Relevance of potential supply structures in frameworks involving consumer's private information: the case of fair trade

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RELEVANCE OF POTENTIAL SUPPLY STRUCTURES IN FRAMEWORKS INVOLVING CONSUMER'S PRIVATE INFORMATION : THE CASE OF FAIR TRADE

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Abstract

Fair trade actors have to deal with a significant degree of information asymmetry as regard their willingness-to-buy such goods and their willingness-to-pay for them. Many debates and controversies have paved the way for the development of fair trade, in particular concerning the distribution channel that had to be preferred. We use a common agency game framework to analyze the changes in the price level according various schemes of upstream-downstream organization and relationships. Both the private information parameter and the nature of the relationship between suppliers are the key variables that determine the price paid by consumers. If the choice of a dedicated structure does not appear relevant when costs or the number of competing producers are high, the framework of a sequential contracting process always results sub-optimal. What really matters is the nature of the firms involved and the convergence of interests. An equilibrium close to the socially optimal issue may emerge.

1 Introduction

Fair trade seeks to guarantee "better prices, better resources and stable trading conditions" (Zerbini *et al.*, 2019) and to reach "greater equity in international trade" (Poret and Chambolle, 2007).

The first necessary step to meet these goals deals with the setting of a price high enough to cover the cost of sustainable production in a safe and fair environment and to improve living conditions (De Pelsmacker *et al.*, 2006)[1]. Besides, fair trade often involves a development premium, dedicated to funding educational, health, or social programmes (Herrel *et al.*, 2017). Last, the long term nature of contracts guarantees the stability of trading relationships.

Beyond these features, producers are increasingly encouraged to make their production processes more responsible, i.e. aligned with sustainable development requirements. This is confirmed by the observation that consumers are attracted by products benefiting both from a fair trade label and an organic one[2].

Despite many studies showing how fair trade can lead to improved living conditions[3], the costs fair trade producers have to bear can sometimes become too heavy in the short run[4]. The organisation of the relationships between producers and retailers constitutes a key element to ensuring producers an improvement of their welfare. The work performed by Ruben and Fort (2011) is quite enlightening in this respect. Though enhancing the favorable impact of fair trade upon the living conditions of affiliated coffee farmers through a better access to funding and training, Ruben and Fort (2011) nevertheless find a weak income and product benefit (higher yields seem offset by the greater investment in labor required) but show that sustainable cooperatives can be seen as a key success factor. This result is consistent with Bosbach and Maietta (2019).

As it is the case in Chambolle and Poret (2008), generally farmers upstream sell their raw products to manufacturers who deliver the final good to downstream retailers.

As a by-product, the way of delivering such goods and the nature of the relationships between producers and retailers represent important issues. Some years ago, consumers' lack of knowledge, the difficulty to find or deepen market opportunities, favoured the insertion into the large scale distribution network. The traditional channel has fostered the provision of information, expanding common knowledge about fair trade and, consequently, sales. In France, in 2018, international networks represented two-thirds of sales, half of them were realized by conventional retail chains (CREDOC, 2018). However, contrary to the integrated industry,

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[1] namely a fair remuneration, safe and healthy working conditions, the absence of discrimination. . .

[2] In France, in 2018, 84% of equitable international products were also labeled organic, which was the case for 47% of French fair trade goods (CREDOC, 2018).

[3] See for instance Barham and Weber, 2012, Balineau, 2013, Smith, 2009, Arnould et al., 2011, Chiputwa et al., 2013, Chambolle and Poret, 2008.

[4] These costs are for instance costs of certification (Jaffee, 2007), costs related to labour requirements or downward pressure upon yields resulting from the introduction of restrictive environmental labels (Blackman and Rivera, 2010, Benchelt and Zeller, 2011). Yet, this effect generally can be explained by specific elements (such as the difficulty to substitute organic treatments to chemical inputs, as suggested by Becchetti 2012, Thavat, 2011). and a clear distinction must be made between short term costs and long run potential gains (when means are required to preserve natural resources, more sustainable revenue will be derived later).

its core principles are quite different from those of fair trade and may even jeopardize them through potential downward pressures upon prices, lack of commitment, the creation of private and softer labels (Poret and Chambolle, 2007). As a result, a highly debated topic is the place where fair-trade products have to be sold to keep consistent with the system core principles. We can wonder whether there is a trade-off between upholding the main principles at the root of fair trade versus developing the access to fair trade products for a greater range of consumers. Must fair trade products be reserved to specialized, *ad hoc* stores, or is it more relevant to make them enter the shelves of large-scale retailers ?

An important point to take into account when trying to bring pieces of answer to this question is the knowledge concerning consumers' interest for such products and the price they should accept to pay for them. Indeed, consumers' willingness-to-pay is a private parameter and a wide heterogeneity characterizes their interest for biologic or fair products. By the way, they are not always ready to implement what they prone for various reasons (their income and their priorities, the social picture dimension and its impact upon their purchases, the availability of such goods. . .). To put it in a nutshell, firms only have *a prioris* about consumers' taste for the product they offer. This information asymmetry (adverse selection) typically affects the price they can charge.

That's why this work will envisage this organisation question while taking into account the heterogeneity among consumers concerning their appetence for the good. To this end, we introduce uncertainty over the amount of income likely to be spent in biologic and/or equitable consumption and choose to generalize pricing schemes *via* instruments that make prices depend on the level of purchase (indeed, for instance, in some cases price advantages can be provided according the quantities traded).

Section 1 introduces the notions related to pro-social preferences upheld by many economic agents and, more especially, cooperation on the one hand and introduces the importance of information in particular as regard the "intentions-behaviour gap" on the other hand. Section 2 presents the framework of the common agency game model used. Section 3 tackles the initial setting of a unique level of firm (producers), highlighting the multistakeholder cooperative case regarded as the benchmark case. Section 4 introduces another tier in the game, namely a retailer, providing to differentiate the dedicated store case from the conventional channel. Section 6 concludes.

2 Fair trade : from the willingness-to-cooperate to the willingness-to-buy and -to-pay

2.1 Pro-social agents display a wish of cooperation

Sustainable trade (Geiger et al, 2018), which seeks to preserve ecologic and socio-economic conditions for coming generations being able to satisfy their needs, involves feeling concerned about a general interest dimension.

Fair trade belongs to a cooperative system. Indeed, according Bowles and Gintis (2011), cooperation refers to the action of engaging with others in a mutually profitable relationship, which is corresponds to one of the most fundamental principles of fair trade. Fair trade is narrowly related to the notion of cooperation, in its many dimensions, not only as a form of organization but also as a pro-social behavior.

Bowles and Gintis (2011) add that "*people cooperate not only for self-interested reasons but also because they are genuinely concerned about the well-being of others, try to uphold social norms, and value behaving ethically for its own sake*". As stressed by the IPSP report (2019)[5], this mechanism entails supporting collective actions directed towards "*the group's greater good*" even if it may be at the expense of individual welfare. Indeed, contributing to the success of a common project, though at an individual cost, triggers satisfaction, pride and even joy.

Following Laffont (1975) who explains pro-social behaviors through Kant categorical imperative rule[6], Roemer (2010)[7] shows that a cooperative behavior can emerge when preferences are enlarged and allow taking into account less standard arguments. In accordance with this view, Alger, Lehmann and Weibull (2018) confirm that "individual utility must integrate collective preferences such as altruism, equality or reciprocity".

Going beyond the conventional view that considers economic agents as individual maximizers, many researches have proven that other parameters were taken into account in decision-making processes. Benabou and Tirole (2006) explain that "people's actions reflect a variable mix of altruistic motivations, material self-interest and social or self-image concern".

In many cases, it can be qualified of genuine, disinterested, designing the fact of withdrawing satisfaction from others' pleasure (Andreoni, 1989). Yet, altruism can also be instrumental (Garapin, 2009) and reflect concerns about reciprocity, consistently with the feature of conditional cooperators suggested by Charness and Rabin (2002)[8]. Reputation concerns, the search for social approbation and even personal approbation are widely evidenced.

If altruism seems to be a pre-condition for cooperation to emerge, mutual trust, as stressed by Ostrōm (2015), is a necessary ingredient and values, as well as social rules of conduct (called institutions by Seabright, 2010), make it possible. Indeed, Ostrom's seminal work has shown that communication, trust, reputation and reciprocity were at the very heart of social link.

Besides, as reminded by Seabright (2010), only *homo sapiens* has conditioned her existence on the cooperation among unrelated individuals and emotions are at the heart of this process. Following Damasio (2007) who identified the link between reason and emotion, Gollier (2016) confirms that cognition and emotions are not independent. As they influence ex post utility, they also affect ex ante decisions, consistently with Sen (2009) argument about the narrow link between decision-making and emotional mechanisms. This is a very important finding as moral feelings affect the emergence of pro-social behaviors (Elster, 1998)[9]. Empathy fosters pro-social

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[5] See Annex 1 for more details.

[6] Kant's categorical imperative claims that the actions one should undertake are those one would advise to others, that could be universalized so as to make society as a whole better off.

[7] Roemer (2015) makes a clear distinction between altruism, supported by the desire to improve others' social welfare, and cooperation, which could derive from the want to help oneself.

[8] See Appendix 2 for precisions.

[9] For instance, Rabin (1993) presents the impact of anger and guilt on negative reciprocity and altruism.

behaviors (Kedia, 2009) and sustains the capacity to cooperate (Thoron, 2017). Singer and Fehr (2005) argue that the individuals who develop the greater form of emotional empathy are the most able to grasp others' mental spirit which may limit selfish tendencies and urge them to adopt more altruistic behaviors (as proved Artinger *et al.,* 2014)[10].

2.2   The "intentions-behaviour" gap

Fair trade consumers' intrinsic motivations, in particular in relation with the perceived efficiency of the system and their wish to be consistent with their values, play a fundamental part in their choices. Socially responsible products are different from conventional ones in that they bring consumers a private satisfaction and a utility related to the positive impact of this good for other social groups.

Beyond the intrinsic quality of the good, its social and environment characteristics are taken into account. A significant heterogeneity has been proved among consumers. Indeed, they can be distinguished with respect to their willingness-to-pay. Bougherara and Combris (2009) led an experiment that showed that consumers were willing to pay more when they received positive information about the product, which was confirmed by Disdier and Marette (2012). De Pelsmacker, Driesen et Rayp (2005) or Loureiro et Lotade (2005) proved, through contingent analysis, that consumers were ready to pay more for fair trade coffee with respect to conventional coffee. Besides, always in a fair-trade coffee setting, Arnot et al. (2006) observed that fair-trade coffee consumers were less sensible to price changes and kept on purchasing such a good even when the price rised.

There are various reasons to be interested in fair trade : the wish to enhance quality, to protect oneself (health. . .) or to protect environment. . .

As argued by Mann (2008), external preferences explain the willingness to-pay for fair trade goods[11]. Basil et al. (2006) stress the importance of both the sense of responsibility (related to a feeling of guilt) and the presence of others in prosocial behaviors - and on charitable donations in particular -. Doran (2008) highlights the role of benevolence in other-regarding concerns and behaviors and shows that this value is more widespread among fair traders. As far as they are concerned, De Pelsmacker et al. (2006) explain how personal norms and the attitude towards goods are impacted by the combination between awareness and emotional empathy.

It is important not only to understand the pro-social motivations at stake but also to get clues allowing to explain the "intentions-behaviour gap" which appears quite significant concerning fair trade or organic purchases.

Focusing on the gap between the ethical concerns expressed by citizens and their real purchases, Etilé and Teyssier (2013) stress two potential limits to a genuine responsible purchase : consumers' real willingness to pay, which depends on their income and their social preferences, and the degree of information asymmetry between the producer and the consumer that may deter responsible purchase behaviors (lack of information, lack of capacity to verify). Some piece

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[10]See for instance, Poteete, Janssen and Ostrom (2010).

[11]Becchetti and Rosati (2007) "intrinsic motivations, non-pecuniary incentives, inequity aversion, social preferences".

of explanation are given for instance by Carrington et al. (2010) who remind us of the role of personal values, moral norms on purchasing intentions but stress the weak actual involvement. As stressed by Konuk (2019), the increasing number of socially sensitive consumers induces a need to better find out about the factors that shape purchase intentions and disentangle them. The awareness of fair consumption implications appears as a predominant feature. A similar result is highlighted by Zerbini et al. (2019), who also consider the impact of emotional empathy on the willingness-to-buy fair trade goods. Besides, the origin and the type of production are presented by Sama et al. (2018) as the most valued attributes of a product by consumers. The author puts forward the fact that socially and environmentally responsible production systems and fair trade products provide a positive utility compared to conventional products.

De Pelsmacker and Jansseris (2006) show how willingness-to-buy is influenced by fair trade knowledge, perceived information both from a quantity and a quality point of view. Besides, Wang and Chen (2019) hint at the importance of trust in fair trade organization and the perceived effectiveness of their action for fair trade purchases.

Indeed, a main feature associated with fair trade is the degree of information asymmetry that separates producers from consumers. Balineau (2015) shows that bringing information concerning the product attributes and its mode of production should help consumers' purchase decision, enhance their trust towards this kind of goods and, consequently, develop the demand for fair trade products. As underlined by Balineau and Dufau (2010), stakeholders have to deal with two kinds of uncertainty as regards fair trade products. It is difficult to assess whether greater equity is actually reached, and to value the relevance of fair trade schemes, on the one hand, and to ascertain that all fair trade requirements are met on the other hand. This kind of uncertainty stems from the fact that fair trade products are differentiated through attributes that do not appear in the final good, the conditions of every stage of the production process are not publicly observed[12]. Balineau and Dufau (2010) explain that the fact that all actors are concerned by the first uncertainty prevents fair trade goods to be regarded as credence goods[13] *stricto sensu* and rather makes them likely to be assimilated to indeterminate goods in the sense of Lupton (2005)[14].

3   Framework and main assumptions

This model is derived from Lachet-Touya (2012).

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[12]Indeed, fair trade goods are neither search goods as consumers cannot learn their quality through a search process prior to purchasing them nor experience goods designing products the quality of which can be detected through consumption. As a consequence, fair trade actors have to send signals to consumers and certification by a third-party becomes essential.

[13]Darby and Karni's (1973, pp. 68–69) : "credence qualities are those which, although worthwhile, cannot be evaluated in a normal use. Instead the assessment of their values requires additional costly information". Bonroy and Constantatos (2008, pp. 238) add that a credence attribute is a "characteristic the quality of which cannot be evaluated even after consumption". Balineau and Dufeu (2010) relates the distinction between credence and search or experience goods to the level of cost consumers have to bear to assess their quality. See also Loureiro and Lotade (2005).

[14]Lupton, S. : 2005, 'Shared Quality Uncertainty and the Introduction of Indeterminate Goods', Cambridge Journal of Economics 29(3), 399–421.

3.1 Players of the game : the principals

Throughout the different settings that will be examined, various layers of firms will be considered : producers of the responsible (or fair trade) good at one tier, sellers at another tier that can be a dedicated store or conventional retailers.

We assume that the objective function of each decisionmaker may be composed of :

- the firm profits corresponding to the net receipts collected from the sales,

- the satisfaction of consumers (which may be regarded as a rent as it depends on their private taste for this good)

- the beneficial effects triggered by this activity in terms of social welfare (positive externalities from an environmental or social, or health point of view for instance).

3.2 Players of the game : the agents

In this context, it is equivalent to consider a continuum of consumers or a unique consumer (see for instance, in the tax litterature, Laussel and Lebreton, 1992, 1993).

We assume that consumers can buy the good supplied in a responsible way or can prefer a product manufactured by a conventional firm. The participation constraint of consumers writes $U \geq U_0 \geq 0$, since they can decide not to buy the good if it doesn't result profitable for them (i.e. if they do not derive a non-negative utility). U_0 can be set equal to 0. Consumers purchasing probability, tightly related to their willingness-to-pay for virtuous goods, remains the unknown parameter.

The price set by a firm i is π_i. We suppose $0 < \pi < 1$.

Consumer buying probability is $\Pr[\theta - \pi \geq 0] = 1 - \Pr[\theta \leq \pi] = 1 - F(\pi)$. Let θ, random variable defined on the set $\Theta = [\underline{\theta}; \overline{\theta}]$, characterized by the density function $f(\theta)$ and the cumulative distribution function $F(\theta)$, and the monotone likelihood ratio property $\dfrac{d\left[(1 - F(\theta))/f(\theta)\right]}{d\theta} \leq 0.$

Throughout the paper, we consider that the cumulative and the density function do not change whatever the decisionmaker.

3.3 Timing of the game

The game is an intrinsic common agency game[15] : consumers have to simultaneously accept or reject all the contracts offered to them.

1) Firms know the distribution of the random variable θ and choose the prices they are going to levy. The different layers of decisionmaking' *a prioris* concerning θ are assumed identical.

2) Consumers compare their willingness-to-pay to the price they are submitted to in order to acquire the product, then they decide to purchase it or not.

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[15] See Bernheim and Whinston (1986), Martimort and Stole (2004).

4 When producers act on their own

We consider a or several firms that transform the raw products provided by upstream farmers with whom they have contracted to build a fair trade relationship.

4.1 Programme of a standard decisionmaker

Let the standard objective function of a firm be likely to comprise sales receipts, the satisfaction consumers derive from the consumption of the good (which can be assimilated to an informational rent left to consumers as they have private information about their taste for responsible products) and the potential additional beneficial effects induced by this socially responsible activity for other stakeholders (for instance for the local community, on social climate, on health, on environment and biodiversity...) :

$$
\{(1+\alpha)(1+r)\pi[1-F(\pi)]-K\}+\left\{(1+\beta)\int_{\pi}^{\overline{\theta}} f(\theta)(\theta-\pi)\,d\theta\right\}+\{(1+\gamma)\varepsilon[1-F(\pi)]\}
\tag{1}
$$

with

ε the potential positive externalities triggered by fair trade, $0 \leq \varepsilon \leq 1$ (this external effect materializes if and only if the fair trade product is bought).

$0 \leq \alpha \leq 1$, $0 \leq \beta \leq 1$, $0 \leq \gamma \leq 1$ represent the extra-weights respectively put on the three previously described arguments of the objective function. The first term describes the utility derived from the firm, with r designing the reputation effect from which she benefits, the second term represents consumers' satisfaction and the last one corresponds to the externalities induced by responsible trade (a network effect acting as a driver on responsible production, benefits for employment, for biodiversity...).

The programme of the firm consists in setting the price that maximizes her objective function.

Maximizing the standard objective function with respect to π leads to the following first-order condition :

$$
\pi = -\frac{(1+\gamma)\varepsilon}{(1+\alpha)(1+r)} + \frac{\alpha + r(1+\alpha) - \beta}{(1+\alpha)(1+r)}\frac{1-F(\pi)}{f(\pi)}
\tag{2}
$$

4.2 Several competitive settings

4.2.1 If the decisionmaker seeks to attract consumers

This situation may arise either when there is strong horizontal competition or when the firm wants to foster her production and to expand her consumers base.

In such a case, $\alpha = \gamma = 0$

The corresponding price becomes

$$\pi_C = -\frac{\varepsilon}{1+r} + \frac{r-\beta}{1+r}\frac{1-F(\pi)}{f(\pi)}$$

with $(1+\beta)$ the extra-weight put on consumer' satisfaction : $0 \leq \beta \leq 1$.

The main goal is to develop the purchases of responsible goods and a way to help achieving it may lie in a price decrease. Either because competition is fierce or because the firm wants to differentiate herself and get an advantage, in order to attract consumers that might stay at the willingness-to-cooperate stage and not reach the willingness-to-pay one, the firm will prefer choosing limited prices.

It is important to note that this price can be positive if and only if externalities are not too important, the reputational impact strong or if the extra-weight put on consumers' satisfaction does not exceed a given threshold, as expressed below

$$\varepsilon < \frac{r-\beta}{1+r}\frac{1-F(\pi)}{f(\pi)} \;;\; \beta < r - \frac{\varepsilon}{\dfrac{1-F(\pi)}{f(\pi)}} \;;\; r > \varepsilon + \beta\frac{1-F(\pi)}{f(\pi)}$$

4.2.2 When the decisionmaking process focuses on firm's utility

Tihs framework may correspond to a setting involving few competition. As a by-product, the firm is leader on the market.

The price that maximizes her objective function writes

$$\pi_P = -\frac{\varepsilon}{(1+\alpha)(1+r)} + \frac{\alpha + r(1+\alpha)}{(1+\alpha)(1+r)}\frac{1-F(\pi)}{f(\pi)}$$

This price is higher than in the previous case.

4.3   Benchmark : the price is defined by a benevolent decisionmaker

These different settings may depend on the nature and the objective of the board.

A decisionmaker may be called benevolent when she equally takes into account all the arguments described above. It can be the case of a co-operative firm the board of which is composed of representatives of multiple stakeholders, for instance, namely a multistakeholders cooperative.

"*A co-operative is an autonomous association of persons united voluntarily to meet their common economic, social, and cultural needs and aspirations through a jointly owned and democratically-controlled enterprise*" (ICA, 2017).

Fleurbaey (2018) puts forward the social and economic advantages of democratic firms. "*Human-scaled firms that foster cooperation within their organization are much more effective at producing satisfactory results both for their bottom line and for their human impact.*" Indeed, they are likely to improve trust and cooperation among several kinds of stakeholders, to involve fewer negative externalities (environmental, social. . .) and better take into account the local dimension, to lessen the disruptive effects inherent to (fierce) competition and foster workers' commitment, to be less risky and more long run focused. The cooperative scheme is widespread and embodies quite well these principles.

Maximizing social welfare and optimizing with respect to π yields to an optimal price :

$$\overset{*}{\pi} = -\frac{\varepsilon}{1+r} + \frac{r}{1+r}\frac{1 - F\left(\overset{*}{\pi}\right)}{f\left(\overset{*}{\pi}\right)} \tag{2}$$

When the firm raises her price, she reduces costly rents to consumers and increases the amount of own receipts. But, on the other hand, the positive effects are lessened since the higher the price, the less the consumer is eager to acquire the good (an increase of the price reduces the sales base available and thus the level of receipts likely to be collected[16]).

4.4 Conclusion

There are differences in the level of prices according the nature of decisionmakers and their objective function(which can reflect the composition and the strategy of the board) :

- a utilitarist objective function that consists in maximizing an equally weighted programme made of the firm utility, consumer' satisfaction and the extra socio-economic benefits derived from responsible activity. This case is considered as the benchmark case

And two more extreme situations :

- a revenue maximization behavior,
- a strategy aiming at attracting consumers.

$$\pi_C < \overset{*}{\pi} < \pi_P$$

5 Necessity of a retailing channel

5.1 The choice of a dedicated network

The store or the retail organization makes no profit but receives a part of receipts to deliver the good and then share the benefits.

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[16]In a perfect information setting, the firms knows the price that can be defined to rapt all the surplus : $\overset{*}{\pi} = \theta = \frac{1 - G(\theta)}{g(\theta)}$. With information asymmetries, on the other hand, the determination of the unique price allows generating a kind of elasticity. Information asymmetries modify the strategy of the decisionmaker through a mechanism analogous to a horizontal competition exerting a downward pressure upon tax rates.

In such a framework, firms set their prices, collect sales receipts, transfer a part of them to the retailer and they benefit from communautary expenditures.

We consider that these expenditures depend on the receipts received by the upper level and, as a consequence, depend on the consumer' purchase probability. Thus, with n firms, and π_i the price applied by firm i, these transfers write $\sum_{i=1}^{n} \mu_i \pi_i \left[1 - F\left(\pi_i\right)\right]$, where μ_i is the fraction of receipts transferred to the higher level, $\mu_i \in \left[0; 1\right[$.

A firm i gets the following part from these expenditures $\gamma_i E(\sum_{i=1}^{n} \mu_i \pi_i \left[1 - F\left(\pi_i\right)\right])$, where γ_i represents the part of expenditures accruing to firm i, $\gamma_i \in \left[0; 1\right[$. For simplicity sake, we may consider that $E(\sum_{i=1}^{n} \mu_i \pi_i \left[1 - F\left(\pi_i\right)\right]) < \sum_{i=1}^{n} \mu_i \pi_i \left[1 - F\left(\pi i\right)\right]$. Besides, we assume that $E'\left(\cdot\right) > 0$ and $E"\left(\cdot\right) < 0$. It also seems quite consistent to consider that $\dfrac{dE}{d\pi_i} \leq 1$. Indeed, as on the one hand each firm contribution to the upper tier only represents a fraction of total receipts and, on the other hand the number of firms participating to the process is greater than two, then a rise in the price defined by one firm cannot trigger a greater rise in the amount of common expenditures.

If we consider the firm behavior, she sets π_i to maximize :

$$\left(1 - p_i\right)\left(1 + r\right)\pi_i\left[1 - F\left(\pi_i\right)\right] + \int_{\pi_i}^{\overline{\theta}} f\left(\theta\right)\left(\theta - \pi_i\right) d\theta \ + \varepsilon\left[1 - F\left(\pi_i\right)\right]$$

$$+\mu E\left(\sum_{i=1}^{n} p_i \pi_i \left[1 - F\left(\pi_i\right)\right]\right) - \mu C\left(\sum_{i=1}^{n}\left[1 - F\left(\pi_i\right)\right]\right)$$

The resulting price writes

$$\tilde{\pi}_c = \frac{\mu C'\left(\cdot\right) - \varepsilon}{\left(1 + r\right)\left(1 - p_i + \mu p_i E'\left(\cdot\right)\right)} + \frac{\left(1 + r\right)\left(1 - p_i + \mu p_i E'\left(\cdot\right)\right) - 1}{\left(1 + r\right)\left(1 - p_i + \mu p_i E'\left(\cdot\right)\right)} \frac{1 - F\left(\pi\right)}{f\left(\pi\right)} \qquad (3)$$

A condition must be set for the price to be non negative, for instance on the marginal cost or for the part represented by the cooperative which is an indicator of the degree of competition :

$$p_i \leq \overline{p} = \frac{r}{\left(1 + r\right)\left(1 - \mu E'\left(\cdot\right)\right)} + \frac{\mu C'\left(\cdot\right) - \varepsilon}{\left(1 + r\right)\left(1 - \mu E'\left(\cdot\right)\right)\dfrac{1 - F\left(\pi_i\right)}{f\left(\pi_i\right)}}$$

For weak externalities or for a significant reputation effect (or a low willingness-to-pay), the price can be postive.

If we compare to the benchmark case,

$$\tilde{\pi}_c - \overset{*}{\pi} = \frac{\mu C'\left(\cdot\right) - p_i\left(1 - \mu E'\left(\cdot\right)\right)\left(\varepsilon + \dfrac{1 - F\left(\pi_i\right)}{f\left(\pi_i\right)}\right)}{\left(1 + r\right)\left(1 - p_i + \mu p_i E'\left(\cdot\right)\right)}$$

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it appears that the price results higher[17] if the marginal cost is high or if

$$p_i < \frac{\mu C'(\cdot)}{(1 - \mu E'(\cdot))\left(\varepsilon + \dfrac{1 - F(\pi_i)}{f(\pi_i)}\right)}$$

When firms decide to sell their products through a dedicated entity which undertakes actions directed towards improving firms' working conditions, production processes and which offers them better conditions (services in health, education, culture...), the level of price may increase when there is competition at the upstream level or when the retailer marginal cost is high.

What's more, one of the conditions for the case to be valid is that the willingness-to-pay and the degree of externalities be weak (the proof with a uniform distribution function is available on request).

5.2 Responsible retailer

Such a retailer may be willing to reduce her margin and undertake a fair bargaining relationship with the upstream firm.

Consistently with this behaviour, the retailer objective function may set a higher weight upon consumers satisfaction and externalities. She may even integrate producers' utility.

$$\pi_{RR} = -\frac{(1 + \gamma_D)\varepsilon}{(1 + r_D)} + \frac{r_D - \beta_D}{(1 + r_D)}\frac{1 - F(\pi)}{f(\pi)} - \frac{1 + r}{(1 + r_D)}\pi$$

The total price responsible consumers have to pay for this good is the addition of the responsible retailer price with the multistakeholder cooperative tariff and becomes

$$\begin{aligned}
\pi^R &= \pi_{MC} + \pi_{RR} = -\varepsilon\left(\frac{1}{1 + r} + \frac{\gamma_D}{1 + r_D}\right) + \left(\frac{r}{1 + r} + \frac{r_D - \beta_D}{1 + r_D} - \frac{r}{1 + r_D}\right)\frac{1 - F(\pi)}{f(\pi)} \quad (3) \\
&= \frac{1}{(1 + r)(1 + r_D)}\left[-\varepsilon\left(1 + r_D + \gamma_D(1 + r)\right) + \left(r_D + 2rr_D - r^2 - \beta_D(1 + r)\right)\frac{1 - F(\pi)}{f(\pi)}\right]
\end{aligned}$$

Special case : if the reputation effects are identical, then the global price becomes

$$-\frac{1 + \gamma_D}{1 + r}\varepsilon + (r - \beta_D)\frac{1 - F(\pi)}{f(\pi)}$$

The difference between this price and the socially optimal one amounts to

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[17]which is necessarily true if

$$r > \frac{\varepsilon\left(\varepsilon - \mu C'(\cdot)\right)}{\varepsilon + (1 - \mu C'(\cdot))\dfrac{1 - F(\pi_i)}{f(\pi_i)}}$$

$$\frac{1}{1+r}\left(-\gamma_D\varepsilon + \frac{1-F(\pi)}{f(\pi)}\left(r^2 - \beta_D - \beta_D r\right)\right)$$

The difference is positive if the retailer valuations of the externalities and consumers' satisfaction are not over-weighted. On the other hand, if the weight put on consumers is high and outweights the reputation effect, the global price is lower than in the benchmark case.

The global price is equal to the socially optimal one if

$$r = \frac{1+\beta_D - \sqrt[2]{1+\beta_D{}^2 + 6\beta_D}}{2}$$

5.3 Concurrent pricing : when the good produced by a supplier is delivered through a retailing system

When sales are organised through a big chain retailing network, i.e. *via* a conventional channel, what is essential is the sharing of the bargaining power between both layers.

5.3.1 If both layers play Nash

This means that they make their princing decision independently and each one chooses unilaterally the level of price she wants to apply.

The price for a standard retailer objective function writes

$$
\begin{aligned}
\pi_R &= -\frac{(1+\gamma_D)\,\varepsilon}{(1+\alpha_D)\,(1+r_D)} + \frac{\alpha_D + r_D\,(1+\alpha_D) - \beta_D}{(1+\alpha_D)\,(1+r_D)}\frac{1-F(\pi)}{f(\pi)} \\
\pi^N &= -\varepsilon\left(\frac{1}{1+r} + \frac{1+\gamma_D}{(1+\alpha_D)\,(1+r_D)}\right) + \left(\frac{r}{1+r} + \frac{\alpha_D + r_D\,(1+\alpha_D) - \beta_D}{(1+\alpha_D)\,(1+r_D)}\right)\frac{1-F(\pi^N)}{f(\pi^N)}
\end{aligned}
$$

If the retailer wants to maximise her profits, the price becomes

$$
\begin{aligned}
\pi_R^P &= -\frac{\varepsilon}{(1+\alpha_D)\,(1+r_D)} + \frac{\alpha_D + r_D\,(1+\alpha_D)}{(1+\alpha_D)\,(1+r_D)}\frac{1-F(\pi)}{f(\pi)} \\
\pi^{NP} &= -\varepsilon\left(\frac{1}{1+r} + \frac{1}{(1+\alpha_D)\,(1+r_D)}\right) + \left(\frac{r}{1+r} + \frac{\alpha_D + r_D\,(1+\alpha_D)}{(1+\alpha_D)\,(1+r_D)}\right)\frac{1-F(\pi^N)}{f(\pi^N)}
\end{aligned}
$$

If the weight is put upon consumers, the price is

$$
\begin{aligned}
\pi_R^C &= -\frac{\varepsilon}{(1+r_D)} + \frac{r_D - \beta_D}{(1+r_D)}\frac{1-F(\pi)}{f(\pi)} \\
\pi^{NC} &= -\varepsilon\left(\frac{1}{1+r} + \frac{1}{(1+r_D)}\right) + \left(\frac{r}{1+r} + \frac{r_D - \beta_D}{(1+r_D)}\right)\frac{1-F(\pi^{NC})}{f(\pi^{NC})}
\end{aligned}
$$

the price can be positive if and only if the impact of the reputational effects are great and the additional weight weak.

If she is a social welfare maximiser

$$\pi_R = -\frac{\varepsilon}{(1+r_D)} + \frac{r_D}{(1+r_D)}\frac{1-F(\pi)}{f(\pi)} \tag{4}$$

$$\pi^{NB} = -\varepsilon\left(\frac{1}{1+r} + \frac{1}{1+r_D}\right) + \left(\frac{r}{1+r} + \frac{r_D}{1+r_D}\right)\frac{1-F(\pi^{NB})}{f(\pi^{NB})}$$

If this social welfare maximiser takes into account the cooperative satisfaction

$$\pi_R = -\frac{\varepsilon}{(1+r_D)} - \frac{1+r}{(1+r_D)}\pi + \frac{r_D}{(1+r_D)}\frac{1-F(\pi)}{f(\pi)} = \frac{r_D-r}{1+r_D}\frac{1-F(\pi)}{f(\pi)} \tag{5}$$

$$\pi^{NS} = \frac{-\varepsilon}{1+r} + \left(\frac{r}{1+r} + \frac{r_D-r}{1+r_D}\right)\frac{1-F(\pi^{NS})}{f(\pi^{NS})}$$

The global price charged is equal to the socially optimal one if the reputation effect is the same for both tiers of firms.

To some extend, this issue can be assimilated to a Kantian equilibrium.

5.3.2   In a Stackelberg situation

5.3.3   If the retailer plays first and impose her conditions to the producer

$$\frac{d\pi(\pi_R)}{d\pi_R} = \frac{r\dfrac{d}{dt}\left(\dfrac{1-F(\cdot)}{f(\cdot)}\right)}{1+r-r\dfrac{d}{dt}\left(\dfrac{1-F(\cdot)}{f(\cdot)}\right)}$$

$$\pi_R = -\frac{(1+\gamma_D)\varepsilon}{(1+\alpha_D)(1+r_D)} + \left(\frac{\alpha_D + r_D(1+\alpha_D) - \beta_D}{(1+\alpha_D)(1+r_D)} - \frac{r}{1+r}\frac{d}{dt}\left(\frac{1-F(\cdot)}{f(\cdot)}\right)\right)\frac{1-F(\pi)}{f(\pi)}$$

When the retailer increases her price, the cooperative reduces hers and the global price results inefficiently higher.

However, for a fair trade good, the cooperative cannot reduce her price, only maybe in the short run in order to have access to the shelves of the retailer. But were this process to last, fair trade principles couldn't be respected any more.

5.3.4 If the cooperative plays first

In such a case, she has the bargaining power as the retailer is eager to offer fair trade goods to her customers and must rely on fair trade suppliers which enables them to set their conditions.

$$\frac{d\pi_R(\pi)}{d\pi} = \frac{(\alpha_D + r_D(1 + \alpha_D) - \beta_D)\dfrac{d}{d\pi}\left(\dfrac{1 - F(\cdot)}{f(\cdot)}\right)}{(\alpha_D + r_D(1 + \alpha_D)) - (\alpha_D + r_D(1 + \alpha_D) - \beta_D)\dfrac{d}{d\pi}\left(\dfrac{1 - F(\cdot)}{f(\cdot)}\right)}$$

$$\pi_R^S = -\frac{(1 + \gamma_D)\varepsilon}{(1 + \alpha_D)(1 + r_D)} - \left(\frac{(1 + \beta_D)}{(1 + \alpha_D)(1 + r_D)} - \frac{\alpha_D + r_D(1 + \alpha_D) - \beta_D}{(1 + \alpha_D)(1 + r_D)}\frac{d}{d\pi}\left(\frac{1 - F(\cdot)}{f(\cdot)}\right)\right)\frac{1 - F}{f(\pi)}$$

The margin the retailer accepts can even be negative since she wants to gain customers.

Yet, the global price will result lower than the socially optimal one, which is not a desirable solution as the customer will not be able to grasp what is the real price of fair trade goods. This mechanism can only be temporary. We often can see rebates applied on fair trade transformed products such as coffee, chocolate, which corresponds to a strategu displayed by conventional retailers to attract responsible consumers and make them be used to including this kind of goods in their purchases.

6 Main results and conclusion

This work sheds some light on the respective advantages and drawbacks of various possible organisations for fair trade. It shows that the choice of a dedicated structure dos not necessarily appear as the solution, in particular when she has to bear important costs or when there is a great number of upstream production entities, these elements resulting conducive to an increase in prices. A sequential contracting process also seems to less interesting for social welfare. Last, when examining simultaneous price-setting schemes, it has been proved that the nature of the firms constitues a key criteria. What really counts is the convictions upheld by the firms, namely their willingness-to-be responsible actors aiming at improving social welfare. A benevolent objective function and a convergence of interests among all those who take part to the process can bring the outcome close to the socially optimal issue. As a by-product, a kind of Kantian equilibrium may arise, thanks to consumers pressure that will model firms' behaviours.

7 Appendix

7.1 Appendix 1

In 2017, the International Panel for Social Progress (IPSP) threw some light on the American citizens' feelings and expectations towards cooperation. A survey allowed to learn successfully how they considered the importance of competition and cooperation in various domains / fields of their everyday life (at work, in politics, at home, with social relationships. . .) and the feelings they had experienced in situations involving these mechanisms. The main results of this survey stressed a dominating preference for cooperation and the want to see more cooperation in politics especially. It also appeared that most respondents associated positive feelings to cooperation, such as elation, and praised its effectiveness in reducing stress and negative feelings.

7.2 Appendix 2

On the one hand, the dictator game[18] proves that genuine altruism is displayed by many players as they expect nothing in return for their unselfish choice. On the other hand, the ultimatum game[19], popularized by Thaler (1988), shows that the active player makes her decision in a way mutually profitable as the passive player will accept the offer if and only if she doesn't consider it as unfair. Reciprocity is an important motive for pro-social behaviors, as also stressed by Cueva and Dessi (2012). Besides, the investment game[20] indicates that taking into account others' welfare relates to social interactions.

7.3 Appendix 3 - From individual preferences to collective organizations

Beyond their economic role, their main goal is not to create profit but to comply with shared values so as to serve their members' economic and social needs and expectations. They are thus considered as democratic people-centered firms (ICA, 2018) able to "contribute to social equity and justice". Indeed, one of the most striking features of such organizations lies with the status of their members, who simultaneously own, monitor and run them. What's more, co-operatives have a long term economic activity horizon. Two essential kinds of advantages related to being member of a co-operative can be stressed : on the one hand the ability for producers to take part to the choices through the democratic process of decision-making, on the other hand their improved access not only to relevant prices and funding sources which increase income but

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[18] Kahneman, Knetsch and Thaler (1986)

[19] W. Güth, R. Schmittberger and B. Schwarze (1982) "An Experimental Analysis of Ultimatum Bargaining", Journal of Economic Behavior and Organization, 1982, 3, 367-388.

[20] J. Berg, J. Dickhaut and K. McCabe (1995) "Trust, reciprocity and social history", Games and Economic Behavior, 10, p. 122-142 ; C. Meidinger, S. Robin et B. Ru¢ eux (1999) "Con. . . ance, réciprocité et cheap talk", Revue Economique, vol.50, n 1, p. 5-44.

also to the provision of highly valuable services offered by the structure which allow improving returns and living conditions (investment in education, innovation, group purchasing, better selection of purchasing markets. . .). The economic stability is also ensured by the constitution of a reserve. This practice is seen as the first sustainable development practice since it allows answering current needs and at the same time increase the ability of future generations to answer them.

The notions of cooperation and mutual help were already present in A. Smith[21] and Saint-Simon was the first to require firms to be in collectivity's service. The interest for more democratic firms appeared with the development of social economy, as supported in particular by Dunoyer (1830)[22] through her moral approach of economics, de Sismondi who states that the real object of economy is human beings and not wealth, 19th century socialists as Owen or Gide who upheld a social economy based upon solidarity. Influent economists tackled this issue, as Mill who encouraged workers cooperatives, Walras (1896)[23] who defended the idea that the distribution of wealth should be "as equitable as possible" and who promoted cooperatives as a relevant mode of organization, or more recently Meade (1993).

The first co-operative was founded in England to enable its members to benefit from a better access to food, both from a revenue and a quality point of view, and decided to reinvest the profits derived in actions serving the community. Nearly one-third of co-operative entities in the world belong to the food and agriculture sector, in developed countries as well as in emerging economies where they help reaching food security and reducing poverty. Indeed, agricultural co-operatives represent a widespread form of organization in the world.

Beyond the traditional aim of serving the interests of the farmers who are members and owners of the co-operative, this latter exerts enlarged socio-economic impacts in the local area (in terms of revenue, employment, environment, reduction of inequalities. . .). These democratic structures play an important role in developing countries where they both improve farmers' living conditions and, as a by-product, those of the whole collectivity through the provision of fair remunerations and the investment of the premium in local services (health, education. . .)[24], and foster a sustainable agriculture that preserves environment and local communities.

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[21]Cf. the idea of "social commitments" that appear in the Theory of moral feelings.

[22]Traité d'économie sociale

[23]Walras, L. (1865) : Les Associations populaires de consommation, de production, et de crédit.

[24]The premium corresponds to the extra-price paid by consumers for the product with respect to the competition price. Indeed, co-operatives do not promote the lower price but a fair price.

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