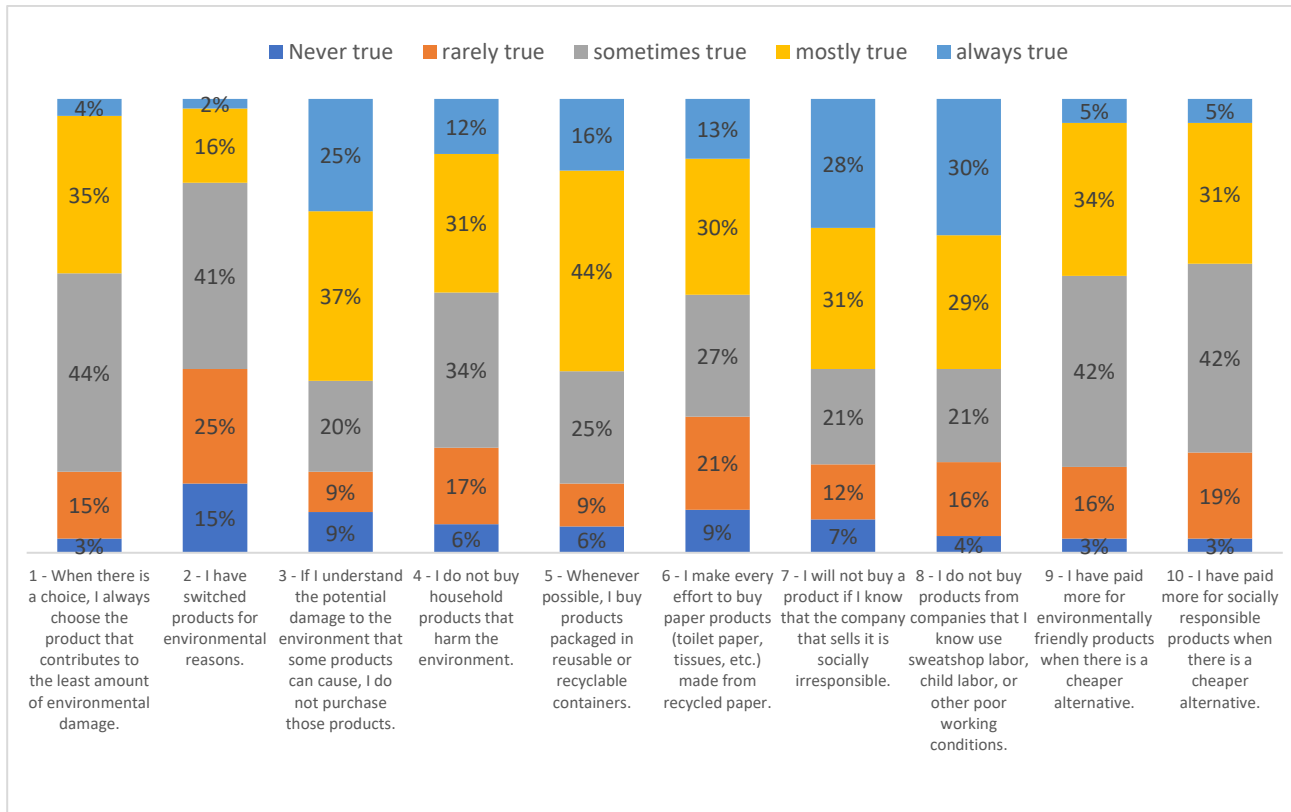


Figure 2: EMCB items and frequencies of answers on a scale from 1 (never true) to 5 (always true)

Table 3: mean EMCB item scores by country, data for other countries from Sudbury-Riley & Kohlbacher, 2016.

Item	Italy		UK		Germany		Hungary		Japan	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
1	3.16	0.85	3.17	0.92	3.58	0.95	3.47	1.09	3.51	0.72
2	2.62	0.99	2.86	1.03	3.2	1.11	3.1	1.13	3.17	0.77
3	3.6	1.11	3.47	1.06	3.96	1.15	3.52	1.11	3.9	0.93
4	3.24	1.05	3.25	1.02	3.6	1.01	3.22	1.19	3.79	0.94
5	3.46	1.12	3.48	1.07	3.85	0.95	3.38	1.04	3.61	0.89
6	3.12	1.18	3.22	1.17	3.56	1.07	3.26	1.13	3.67	1
7	3.53	1.28	3.54	1.17	3.83	1.07	3.15	1.17	3.64	0.94
8	3.57	1.24	3.59	1.23	4.28	1.01	3.34	1.29	3.75	1.05
9	3.18	0.89	3.08	1.07	3.53	1.01	2.96	1.16	3.18	0.93
10	3.13	0.91	3.07	1.07	3.42	0.96	2.89	1.15	3.04	0.93

## WTP analysis

Table 4 summarizes mean, standard deviation, minimum, maximum, quartiles distribution and mode for the two auctioned packs of sugar. Post hoc tests applying the Bonferroni methodology confirmed that the average WTPs were significantly different from each other at  $p < 0.05$ . Figure 3 shows the distribution of bids rounded to increases of 10 cents, only for the purpose of making the distribution of bids clearer graphically. As these bids are continuous and censored we decided to use the Tobit model, using WTPs for the two sugar packs as dependent variables.

Table 4: Overview of auction bids (€ per pack of 1 kg of sugar).

	mean	sd	min	max	p25	p50	p75	mode
Non certified sugar	0.84	0.232443	0	1.49	0.7	0.9	1	0.9 (n=45)
FT certified sugar	1.13	0.307556	0	2	0.8	1.1	1.2	1 (n=46)

As consumers were provided with the price of a one kilo pack of beet sugar as preliminary information to the experiment (€ 0.90), the analysis of the bids allows us to deduce some information about how this new product was welcomed by respondents in comparison to the “regular” sugar. Although the average of the bids for the non-certified product is lower than the reference price of the beet sugar, the analysis of the distribution of bids and modes shows that most of the participants evaluated the non-

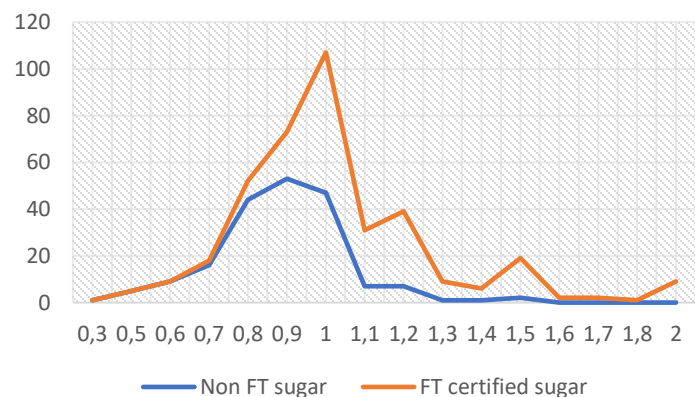


Figure 3: distribution of the bids for the two products

certified white refined cane sugar having the same price as the refined white beet sugar. In contrast, most respondents recognized the FT certified product a price premium which is reflected in a difference on the average price of € 0.23.

Table 5: Kruskal Wallis test results for treatments.

	mean	sd	chi-squared (prob.)	chi-squared with ties (prob.)
<b>Non-certified sugar</b>				
regular BDM	0.871	0.21	3.112 (0.077)	3.518 (0.073)
titration BDM	0.819	0.25		
Information	0.841	0.25	0.015 (0.901)	0.016 (0.89937)
No-information	0.849	0.20		
<b>Certified sugar</b>				
regular BDM	1.17	0.33	1.792 (0.180)	1.829 (0.1763)
titration BDM	1.10	0.27		
Information	1.18	0.31	3.113 (0.0777)	3.177 (0.0747)
No-information	1.08	0.24		

To verify the effect of the two treatments (information and titration BDM procedures), a Kruskal Wallis test was implemented on the bids for both products: the results displayed in table 5 show that information has a statistically significant effect on the value of WTP for the certified product: the mean value of the bids in the information treatment is equal to 1.18 while the treatment without information has an average of 1.08 (chi-squared = 3.113 , p 0.077). Not surprisingly, the same information treatment does not have a statistically significant effect on the uncertified product (chi-squared = 0.015, p = 0.901).

As for the titration-BDM, in the case of FT sugar auction we record a difference in the way respondents placed their bids, to the extent that the titration has an average of 1.10 bids while

the conventional presents an average of 1.17. However, this difference is not statistically significant (chi-squared = 1.792,  $p = 0.18$ ). The result is more evident in the auction on the non-certified product, where the titration estimates of the WTP are significantly lower (mean = 0.81 €) on average than those obtained through the regular BDM procedure (0.87 €; chi-squared = 3.112,  $p = 0.077$ ). We recorded the number of iterations necessary to reach the final price with the TBDM: a total of 24 respondents out of 98 changed the price for the non-certified product after the first iteration, 21 respondents modified their first bid for FT certified sugar. In 5 cases the respondents changed 2 times the indicated price, one respondent modified the price 3 times. All price changes have lowered the first declared price, except for three upward changes for the FT sugar.

The demand equation was structured as  $WTP_i = f(x_i)$ , where the subscript  $i$  represents individual respondent characteristics, WTP is the respondent's willingness to pay,  $x$  is a vector of socio-demographic, lifestyle, attitudes towards the environment, society, food consumption and use of labelling. The same demand equation was used for the WTP for the two auctioned products, parameter estimates of bid regressions are reported in table 5.

In detail, WTP was modeled as:

$WTP_i = f(\text{age, gender, education, household income, recognition of the organic label, recognition of the FT label, frequency of purchase of FT products as dummy variables, scores from the EMCB scale})$ .

Table 5: Tobit parameter estimates (N=190)

<b>Variables and coding</b>	<b>FT sugar</b>	<b>Non-FT sugar</b>
Age (1-6: lower to higher)	0.002363	0.010599
Gender (1=female)	.07787826*	0.029119
Frequency of purchase of FT products (1-4: low to high)	-.06342971*	.04116352*
Household income (1-6: lower to higher)	.02572078*	0.014892
Organiclogo (1=knows the organic logo)	.08023971**	0.017946
FTlogo (1=knows the logo)	.11165478*	0.06385
Frequency of purchase of FT products (1=yes)		
regularly	-.2196354*	-.14172818
frequently	0.012558	-0.0586
occasionally	(base)	(base)
never	.0897943*	0.014203
EMCB questions		
q1	.05116869*	.07129589***
q2	.04475727*	-0.01963
q3	0.020575	-0.02015
q4	0.00239	-0.0164
q5	.04908752**	.07818964***
q6	0.005906	0.000521
q7	.03650521*	.03187077**
q8	0.023012	.02798484*
q9	0.013349	0.016989
q10	0.009276	-0.032
var (bid)	.06320768***	.03248455***
N	196	196
Pseudo R2	0.7942	0.34

legend: \* p<.1; \*\* p<.05; \*\*\* p<.01

Most of the variables included in the model have a statistically significant effect on the willingness to pay for the certified product, results reveal that different socio-demographic factors exerted a positive and statistically significant effect on the WTP for certified products. Female respondents were willing to pay more for the certified sugar, with a premium of 7 cents, but not for the non-certified product. Similarly, a higher family income is associated with greater

willingness to pay for FT sugar, while age is not statistically significant. These correlations do not exist in the regression with the uncertified product.

The interest and the attention towards sustainability labels, here represented by the ability to recognize different sustainability certification logos, was found to have positive significant effects on the bids. This significant effect is valid for the organic logo but to an even greater extent for the FT logo, people who recognized the organic logo were willing to pay an average of € 0.08 euro more than those who did not recognize it, while those who claim to recognize the FT logo bid on average € 0.11 more for the certified product.

Interestingly, there is a negative correlation between the frequency of purchases of FT products and the bids for the certified sugar: respondents who regularly purchase certified products in the sample have a lower willingness-to-pay than occasional customers or non-buyers of FT products. Being a regular FT customer is generally associated with a willingness to pay 0.18 € lower compared to those who purchase FT products occasionally.

Not all EMCB scores have a significant effect, the EMCB questions that most concern the social aspects do not show significant effects. There is a statistically significant effect for the scores of four statements, three of which refer to environmental sustainability and only one to the social aspect. Consumers who deliberately purchase environmentally friendly products (q1), who modified their consumption habits due to environmental reasons (q2) and who attempt to direct their purchases towards choices that pay attention to the environment towards recycling and reuse (q5) are all associated with higher WTP for the FT product. Likewise, the significance of the coefficient of the score to question 7 indicates that the feeling of boycotting against socially responsible companies is associated with greater willingness to pay for ethically certified products.



## Discussion

On average, respondents declare a value for a pack of 1 kg of refined white cane sugar that is equal (or minimally higher) than the given reference price for beet sugar and recognize to the FT certified product a premium price.

In line with many results of previous research (e.g. Vecchio & Annunziata, 2015) the analysis shows that demographic variables contribute to explain the attitude of consumers towards FT certified products, as respondents with higher income and females are willing to pay more for the FT labeled sugar. The element that seems most to determine the behavior of consumers towards FT products is related to the previous knowledge that they have of the logo itself and to the attention towards the labels in general. Unlike Hudson et al. (M. Hudson et al., 2013), who found that respondents who know the FT label have a lower stated-preference for purchasing FT products, in our analysis respondents who recognized the organic label and/or the FT logo, on average, are willing to pay more for the certified product.

Another relevant aspect is the frequency of purchase of FT certified products. Against expectations, consumers who regularly purchase FT products have a WTP significantly lower than those who buy FT products occasionally, and people who have never bought a certified product have a WTP higher than occasional customers. This result seems to contrast that of Arnot et al. (2006), which found that consumers who chose to pay a premium for FT products are less sensitive to increases in the price of certified products and their own-price elasticity of FT coffee is near zero. Our result outlines a lower WTP for certified sugar by frequent FT consumers, compared to occasional consumers or even to those who have never purchased and / or do not know FT.

Estimating the effect of additional information compared to the simple label on the product packaging, the results underline the importance of information in the evaluation process of a food product. The average bids for the certified product was 1.08 € when no additional information was provided, increasing to 1.18 when respondents had access to a brief additional information about FT. These results are in line with previous research as Lange et al. (2015) and contrast those of Hudson et al. (2013) who argued that increasing the amount of information available to consumers at the point of purchase would not boost ethical consumption. One of the limitations of this study might be that in the purchase of daily products such as sugar, which occurs rarely and have a limited price, the evaluation of the product during the experiment may have been more accurate than it would actually be during a normal purchase situation.

The comparison of the bids for the non-certified product obtained through the regular BDM and the TBDM shows that the latter led to significantly lower estimates than those obtained with the regular BDM. As for the FT sugar, the average bid is lower, but the difference is not statistically significant.

This result seems to suggest that an iterative process in estimating the willingness to pay can help to reach estimates closer to the true value that respondents attribute to the product, confirming the results of Mazar et al. (2014), and extending their validity in an experiment in which WTP and preferences for ethical certified products are being investigated.

About the elements of the EMCB scale, it is possible to notice that greater attention to the environmental aspects of sustainability at the time of purchase is correlated with a greater willingness to pay for products with social ethical certification. The only question in the questionnaire referring to social aspects whose score has a statistically significant effect on the bids for FT certified sugar is the one related to the boycott of socially irresponsible companies.

However, the score of question 6, in which respondents are asked to base their answer on the basis of past experience and not on intentions, does not have a statistically significant score. Observing the average scores reported in table 3, we see that the score in question 6 is lower than the score in question 5, despite both questions refer to the same boycott sentiment. This seems to suggest that the consumer intention-behavior gap described by Carrington et al. (Carrington et al., 2010), that is, between what the consumer wants, or would like, or claims to want, and how much of these intentions then actually is translated into action, is also identified by the ECBM scale.

## **Conclusions**

As a case study, our results set an example of how Italian consumers may value and react toward white refined cane sugar and FT certified white refined cane sugar through their WTP. Using the BDM experimental auction method, we elicited consumers' WTP by creating a market with economic incentives for respondents to declare the true value that they attribute to a product or a quality while reducing the effect of desirability bias. The success of any certification systems ultimately depends on consumers' willingness to buy certified products, paying a higher price than "conventional" products, especially for everyday products (Lyon, 2006; Teyssier & Combris, 2012). In turn, the credibility and trust of consumers is closely linked to their recognition, understanding, and acceptance of these labels, and their ability to process the information correctly (O'Connor et al., 2017; Vecchio & Annunziata, 2015). Our results show that in an experimental setting like that of the BDM auction, consumers positively evaluate the presence of the FT label on the products and are willing to pay a premium for the certified products, furthermore this premium increase when consumers are subjected to brief additional

information regarding the FT system. While several studies underscore the need for information and semi commercial communications in order to increase the consumer base of FT products (Carrigan & Attala, 2001; M. Hudson et al., 2013; Pelsmacker et al., 2006; Schleenbecker & Hamm, 2015), Hudson et al. (2013) conclude that information in the form of "point-of-purchase badgering" has little impact on this, but that a long-term understanding of how FT operates and what goals it pursues can instead increase the number of consumers of certified products. Our results seem to support the first hypothesis, as a brief description of the FT system was sufficient to increase respondents' WTP. Furthermore, results suggest that an increase in prices is likely to avert those consumers who already purchase certified products on a regular base, and that there are quite ample opportunities to attract new consumers who do not know the FT certification and/or need more information about it to change their habits of purchase towards ethically certified products.

Our findings also demonstrate that although consumers may have true preferences for ethical products, they may need to be prompted to think carefully about the value they attach to it, and that an iterative process such as that of titration-BDM may serve to estimate the WTP with greater accuracy.

Finally, the affinity between ecological and social sentiment in consumers denotes the existence of increasingly careful consumers about the products they buy and the negative aspects that their purchases imply, which could open up new scenarios for different companies trying to differentiate their product by means of qualities that combine sustainability in terms of both environmental and social terms. Further research should inspect whether the results carry over to other countries and other everyday food products.

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## 6 - Conclusions

The research approach of this thesis has been to analyze the published literature on Fairtrade (FT), to be able to identify the main streams of research and their main limitations. With knowledge gathered from existing literature, the goal is to perform an analysis of the FT system – the globally most recognized ethical label – that considers the previous findings from literature and encompasses all aspects related to research on FT. Despite it is a niche in the global food market, and it is likely to remain so (Calo & Wise, 2005; Raynolds, 2002), FT still represents an interesting phenomenon in the agro-food sector, dominated by gigantic firms and difficult to approach for small and medium producers in developing countries (Renard, 1999). Furthermore, consumers are nowadays more interested in sustainability issues, but it is also a fact that people do not always make their purchases considering aspects related to the social or environmental impacts.

In the first study a systematic review of the published scientific research on Fairtrade was carried out, by conducting an in-deep bibliometric analysis of the literature published on the ISI Web of Knowledge Core Collection, which included 876 papers by 1,293 authors in 432 journals. Although there are several reviews on FT studies in literature, none of them used bibliometric methodologies to investigate how research has been structured and has evolved over time. Despite being a relatively recent field of study, FT has been approached from different disciplines with different methodologies and objectives. The structured quantitative study of the literature enabled to inspect how research has evolved over the years in the light of the changes faced by Fairtrade, to explore its scope in the broader field of the global market, to detect current research schools and perspectives within the network and to identify hitherto

unaddressed issues and unconnected subfields. This analysis highlighted the salient aspects of FT research, from the beginning to the present day, and how the challenges and evolution that FT has been facing over the years have influenced the research and perspectives of scholars. Compared to the earliest years, when buying FT products was a political statement and the FT network was meant to challenge the neoliberal economic system, FT is now working in close contact with the biggest corporations in the world and certified products can be found on the shelves of supermarkets. Likewise, research on FT has adapted over time, and has shifted the focus from macroeconomic and philosophical questions to more practical aspects, mainly linked to consumer preferences and the assessment of the impact of FT on producers.

The results of this first analysis represented the starting point on which the subsequent research phases were structured and defined. As for the state of research on FT, there are at least two elements that emerge from the literature. First, the attempt to overcome the limits of methodologies such as questionnaires, interviews and even hypothetical experiments. This is true for research that focuses on consumers, like studies on consumer's preferences and WTP for ethically certified products, and also for studies that try to assess the impact of FT certification on producers in developing countries. In the first case, social desirability bias represents an obstacle to the investigation of consumer's preferences and WTP when social or environmental aspects and deplorable behavior are involved, as respondents are inclined to give a representation of themselves that often differs from the real one. In the case of research on the impact of FT, the lack of knowledge among producers about the dynamics and functioning of the certification system (including many of the benefits) limits the possibility of obtaining trustworthy information about the impact in the communities of certified producers. The second key element that emerges from the analysis of the literature is that there are many

conflicting and sometimes confusing results concerning the impact of FT on producer's organizations, which make it difficult to compare or draw any general conclusions based on the actual evidence base. Studies that assessed the impact of FT on producers have been traditionally undermined by methodological weaknesses, selection biases and constraints, furthermore case studies have been limited to coffee and a very few other certified products, so the knowledge on the side of producers is limited in many directions.

To investigate the impact of Fairtrade on producers, based on the considerations mentioned above, the comprehensive dataset on certified producers all over the world, collected by the Monitor, Evaluation and Learning (MEL) program of FT, was analyzed. The completeness of the database made it possible to overcome the sectoral view, based on case studies, in which the previous literature was forced due to the lack of data.

The analysis focuses on the two main economic tools used by FT to support certified producers: the revenues, as the active gain for certified organizations that is derived from their participation in FT, and the social premium, the amount of money received on top of the selling price by certified products to be spent in organization and community projects. This last aspect has been often overlooked in research due to difficulties in retrieving considerable amount of data, and this thesis represents a first attempt to fill this gap in research. Both revenues deriving from FT as well as overall revenues were analyzed.

Studying the key characteristics of successful producer organizations in terms of revenues and of social premium, with respect to the stated goals of FT and to the previous findings from literature, can provide interesting information about the effectiveness of the FT system and more generally of bottom-up development strategies, as well as directing the system itself to improvement.

Results show that organizations with a long-term involvement with the FT system receive higher amounts of revenues and social premium. This might be positive for FT as it reveals that farmers' organizations are inclined to remain linked to FT, establishing a continuous collaboration over time, since more time spent in the certified market is associated with higher revenues. However, the doubts concerning a dominance of the market by the so-called "early entrants" organizations remain, as it is shown that the longer the organizations have been involved in FT, the greater the share of products that they have been able to sell on the FT market, resulting in greater quantities of revenues and social premium.

However, it was also found that the participation in FT is most effective and profitable when FT does not represent the only sale channel for the organization. Investigating the economic effects of Fairtrade, total revenues and the revenues deriving only from FT were found to be adversely affected by the share of production that is sold at FT condition. Organizations that manage to sell larger shares of their total production on the FT market report higher revenues from FT, but lower revenues when income from other sales channels is also considered. The results relating to the allocation of Social Premium go in the opposite direction, rewarding those organizations that sell most of their production on the FT market. One could argue that the social premium system perpetrates the greater control on the market by the organizations involved for a longer time in the FT system.

The choice of the share of production that will be sold under FT conditions does not depend only on the will of the producer, but also on numerous external factors, including the large supply of products from developing countries that cannot be satisfied by the demand in the developed countries.

Using semi-parametric regression, it was possible to highlight the different approach that producers' organizations of different sizes have towards the FT market. Smaller organizations, mostly SPOs, sell most of their production on the FT market and therefore have a greater reliance on it to sell their products. Larger organizations tend to use FT as part of a strategy to diversify sales channels and therefore sell smaller quantities of the product compared to the total.

Amongst main findings is the fact that inclusion of females among working members and organic production are associated with greater quantities of revenues and social premium. This aspect is crucial, especially considering the objectives that Fairtrade itself proposes, which include the promotion of sustainable agricultural production systems and to help overcome gender differences that strongly affect the lives of women in developing countries where FT works. However, results reveal that when SPOs are considered, the share of women represent on average the 18% of the members, while considering HL organizations more than a third of the workers are women. This figure underlines the greater struggle for women in developing countries to be owners or partners of a business rather than just hired as workers.

Considering the revenues, the approach to the FT market is to be assessed in relation to organization's capabilities and market conditions, whether as a main, if not unique, form of sales channel, or within a strategy of diversified distribution. On the other side, results suggest that FT could benefit from customized forms of support and involvement of producer organizations, differentiated according to the type of organization of producers, to their production capacity and size.

The overall effect of Fairtrade is still to be investigated, but the identified trends can be used to evaluate the program and provide suggestions for improving the model.

As mentioned, most of the previous research has been focused on coffee supply chain and other few products. Although FT has been operating in the cane sugar sector for decades and has achieved remarkable results, no research addressing the FT certified sugar cane supply chain were found. Chapter 4 is dedicated to analyzing the global sugar cane supply chain and trade, with a particular focus on the network of FT cane sugar producers. Evaluating the structure of cane sugar market and identifying market failures reveals several important implications for the market mechanisms and the motivations behind Fairtrade. The sugar market is found to be dominated by buyers and retailers, resulting in unevenly distributed market power for the most marginalized producers. Furthermore, sugar prices are greatly volatile, which has led many small-scaled and vulnerable farmers to fail in the past. The production of sugar cane is greatly inelastic, since farmers are unable to adjust production according to demand, which explains most of the price volatility. Facing these issues in the sugar market, FT is seeking to guarantee better conditions for marginalized producers by targeting certain market failures. The network of organizations of small sugar cane producers that supply the FT certified sugar market is analyzed, describing the structure and proposing a classification of organizations based on their characteristics, performances and location.

The fifth chapter presents the results of a Becker-DeGroot-Marshak experimental auction (Becker et al., 1964) designed to study consumer's preferences and WTP towards ethically certified products. A between sample design, carrying out two auctions under different information conditions, was used to estimate the homegrown value that consumers attribute to FT certification and the effect of additional information on their WTP. Moreover, a variant of the BDM procedure called "titration BDM" (Mazar et al., 2014) was tested, since it has been proved to elicit more truthful WTP estimates by explicitly articulating the phases that participants might

actually take when answering an open-ended pricing question (Mazar et al., 2014). Research on consumer preferences for different qualities and attributes is always very attentive to methodological aspects and is still refining their methodologies. Lastly, participants completed the “ethically minded consumer behavior” (EMCB) questionnaire (Sudbury-Riley & Kohlbacher, 2016), which measures the degree to which individuals perceive themselves as ethically minded when making consumption choices by collecting information about the actual behavior rather than intentions or attitudes (Sudbury-Riley & Kohlbacher, 2016).

As a case study, results show that in an experimental setting like the BDM auction, Italian consumers positively evaluate the presence of the FT label on the products and are willing to pay a premium for the certified products. Indeed, the WTP for non-certified white refined cane sugar is roughly equal to the average price of a common beet sugar, but the same product carrying the FT logo increased consumers’ WTP in all the treatments. Furthermore, the premium increases when consumers are subjected to brief additional information regarding the FT system. In line with results from several studies, our findings underscore the need for information and semi commercial communications in order to increase the consumer base of FT products (Carrigan & Attala, 2001; Hudson et al., 2013; Pelsmacker et al., 2006; Schleenbecker & Hamm, 2015), as a brief description of the FT system was sufficient to increase respondents’ WTP. Furthermore, results suggest that an increase in prices is likely to avert those consumers who already purchase certified products on a regular base, and that there are many opportunities to attract new consumers who do not know the FT certification and/or need more information about it to change their habits of purchase towards ethically certified products. Our findings also demonstrate that although consumers may have true preferences for ethical products, they may need to be prompted to think carefully about the



value they attach to it, and that an iterative process such as that of titration-BDM may serve to estimate the WTP with greater accuracy during the BDM procedure. Finally, the affinity between ecological and social sentiment in consumers denotes the existence of increasingly careful consumers about the products they buy and the negative aspects that their purchases imply, which could open up new scenarios for different companies trying to differentiate their product by means of qualities that combine sustainability in terms of both environmental and social terms. Even though Fairtrade is a highly debated topic, many areas of research still remain unsolved. This thesis has presented Fairtrade in a broad view through an economic perspective, and more thorough investigation into many aspects of the study is still needed.

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