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Claire Chambolle
Sylvaine Poret

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Laboratoire d'Organisation Industrielle Agro-Alimentaire

65 Bd Brandebourg

94205 IVRY Cedex

(33) 1 49 59 69 87

<mailto:lampenoi@ivry.inra.fr>

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Claire Chambolle* and Sylvaine Poret†

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Abstract

This paper focuses on a sustainable perspective of Fair Trade concept. We propose a simple model to provide some theoretical arguments in the debate about the sale of Fair Trade labeled goods in the large-scale distribution. The main hypothesis of our model is related to the observation that some consumers are willing to pay a premium for Fair Trade products. We underline that the key variable in the retailer's choice to sell the Fair Trade product is not the percentage of consumers who are willing to pay for a fair good, but how much the Fair Trade likers are willing to pay for it. We show that Fair Trade products are more likely to be on retailer's shelves if the certifier's objective is to maximize quantities labeled rather than the level of premiums paid to producers.

Keywords: D21, L22, L31.

JEL classification: fair trade, ethical premium, second-degree price discrimination, distribution.

*INRA-LORIA and Laboratoire Ecole Polytechnique-CECO. INRA-LORIA, 65 boulevard de Brandebourg 94205 Ivry-sur-Seine cedex - France. E-mail: chamboll@ivry.inra.fr.

†INRA-LORIA and CREST-LEI. INRA-LORIA, 65 boulevard de Brandebourg 94205 Ivry-sur-Seine cedex - France. E-mail: poret@ensae.fr.

1 Introduction

The growth of Fair Trade brings a large debate about the insertion of Fair Trade products into the conventional distribution network.¹ Indeed, fair trade organizations have a double purpose: to help producers from the South to improve their living conditions and to transform gradually international trade relations. Fair Trade being an alternative approach to conventional international trade, its consistency with the insertion of the Fair Trade products into the large-scale distribution appears as a great concern.

Fair Trade defines itself as a trading partnership, based on dialogue, transparency and respect, which seeks greater equity in international trade. It contributes to sustainable development by offering better trading conditions to, and securing the rights of, marginalized producers and workers, especially in the South.² In a practical hand, the fair trade movement attempts to eliminate middlemen in the chain and to guarantee a higher price to small producers.

Fair Trade started as a grassroots movement in the late 1960s in Europe. The aim was to alleviate poverty in the South by building direct, sustainable relationships with disadvantaged producers and providing fair access to markets in the North, using a strategy of “trade, not aid”. The alternative trade organizations (Non-Governmental Organizations) created a parallel retail network with specialty stores managed as cooperatives and staffed by volunteers.³ In 1988, a Mexican cooperative of coffee producers, who requested help in marketing their products in Europe, and a collaborator of a Dutch NGO conceived the idea of a Fair Trade label (Renard, 2003). Products bought, traded and sold respecting Fair Trade conditions would qualify for a label that would make them stand out among ordinary products on store shelves and would allow any company to get involved in fair trade. Thus, the “Max Havelaar” label was established in the Netherlands. In the late 1980s, similar non-profit Fair Trade organizations began labeling fair trade products to facilitate their entry into conventional markets in other countries (Raynolds, 2000). In 1997, the creation of the Fair trade Labeling

¹See, for example, the virtual symposium of some French Fair Trade actors in march 2004, « La grande distribution : l'avenir du commerce équitable ? » <http://www.changerdere.com/accueil/>.

²IFAT (International Federation for Alternative Trade) <http://www.ifat.org>

³Oxfam and Twin Trading (Great Britain), Stichting Ideeë Import (Netherlands) or Artisans du Monde (France) are some alternative trade organizations.

Organization International (FLO-I) united many of these labeling initiatives. FLO-I is now responsible for setting international Fair Trade standards for certifying production, trade and labeling of a certain number of products.

Fair Trade mainly concerns agriculture and handicraft products, but only agricultural ones more or less transformed (coffee, cocoa, tea, honey, sugar, rice, bananas, fruit juices,...) can be labeled. A third-party certification agency, member of the FLO network, is in charge of making sure that Fair Trade criteria are respected.⁴ The movement is a global network of producers, wholesalers, retailers, certification agencies, and consumers who commit themselves to the fair trade guidelines. Transparency is the core issue at all the levels of the production and distribution chains. Contrary to the other certification schemes, which focus strictly on conditions at the point of production, Fair Trade label is unique in that its criteria cover both trade and production conditions (Raynolds, 2000).

The label first guarantees general criteria.⁵ The producers have to follow certain agreements to qualify their products as fair trade. Small scale farmers/producers can only be certified Fair Trade if they have formed co-operatives, associations or other organizational entities which are democratically controlled and contribute to the social and economic development of its members. The producers must tend towards the use of environmentally sustainable agricultural practices and a production of quality. Trading standards stipulate that importers have to pay a price to producers that covers the costs of sustainable production and living. Producers can then invest this premium in development. As importers can pay a part of the production in advance when the producers ask for it, the latter can purchase the necessary raw materials to complete an order without falling into debt. Finally, traders must establish long-term working relationships and contracts with producers. Product-specific standards for each good that determine minimum quality, price, and processing requirements that have to be complied with, are determined and reviewed by FLO. For instance, Fair Trade coffee producers are guaranteed to earn at least US\$1.26 per pound. If the world market price is higher than this rate, importers pay a premium of US\$0.05 per pound

⁴For example, in the United-States, fair trade products bear the “Fair Trade Certified” label and the “Fair Trade Federation” logo. TransFair USA is the third-party certifier that places the “Fair Trade Certified” label on coffee, chocolate, cocoa, tea, bananas, and other fruits.

⁵See on the website of FLO-I, <http://www.fairtrade.net>, to find standards in general and for all goods.

more. Certified organic coffee gets a further premium of US\$0.15 per pound. In 2002, for arabica coffees, the difference between the Fair Trade price and the New York "C" price was equal on average to nearly US\$0.72 per pound (Giovannucci, 2003).

The annual aggregate net retail value of all Fair Trade products sold in Europe through alternative channels and supermarkets would exceed €260 million, of which €210 million for labeled products (EFTA, 2001). Fair Trade products are sold in the 2,700 or so world shops in Europe (18 countries) and they are available too in more than 43,000 supermarkets throughout Europe thanks to the labeling schemes. In North America (the US and Canada) and the Pacific Rim (Australia, New Zealand and Japan) Fair Trade market is later and less developed than the European one, but it is expanding much more rapidly. Total Fair Trade sales in these regions increased 37% during 2002, from US\$183 million to US\$251 million (FTF, 2003). In 2004, Fair Trade network represented 433 certified producer organizations and the number of registered traders increased from 297 from 2003 to 406 at the end of 2004 (see on the website of FLO-I, <http://www.fairtrade.net>).

More and more consumers know the concept of Fair Trade and declare in polls that they are willing to pay a higher price for a product with Fair Trade criteria. In Germany, according to recent market surveys, almost 37% of the population are willing to pay a higher price for coffee if it is guaranteed that the benefits are distributed to producers in developing countries. In addition, 40% of Germans believe Fair Trade is a good idea and 11% already buy TransFair-labelled tea or coffee, although the market shares of those products are equal to not more than respectively 2% and 1%. (EFTA, 2001). In a French study (AlterEco, 2004), to the question "why have you never bought Fair Trade products?" 39.1% of the 495 questioned people argue the lack of information, 36.7% declare not to know a retail outlet offering Fair Trade products, 20.3% give as a pretext a high price, and among the other arguments (32%), some people mention the lack of marketing for these products in retail outlets and others their consumption pattern. At the upstream of the labeled products network, coffee farmers' groups fail to sell, on average, more than 20% of their production to Fair Trade importers (Renard, 2005) and the fair coffee, the flagship product of the concept, accounts for only 0.34% of total coffee production. Thus, Fair Trade is curbed by the lack of market opportunities and its future depends on the consumers' better knowledge.

The introduction of Fair Trade products in big retail chains is a solution

to this double objective.⁶ But the viable niche markets created by Fair Trade attract dominant actors of the agri-food industry and of the large-scale distribution, who develop some strategies to benefit from the image associated with the Fair Trade values. At the moment, there appear some parallel labels based on other criteria, such as Rainforest Alliance associated with Kraft or the label “Bio Equitable” controlled by Ecocert in France. Some retailers create their fair private labels, certified or not by a Fair Trade label. Thus, to incorporate the large-scale distribution represents some risks. Given the market and buying powers of large retailers, they may impose their conditions: wholesale price cutting pressure, creation of less strict labels, risk of delisting, lack of long term contracts, and capture of the most lucrative niche. For some fair trade organizations, as Fédération Artisans du Monde, it is impossible to participate in large-scale distribution, because retailers are not ethic *per se*. Fair Trade organizations should avoid large retailers ran by multinationals who are part of the problem that Fair Trade is trying to fight against. The debate is acute in Fair Trade organizations, because some fair traders exclusively deal with big retailers.

We propose a simple model to provide some theoretical arguments in this debate. We want to explain the motivation of a retailer to sell some fair products and to show how a Fair Trade certifier can react to retailer’s different strategies according her preferences between fair price received by producers and quantities of fair product sold. The main hypothesis of our model is that some consumers, called Fair Trade likers, are willing to pay a premium for fair trade products which depends on the producers’ revenue. We underline that the key variable for a retailer is not the percentage of consumers who are willing to pay for a fair good but how much the Fair Trade likers are willing to pay for it.

From a theoretical point of view, this paper is related to two branches of the industrial organization literature: vertical relationships and second degree price discrimination. Indeed, we introduce a situation where some consumers are willing to pay for a non-tangible attribute of the product. The vertical differentiation is based not on a physical attribute but on a costless characteristic of the trade relationship.

Fair Trade is the object of some theoretical approaches (Adriani and Becchetti (2002), Becchetti, Solferino (2003), Immordino (2002)), but to our

⁶For example, in France in 2003, 66.9% of food purchases were made in supermarkets (INSEE, 2004).

knowledge the supply of fair products by retail chains has not yet been formalized.

This paper proceeds as follows. In the next section, we describe the assumptions of the model. In Section 3, we analyze the possible strategies of a retailer in front of the possibility to sell a fair product. Section 4 analyzes the upstream competition between a traditional producer and the Fair Trade certifier. Section 5 presents a conclusion.

2 The Model

2.1 The demand of fair trade

On the basis of a sample of 808 Belgian citizens and using conjoint analysis, De Pelsmacker, Driesen, Rayp (2005) study the importance of a fair trade label in the coffee buying decision and the willingness to pay for such a fair product. On average, a Fair Trade label is considered as the second most important coffee attribute, behind the brand and as important as aroma. The authors divide coffee buyers into four segments on the basis of the relative importance they attach to various coffee attributes (Brand, Blending, Flavor, Package, Fair Trade Label). 11% of the respondents expressed a high preference for Fair Trade label and are named “Fair Trade lovers”. For 40%, called the “fair trade likers”, Fair Trade label comes out as the most important attribute but not as the prominent one. The two other segments are the “flavor lovers” (24%) and the “brand lovers” (25%).

Based on this empirical study, we consider two varieties of the same good: the traditional product and a Fair Trade one. Unless both products have even qualities, the latter responds to fair trade criteria and is thus labeled by a certifier. A single retailer can list a Fair Trade product or/and the traditional one.⁷

In order to represent consumers who like fair trade, we distinguish two segments of consumers, Fair Trade likers and traditional consumers⁸. Thereby,

⁷We consider only one retailer, because, in most North countries, the food retailing is highly concentrated and thus each retailer has a strong market power (see Allain and Chambolle (2003) and Renard (2005)).

⁸Soberman and Parker (2004) propose a similar formalization in a paper devoted to private labels’ analysis. They distinguish two types of consumers: product seekers and brand seekers. The latter are willing to pay a premium for the national brand equal to the level of advertising realized by the firm.

we assume that the retailer faces a unitary market consisting of two segments of consumers: Fair Trade likers and traditional consumers. Let λ be the fraction of fair trade likers consumers. Furthermore, Fair Trade likers are concerned by small producers' welfare and they are willing to pay a premium for a Fair Trade product that we assume to be related to the wholesale price w_f paid to Fair Trade producers. This assumption also requires that the information about the wholesale price paid to small producers is delivered by the certifier to consumers. We thus define the demand function as follows:

$$d(p) = \begin{cases} 1 + \alpha w_f - p & \text{for the } \lambda \text{ \% of Fair Trade likers} \\ 1 - p & \text{for the } (1 - \lambda) \text{ \% of traditional consumers.} \end{cases}$$

The parameter $\alpha \in [0, 1]$ reflects the value granted by fair trade likers to the enhancement of producers' revenue, that is, the wholesale price they receive. We define it as the ethical premium parameter.

In other words, in the case where both products are sold, a fair trade liker buys the fair product if $\alpha w_f \geq p_f - p_t$, that is, if the evaluation of the fair characteristic is greater than the difference between prices of the two products and a traditional consumer chooses the traditional variety if $p_t < p_f$.

De Pelsmacker, Driesen, Rayp (2005) evaluate too the willingness to pay for a Fair Trade label. 35% of the respondents are willing to pay a price premium of 10%, 17% a premium of 20%, and 10% a premium equal to the average actual premium (27%). It is clear that the greater the premium price, the lower the number of people willing to pay for it. The data exhibit a negative correlation between the amount of the premium Fair Trade likers are ready to spend and the number of Fair Trade likers. Including such a correlation between α and λ in the model does not change our results.

2.2 The game

We analyze the following four stages game. In the first stage, the Fair Trade certifier chooses to supply the retailer or not. We assume that if the certifier decides that the Fair Trade product will not be present in supermarkets, she sells her product in specialized stores, where only the most convinced and involved consumers, the militants of the Fair Trade concept, go. In this instance, the traditional producer stays the sole supplier of the product to the retailer. In the second stage, the traditional producer and the Fair Trade

certifier choose simultaneously their unit wholesale prices, w_t and w_f , given their objective.⁹ In the third stage, the retailer chooses his product line. The retailer can either supply one product, fair trade (Strategy 3) or traditional product (Strategy 2), or both (Strategy 1). In the last stage of the game, the retailer sets prices for the product(s). To simplify the analysis and without loss of generality, we normalize to zero the marginal cost of production and retailing for the two products.

If the certifier has chosen to supply the retailer, the latter's objective functions according to the strategy chosen at the third stage of the game are as follows:

- Strategy 1: (T, F)

$$\pi_1^R(p_f, p_t, w_f, w_t) = \lambda(1 + \alpha w_f - p_f)(p_f - w_f) + (1 - \lambda)(1 - p_t)(p_t - w_t) \quad (1)$$

where p_f (resp. p_t) is the retail price for the fair product (resp. traditional brand). In this strategy 1, the retailer sells to fair trade likers the fair product bought at the wholesale price w_f set by the fair trade certifier, and sells to the other consumers the traditional brand bought at the wholesale price w_t set by the traditional producer.

- Strategy 2: (T)

$$\pi_2^R(p_t, w_t) = (1 - p_t)(p_t - w_t) \quad (2)$$

In this strategy 2, the retailer sells only the traditional brand. Since the fair product is not available on the market, all consumers buy the traditional brand.

- Strategy 3: (F)

$$\begin{aligned} \pi_{31}^R(p_f, w_f) &= [\lambda(1 + \alpha w_f - p_f) + (1 - \lambda)(1 - p_f)](p_f - w_f) \\ &\quad \text{when } p_f < 1 \\ \pi_{32}^R(p_f, w_f) &= \lambda(1 + \alpha w_f - p_f)(p_f - w_f) \\ &\quad \text{when } p_f > 1 \end{aligned} \quad (3)$$

⁹We consider only one traditional producer in order to avoid a competition effect between traditional producers. Moreover, in the coffee market, there are four main roasters: Kraft, Nestlé, Procter & Gamble, Sara Lee who jointly represent 40% of green coffee volumes. In France, the four groups represent more than three-fourths of the roast and ground market (Giovannucci, 2003). In the United States, two brands, Maxwell House (Kraft Foods) and Folgers (Procter & Gamble), represent 56% of the market (Ramirez-Vallejo, 2002).

In strategy 3, the retailer has chosen to offer only the fair product to consumers. Thus, if its retail price is lower than the traditional consumers' reservation price, all consumers buy the fair product. If the retail price of the fair product is higher than the traditional consumers' reservation price, only the Fair Trade likers buy this product.

We solve the game by backward induction.

3 The retailer's listing strategy

We first characterize the third stage subgame equilibrium where the retailer chooses his product line by comparing his profits, given the wholesale prices charged by the traditional producer and the Fair Trade certifier.

Proposition 1. *At the third stage, the retailer's choice depends on two thresholds of the Fair Trade product wholesale price,*

$$\tilde{w}_f(w_t, \alpha, \lambda) = \frac{1 - \sqrt{1 - (1 - \alpha^2\lambda)w_t(2 - w_t)}}{1 - \alpha^2\lambda} \quad \text{and} \quad \tilde{\tilde{w}}_f(w_t, \alpha) = \frac{w_t}{1 - \alpha}.$$

- (i). *If $w_f < \tilde{w}_f$, the retailer sells only the fair product, at a retail price such that all consumers buy it (strategy 3 case 1 - (F)).*
- (ii). *If $\tilde{w}_f < w_f < \tilde{\tilde{w}}_f$, the retailer sells both products (strategy 1 - (T,F)).*
- (iii). *If $w_f > \tilde{\tilde{w}}_f$, the retailer sells only the traditional product (strategy 2 - (T)).*

Proof. See the appendix A. □

The higher the Fair Trade wholesale price relatively to the traditional product wholesale price, the less likely the retailer is to sell the fair variety. These results are consistent with the intuition and are derived from three effects. We analyze these effects deriving the retailer's profit with respect to the fair trade wholesale price.

$$\begin{aligned} \frac{\partial \pi_1^R(w_f, w_t)}{\partial w_f} &= \frac{\lambda}{2} [-(1 - w_f + \alpha w_f) + \alpha(1 - w_f + \alpha w_f)] \\ &= [-q_f + \alpha q_f] < 0, \end{aligned} \tag{4}$$

where q_f denotes the quantity of Fair Trade product sold in the strategy 1.

The first effect is direct: a greater wholesale price for a product puts the retailer off distributing it.¹⁰ The second and third effects are related to the retailer's ability to discriminate between both segments of consumers. As some consumers grant some value to the producers' revenue, that is, the wholesale price, the retailer can, setting two prices, discriminate between consumers. The second one is due to the ethical premium as a whole, αw_f , and appears through the quantity, q_f . The third effect is due to the fact that the ethical premium is a function of the fair wholesale price, w_f , and corresponds to αq_f . This effect reduces the negative effect of the first one.

The subgame equilibrium of the stage 2 is represented by Figure 1 with $\alpha = 0.6$ and $\lambda = 0.25$. The two fair trade wholesale price thresholds are increasing in w_t . Moreover, $\tilde{w}_f(w_t, \alpha)$ is increasing in α and $\tilde{\tilde{w}}_f(w_t, \alpha, \lambda)$ is decreasing in α and λ . If the Fair Trade likers are willing to pay more for fair products and/or if the number of Fair Trade likers rises, a retailer who sold only the fair product may now rather offers two varieties of the good. This is because the retailer can better discriminate between consumers and increase the fair retail price.

If the Fair Trade wholesale price is too low ($w_f < \tilde{w}_f$) in comparison with the traditional product wholesale price w_t ($\tilde{w}_f < w_t$), the retailer chooses to offer only the Fair Trade product. The dominant effect is here the direct one related to the wholesale price.

For intermediate value of w_f ($\tilde{w}_f < w_f < \tilde{\tilde{w}}_f$), the retailer sells both products, even if the Fair Trade product's wholesale price is lower than the traditional brand one. Indeed, in the strategy 1,

$$p_f - p_t = \frac{1}{2}(w_f - w_t + \alpha w_f).$$

This is because the Fair Trade product retail price can be higher than the traditional product retail price, since the ethical premium allows the retailer to discriminate consumers. In addition, even when the fair wholesale price is greater than the traditional product one, the benefit of the discrimination is higher than its cost. This is all the more true when the consumer grants a high value to the wholesale price received by producers. Indeed, $\tilde{\tilde{w}}_f$ tends towards $+\infty$ when α tends towards 1 and it does not depend on λ . In other words, if Fair Trade likers are willing to pay the value of the Fair Trade

¹⁰We also find this effect in the case of the traditional good: $\frac{\partial \pi_1^R(w_f, w_t)}{\partial w_t} = -q_t < 0$, with q_t the quantity sold by the traditional producer in the strategy 1.

wholesale price as ethical premium, the retailer always chooses to sell the Fair Trade variety, even if its wholesale price is very high.

Beyond the threshold \tilde{w}_f , the retailer sells only the traditional product. Despite of the discrimination effect, the Fair Trade wholesale price is here too high and discourage the retailer from offering the Fair Trade product.

It is interesting to compare these results with those obtained with a slightly different demand function. In Figure 1, we compare the two fair wholesale prices thresholds to those, indexed by b , obtained using the following demand function

$$d^b(p) = \begin{cases} 1 + \alpha - p & \text{for the } \lambda \text{ \% of Fair Trade likers} \\ 1 - p & \text{for the } (1 - \lambda) \text{ \% of traditional consumers,} \end{cases} \quad (5)$$

where the evaluation of Fair Trade is independent of producers' revenue. The fair wholesale prices thresholds are then:

$$\tilde{w}_f^b = 1 - \sqrt{\alpha^2 \lambda + (1 - w_t)^2} \quad \text{and} \quad \tilde{w}_f = w_t + \alpha. \quad (6)$$

We show that \tilde{w}_f is always slightly greater than \tilde{w}_f^b and that \tilde{w}_f is greater than \tilde{w}_f^b only when $w_t > 1 - \alpha$. The most important difference between these results and the previous ones is that when α tends towards 1, \tilde{w}_f^b tends towards $1 + w_t$, while \tilde{w}_f tends towards $+\infty$. This is due to the fact that with a demand function independent of the fair wholesale price we do not obtain the third effect, the discrimination effect related to the fair wholesale price. Indeed, with this function,

$$\frac{\partial \pi_1^{Rb}(w_f, w_t)}{\partial w_f} = -\frac{\lambda}{2}[1 + \alpha - w_f] = -q_f < 0. \quad (7)$$

This allows us to infer that the third effect plays an important role when the ethical premium parameter, α , is high.

4 Upstream competition

In the second stage, the traditional producer and the fair trade certifier choose simultaneously the wholesale prices of their respective product, given their objective. The traditional producer maximizes his profit, but the Fair Trade certifier sets the wholesale price for the Fair Trade product on behalf of small producers she represents. We consider that she acts as a trade union.

4.1 The utility of the Fair Trade certifier

We assume that the utility of the Fair Trade certifier, $U(w_f, q_f)$, depends positively on the Fair Trade wholesale price, which determines the small producers' revenue, also as on Fair Trade quantity sold, which represents the number of small producers in the Fair Trade network. It is specified in a utilitarian form:

$$U(w_f, q_f) = (w_f - w_{\min})^\beta (q_f)^{1-\beta},$$

where β is the certifier's wholesale price preference parameter, with $\beta \in [0, 1]$, and w_{\min} the minimum wholesale price. We assume that the latter is equal to the production marginal cost, specified to zero. When $\beta = 0.5$, the utility of the Fair Trade certifier is equal to the total profit of small producers.

In strategies 1 and 3 when the fair retail price is higher than 1 (case 2), the objective function of the Fair Trade certifier is as follows

$$U_1(w_f) = U_{32}(w_f) = (w_f)^\beta \left(\frac{\lambda(1 - (1 - \alpha)w_f)}{2} \right)^{1-\beta}.$$

In strategy 3, when the fair retail price is lower than 1 (case 1), the fair trade certifier utility is

$$U_{31}(w_f) = (w_f)^\beta \left(\frac{(1 - (1 - \alpha\lambda)w_f)}{2} \right)^{1-\beta}.$$

These functions are concave in w_f . The two first order conditions allow us to obtain the optimal wholesale prices for the Fair Trade certifier without constraint,

$$\hat{w}_{f_3} = \frac{\beta}{1 - \alpha\lambda} = \arg \max_{w_f} U_{31}(w_f) \quad \text{and} \quad \hat{w}_{f_1} = \frac{\beta}{1 - \alpha} = \arg \max_{w_f} U_1(w_f),$$

increasing in parameters α , β , and λ for \hat{w}_{f_3} .

4.2 The results

To solve the game, we must find candidate equilibria for each third stage subgame and we need to check that any deviation strategy is not profitable for the traditional producer and the Fair Trade certifier.

CASE I: When $w_f < \tilde{w}_f = \frac{1 - \sqrt{1 - (1 - \alpha^2 \lambda) w_t (2 - w_t)}}{1 - \alpha^2 \lambda}$ (Condition I), the retailer sells only the Fair Trade product with a retail price lower than unit. Hence, the candidate equilibrium strategy is the strategy 3 - case 1 (F) with $w_f = \hat{w}_{f_3}$. This candidate must respect the condition I, that is,

$$w_t > 1 - \frac{\sqrt{(\beta(1 + \alpha\sqrt{\lambda}) - (1 - \alpha\lambda))(\beta(1 - \alpha\sqrt{\lambda}) - (1 - \alpha\lambda))}}{1 - \alpha\lambda} = \underline{w}_t,$$

and \underline{w}_t exists only if $\beta < \frac{1 - \alpha\lambda}{1 + \alpha\sqrt{\lambda}}$. If the certifier's wholesale price preference parameter is too high, she cannot propose a low wholesale price to the retailer. As in that case the traditional producer's profit is null, a profitable deviation for him is to propose a wholesale price lower than \underline{w}_t . Hence, in this case, the candidate is not robust to a deviation.

CASE II: When $\tilde{w}_f < w_f < \tilde{\tilde{w}}_f$ (Condition II), the candidate equilibrium strategy is the strategy 1 (F,T) with $w_f = \hat{w}_{f_1}$ and $w_t = \frac{1}{2}$, because the retailer sells both products and that $\hat{w}_{f_1} = \frac{\beta}{1 - \alpha} = \arg \max_{w_f} U_1(w_f)$ and $\hat{w}_{t_1} = \frac{1}{2} = \arg \max_{w_t} \pi_1^T(w_t)$.

The condition II is equivalent to:

$$\tilde{\beta}(\alpha, \lambda) = \left(\frac{1 - \alpha}{1 - \alpha^2 \lambda} \right) \left(\frac{2 - \sqrt{1 + 3\alpha^2 \lambda}}{2} \right) < \beta < \frac{1}{2}$$

The traditional producer's profit and the certifier's utility are thus

$$\pi_1^T(1/2) = (1 - \lambda) \frac{1}{8} \quad \text{and} \quad U_1(\hat{w}_{f_1}) = \left(\frac{\beta}{1 - \alpha} \right)^\beta \left(\frac{\lambda(1 - \beta)}{2} \right)^{1 - \beta}.$$

We must verify that no deviation from this candidate equilibrium strategy is profitable for both agents.

- Producer deviation

The deviation for the traditional producer is to reduce w_t such that $\hat{w}_{f_1} = \frac{\beta}{1 - \alpha} > \tilde{w}_f = \frac{w_t}{1 - \alpha}$, that is, $w_t < \beta < \frac{1}{2}$. Such a deviation is profitable for the traditional producer if and only if $\pi_2^T(\beta) > \pi_1^T(1/2)$, that is,

$$\lambda > (1 - 2\beta)^2. \tag{8}$$

When the proportion of fair likers is high, if the traditional producer chose the accommodation strategy, he would lose many customers; then, it is profitable for him to deviate.

Equation (8) is equivalent to

$$\beta > \frac{1 - \sqrt{\lambda}}{2}. \quad (9)$$

If the certifier favours quantities sold, her optimal wholesale price in the strategy 1 (F,T) is relatively low. Thus the traditional producer cannot offer to the retailer a lower wholesale price in order to be the sole supplier and he accommodates.

- Certifier deviation

- When $\hat{w}_{f_3} < \tilde{w}_f$, that is, $\beta < \frac{1-\alpha\lambda}{1-\alpha^2\lambda} \left(\frac{2-\sqrt{1+3\alpha^2\lambda}}{2} \right) = \tilde{\beta}(\alpha, \lambda)$, the possible deviation is \hat{w}_{f_3} and this deviation is profitable if:

$$U_{31}(\hat{w}_{f_3}) > U_1(\hat{w}_{f_1}), \quad (10)$$

that is,

$$\beta < \beta^*(\alpha, \lambda) = \frac{\ln \lambda}{\ln [\lambda(1 - \alpha)] - \ln (1 - \alpha\lambda)}, \quad (11)$$

with $\beta^*(\alpha, \lambda) > \tilde{\beta}(\alpha, \lambda)$.¹¹

The certifier deviates from the candidate equilibrium when her preference for the wholesale price is low (low β). This is because in this case she can offer to the retailer a lower wholesale price for the fair product than the traditional one and become the sole supplier of the product.

This can be expressed differently. Indeed, Equation (10) is also equivalent to

$$\alpha < \alpha^*(\beta, \lambda) = \frac{1 - \lambda^{\frac{1-\beta}{\beta}}}{1 - \lambda^{\frac{1}{\beta}}}. \quad (12)$$

The certifier deviates from the candidate equilibrium if her ethical premium parameter is relatively low¹². As $\beta < \frac{1}{2}$, the certifier prefers to sell a high quantity of product rather than to sell it at a high wholesale

¹¹Indeed, $\beta^*(\alpha, \lambda) > \tilde{\beta}(\alpha, \lambda)$ because $\tilde{w}_f < \frac{1}{2}$ and $U_3(w_f) > U_1(w_f)$ when $w_f < 1$.

¹²From (13) and (12) we can see that $\alpha^*(\lambda) = \alpha^* \left(\beta = \frac{1-\sqrt{\lambda}}{2}, \lambda \right)$.

price and $\widehat{q}_{f_3} = \frac{1-\beta}{2} > \widehat{q}_{f_1} = \frac{\lambda(1-\beta)}{2}$. She can offer a low wholesale price ($\widehat{w}_{f_3} = \frac{\beta}{1-\alpha\lambda}$) to the retailer and eliminate the traditional producer only if the ethical premium parameter is low, that is, if the Fair Trade likers are willing to pay not much for a Fair Trade product. As $\beta < \frac{1}{2}$, it is easy to show that $\alpha^*(\beta, \lambda) > \frac{1}{2}$.

Equation (10) can be solved using the other variable qualifying the Fair Trade likers, their number. Indeed, Equation (10) is equivalent to

$$(1 - \alpha\lambda)^\beta \lambda^{1-\beta} < (1 - \alpha)^\beta.$$

By studying the function $g(\lambda) = (1 - \alpha\lambda)^\beta \lambda^{1-\beta}$, it is easy to show that

- if $\alpha + \beta < 1$, the certifier always deviates from the candidate equilibrium and
- if $\alpha + \beta > 1$, it exists a threshold $\lambda^*(\alpha, \beta)$ ($\lambda^*(\alpha, \beta) < \frac{1-\beta}{\alpha}$) such that
 - * if $\lambda < \lambda^*(\alpha, \beta)$, the certifier deviates from the candidate equilibrium and
 - * if $\lambda > \lambda^*(\alpha, \beta)$, she chooses the accommodation strategy.

The aim of this analysis is to show that the most important parameter qualifying the consumers' behavior in relation to the fair trade is the the Fair Trade consumers' willingness to pay for a fair product.

- When $\widehat{w}_{f_3} > \widetilde{w}_f$, that is, $\widetilde{\beta}(\alpha, \lambda) < \beta$, the possible deviation is \widetilde{w}_f and this deviation is profitable for the certifier if and only if

$$U_{31}(\widetilde{w}_f) > U_1(\widehat{w}_{f_1}).$$

But, as $\widetilde{\beta}(\alpha, \lambda)$ is decreasing in α and $\widetilde{\beta}(\alpha = 1, \lambda) > \frac{1-\sqrt{\lambda}}{2}$, we obtain that $\widetilde{\beta}(\alpha, \lambda) > \frac{1-\sqrt{\lambda}}{2}$.

Thus, if $\beta^*(\alpha, \lambda) < \beta < \frac{1-\sqrt{\lambda}}{2}$, none of the two agents deviate from the candidate equilibrium strategy (F,T) with $w_f = \widehat{w}_{f_1}$ and $w_t = \frac{1}{2}$. Moreover, $\beta^*(\alpha, \lambda) < \frac{1-\sqrt{\lambda}}{2}$ if

$$\alpha > \frac{1 - \lambda^{\frac{1+\sqrt{\lambda}}{1-\sqrt{\lambda}}}}{1 - \lambda^{\frac{1-\sqrt{\lambda}}{2}}} = \alpha^*(\lambda). \quad (13)$$

CASE III: When $w_f > \tilde{w}_f$ (Condition III), the retailer sells only the traditional product. Hence, the candidate equilibrium strategy is the strategy 2 (T) with $w_t = \frac{1}{2}$, since $\frac{1}{2} = \arg \max_{w_t} \pi_2^T(w_t)$. This candidate must respect the condition III, that is,

$$w_f > \frac{1}{2(1-\alpha)}$$

As in that case the certifier's utility is null, a profitable deviation for her is to propose a wholesale price just lower than $\frac{1}{2(1-\alpha)}$. Thereby the candidate equilibrium is not robust to a deviation.

Results regarding the second stage of the game are summarized in Proposition 2:

Proposition 2. *When $\beta^*(\alpha, \lambda) < \beta < \frac{1-\sqrt{\lambda}}{2}$, the Fair Trade certifier can enter in the market without triggering a price war with the traditional producer. The equilibrium wholesale prices are then $w_f = \hat{w}_{f_1}$ and $w_t = \frac{1}{2}$ and the retailer sells both products.*

The threshold value of β , β^* , is decreasing with the fraction of the Fair Trade likers, λ , and decreasing with the ethical premium parameter, α . The other threshold is decreasing in λ . If the ethical premium parameter increases, the area where the certifier accommodates is greater. The higher the Fair Trade likers' willingness to pay for a fair product, the more likely this product is to be on the shelves of the supermarkets next to the traditional product. The effect of an increase in the percentage of the Fair Trade likers is not so clear. If more people are willing to buy a Fair Trade product, two effects appear. The positive effect is related to the certifier's behavior. When the number of Fair Trade likers increases, with the strategy 1 (F,T) she gets more customers and with the strategy 3 case 1 (F) she obtains a higher wholesale price. As $\beta < \frac{1}{2}$, she prefers to sell a higher quantity of product, and thus she prefers the strategy 1 (F,T), that is, the accommodation strategy. The negative effect is due to the traditional producer's strategy. If the number of fair trade likers increases, he deviates from the candidate equilibrium more frequently because by accommodating he loses more customers. The net effect of an increase in the number of Fair Trade likers is unclear.

We have shown that $\beta^*(\alpha, \lambda) < \frac{1-\sqrt{\lambda}}{2}$ if $\alpha > \alpha^*(\lambda) > \frac{1}{2}$. Then, the fair trade certifier can see fair products marketed by the retailer only when the

ethical premium parameter is high, that is, when the fair trade likers are willing to pay much more for a fair product.

These results show that the most important parameter for the fair trade is how much Fair Trade likers are willing to pay for a fair trade product. As a consequence, if the Fair Trade certifier wants to see fair products in the shelves of supermarkets, the main consumers' characteristic, which she has to take into account in deciding, is not the percentage of consumers ready to buy a fair trade product but how much this type of consumers are willing to pay for this product.

This result is easily understandable from the retailer's point of view. Indeed, products from labelled Fair Trade are mainly food products already on the shelves of supermarkets in their traditional format. All consumers buy it even if it is not fair. Thus, the retailer is interested by a fair product only if its wholesale price is lower than the one of the traditional good or if he can discriminate between Fair Trade likers and other consumers with a relatively high retail price for the fair product. The first one can not appear because that involves a price war with the traditional producer and the certifier does not want to enter in the market in this condition. The second solution is feasible only if the fair trade likers give an enough large value to the ethical characteristic of a product. Otherwise, when the ethical premium is low, the two products are not enough different from the consumers' point of view and the competition between the traditional producer and the certifier is too strong. Thus, if the certifier enters in the market, a price war occurs with the traditional producer discrimination difference. As a result, the Fair Trade certifier prefers to stay out the market. Thus, a strong label enables the retailer to benefit from a discrimination strategy between fair trade likers and traditional consumers. These results can be related to the differentiation principle: firms use vertical product differentiation to relax price competition (Shaked and Sutton (1982), Gabszewicz and Thisse (1979)).

At the equilibrium with the two products, the retail prices are $p_t = \frac{3}{4}$ and $p_f = \frac{1}{2} + \frac{\beta(1+\alpha)}{2(1-\alpha)}$. The retailer's profit is then equal to $\frac{\lambda(1-\beta)^2}{4} + \frac{(1-\lambda)}{16} > \frac{1}{16}$, the traditional producer's profit is equal to $\frac{1-\lambda}{8}$ and the Fair Trade likers' surplus is $\frac{(1-\beta)^2}{8} > \frac{1}{32}$. When Equation (8) and (11) are satisfied, that is, when the traditional product is the sole product present in supermarkets, the retailer's profit and the traditional producer's one are respectively equal to $\frac{1}{16}$ and $\frac{1}{8}$. We can see that the loser of the entry of the Fair Trade product in supermarkets is the traditional producer. This can explain that several traditional

producers have developed their own label similar to the concept of fair trade, such as chocolate French company Cémoi with «Bio Equitable» (Organic Fair Trade) or the partnership between Kraft and Rainforest Alliance.

4.3 Comparison

Introducing the fair wholesale price-independent demand function (5) make the model more difficult to solve. But it is interesting to study it, because the labels brought in by the traditional producers do not mention the price criterion. We then resume the resolution of the game at the second stage.

CASE I: If $w_f < \tilde{w}_f^b = 1 - \sqrt{\alpha^2\lambda + (1 - w_t)^2}$ (Condition I^b), the retailer sells only the Fair Trade product with a retail price lower than unit. Hence, the candidate equilibrium strategy is the strategy 3 - case 1 (F) with $w_f = \hat{w}_{f_3}^b = \beta(1 + \alpha\lambda) = \arg \max_{w_f} U_{31}^b(w_f)$.

This candidate must respect the condition I^b, that is,

$$w_t > 1 - \sqrt{(1 - \alpha\sqrt{\lambda} - \beta(1 + \alpha\lambda))(1 + \alpha\sqrt{\lambda} - \beta(1 + \alpha\lambda))} = \underline{w}_t^b,$$

and \underline{w}_t^b exists only if $\beta < \frac{1 - \alpha\sqrt{\lambda}}{1 + \alpha\sqrt{\lambda}}$.

As in that case the traditional producer's profit is null, a profitable deviation for him is to propose a wholesale price lower than \underline{w}_t^b . Hence, in this case, the candidate strategy is not robust to a deviation.

CASE II: If $\tilde{w}_f^b < w_f < \tilde{w}_f^b$ (Condition II^b), the candidate equilibrium strategy is the strategy 1 (F,T) with $w_f = \hat{w}_{f_1}^b = \beta(1 + \alpha) = \arg \max_{w_f} U_1^b(w_f)$ and $w_t = \frac{1}{2}$, because the retailer sells both products.

The condition II^b is equivalent to:

$$\tilde{\beta}^b(\alpha, \lambda) = \frac{2 - \sqrt{1 + 4\alpha^2\lambda}}{2(1 + \alpha)} < \beta < \frac{1 + 2\alpha}{2(1 + \alpha)} = \beta^b(\alpha)$$

The traditional producer's profit and the certifier's utility are thus

$$\pi_1^T(1/2) = (1 - \lambda)\frac{1}{8} \quad \text{and} \quad U_1^b(\hat{w}_{f_1}^b) = (\beta(1 + \alpha))^\beta \left(\frac{\lambda(1 + \alpha)(1 - \beta)}{2} \right)^{1-\beta}.$$

We must verify that no deviation from this candidate equilibrium strategy is profitable for both agents.

- Producer deviation

The deviation for the traditional producer is to reduce w_t such that $\widehat{w}_{f_1}^b = (\beta)(1 - \alpha) > \widetilde{w}_f^b = w_t + \alpha$, that is, $w_t < \beta(1 + \alpha) - \alpha = \underline{w}_t^b < \frac{1}{2}$. Such a deviation is profitable for the traditional producer if and only if $\pi_2^T(\underline{w}_t^b) > \pi_1^T(1/2)$, that is,

$$\beta > \frac{1 + 2\alpha - \sqrt{\lambda}}{2(1 + \alpha)} = \beta^{*T}(\alpha, \lambda). \quad (14)$$

The threshold $\beta^{*T}(\alpha, \lambda)$ is increasing in α and decreasing in λ . If the number of Fair Trade likers is low (low λ), the traditional producer rarely deviates from the candidate equilibrium, because by accommodating he does not lose a lot of customers and he can offer a higher wholesale price. This result is qualitatively the same than in the case of the ethical premium dependent of the the Fair Trade wholesale price. If the Fair Trade likers are willing to pay less for a fair product, other things being equal, the traditional producer deviates more frequently from the candidate equilibrium strategy. Indeed, in this case, the certifier has a less valuable asset ahead of the retailer. The competition between the two suppliers is stronger and thus the traditional producer deviates more often from the candidate equilibrium with the two products on the retailer's listing.

As $\beta^{*T}(\alpha = 0, \lambda) = \frac{1 - \sqrt{\lambda}}{2}$ and this threshold is increasing in α , $\beta^{*T}(\alpha, \lambda)$ is greater than the traditional producer's β -threshold obtained with a fair wholesale price-dependent demand. He deviates less often when the demand is independent of the fair wholesale price.

- Certifier deviation

- If $\widehat{w}_{f_3}^b < \widetilde{w}_f^b$, that is, $\beta < \frac{2 - \sqrt{1 + 4\alpha^2\lambda}}{2(1 + \alpha\lambda)} = \widetilde{\beta}^b(\alpha, \lambda) < \frac{1}{2}$, the possible deviation is $\widehat{w}_{f_3}^b$. The certifier deviates from the candidate equilibrium if

$$U_{31}^b(\widehat{w}_{f_3}^b) > U_1^b(\widehat{w}_{f_1}^b),$$

that is,

$$\beta < 1 - \frac{\ln \frac{1 + \alpha\lambda}{1 + \alpha}}{\ln \lambda}, \quad (15)$$

but this threshold is greater than $\frac{1}{2}$. Thus, whatever $\tilde{\beta}^b(\alpha, \lambda) < \beta < \tilde{\beta}^b(\alpha, \lambda)$, that is, when her preference for the wholesale price is relatively low, the certifier deviates from the candidate equilibrium.

- If $\hat{w}_{f_3}^b > \tilde{w}_f^b$, that is, $\tilde{\beta}^b(\alpha, \lambda) < \beta$, the possible deviation is \tilde{w}_f^b and this deviation is profitable for the certifier if and only if

$$U_{31}^b(\tilde{w}_f^b) > U_1^b(\hat{w}_{f_1}^b).$$

It exists an implicit threshold $\beta^{*C}(\alpha, \lambda)$ such as

- if $\beta < \beta^{*C}(\alpha, \lambda)$, the certifier deviates from the candidate equilibrium and
- if $\beta > \beta^{*C}(\alpha, \lambda)$, the certifier accommodates.

Since $\hat{w}_{f_1}^b > \hat{w}_{f_3}^b > \tilde{w}_f^b$, the threshold $\beta^{*C}(\alpha, \lambda)$ is decreasing in α and in λ . These results are similar to the ones obtained with the ethical premium dependent of the fair wholesale price.

If $\tilde{\beta}^b(\alpha, \lambda) > \beta^{*T}(\alpha, \lambda)$, that is, if the ethical premium is low, the candidate equilibrium is not stable.¹³

If $\tilde{\beta}^b < \beta^{*C} < \beta < \beta^{*T}$, no deviation is profitable and the equilibrium strategy is the strategy 1 (F,T) with $w_f = \beta(1 + \alpha)$ and $w_t = \frac{1}{2}$.

CASE III: If $w_f > \tilde{w}_f^b$ (Condition III^b), the retailer sells only the traditional product. Hence, the candidate equilibrium strategy is the strategy 2 (T) with $w_t = \frac{1}{2}$. This candidate must respect the condition III^b, that is,

$$w_f > \alpha + \frac{1}{2}.$$

As in that case the certifier's utility is null, a profitable deviation for her is to propose a wholesale price lower than $\alpha + \frac{1}{2}$. In this case, the candidate is not robust to a deviation.

Results are summarized in Proposition 3:

¹³Since $\tilde{\beta}^b(\alpha, \lambda)$ is decreasing in α and λ , $\beta^{*T}(\alpha, \lambda)$ is increasing in α and decreasing in λ , and given the values of these functions for the extreme values of α and λ , it is easy that to show that it exists a $\tilde{\alpha}(\lambda)$ such that if $\alpha < \tilde{\alpha}(\lambda)$, $\tilde{\beta}^b(\alpha, \lambda) > \beta^{*T}(\alpha, \lambda)$.

Proposition 3. *In a model with a fair wholesale price-independent demand function, if the ethical premium is enough high and if $\beta^{*C}(\alpha, \lambda) < \beta < \beta^{*T}(\alpha, \lambda)$, no deviation is profitable and the equilibrium strategy is the strategy 1 (F, T) with $w_f = \beta(1 + \alpha)$ and $w_t = \frac{1}{2}$.*

When the ethical premium is independent of the fair wholesale price, results are qualitatively similar to those obtained with an ethical premium related to the wholesale price.

At the equilibrium with the two products, the retail prices are $p_t = \frac{3}{4}$ and $p_f = \frac{(1+\beta)(1+\alpha)}{2}$. The retailer's profit is then equal to $\lambda(1 - \beta)\frac{(1+\alpha)^2}{4} + \frac{(1-\lambda)}{16} > \frac{1}{16}$, the traditional producer's profit is equal to $\frac{1-\lambda}{8}$ and the Fair Trade likers' surplus is $\frac{((1+\alpha)(1-\beta))^2}{8} > \frac{1}{32}$. By comparing these results to ones obtained with the demand dependent of the fair wholesale price, we can observe that the retailer's profit and Fair Trade likers' surplus are lower with the w_f -dependent demand function. That means that, when the fair trade likers take into account the value of small producers' revenue in the premium they allocate to the fair characteristic of products, the certifier can extract more surplus from the retailer and consumers who adhere to the Fair Trade concept. Indeed, she can negotiate a higher fair wholesale price.

5 Conclusion

This article provides some arguments in the debate about the introduction of Fair Trade goods in the large-scale distribution. In order to see fair products on shelves of supermarkets, that is, to be in the market, the Fair Trade certifier must have an average wholesale preference parameter. But if the consumers who like fair trade products allocate to them a low value, even though there are numerous people, the certifier cannot enter in the large-scale distribution without triggering a price war with the traditional producer. Then, she prefers stay out the conventional market. This allows to say that the most important parameter for the fair trade is not the number of consumers who are willing to pay an ethical premium for a fair product but how much these consumers are willing to pay for it. This is because the retailer can sell in any way the product whether it is equitable or not. The greater the fraction of Fair Trade likers, the more the retailer can discriminate between the two segments of consumers and want to market both varieties of the product. The Fair Trade organizations communicate a lot about the number

of people who are willing to pay a higher price for a Fair Trade product, but for the introduction of this kind of good in the large-scale distribution, the main criterion is the premium that these people are willing to pay, an attribute more difficult to evaluate.

Our results are qualitatively the same than the ones obtained with a demand function where the evaluation of Fair Trade does not depend on producers' revenue. But, with the hypothesis of the fair wholesale price-dependent demand function, we show that the Fair Trade certifier succeeds in negotiating a higher fair wholesale price for small producers. This suggests that Fair Trade organizations should communicate much more about the minimum price paid to small producers. This could avoid the consumers' confusion in the choice between internationally recognized labels and labels based on weaker criteria. Concerning that, we can notice the French government initiative. Before the development of the food companies and distributors various initiatives in order to create their own Fair Trade labels, French authorities have tried to draw up a standard for the regulation of the Fair Trade market. After four years of thought and debates between Fair Trade actors, importers, distributors, NGO, consumers, the French norms body, AFNOR, published a reference text (Accord AC X50-340) in January 2006, the first one, which will provide a framework for future regulation, at the European level for example. This text retains three main principles: a balanced trading relation between contractors; follow up activities in support of producers and producers' organizations; information and awareness raising for consumers and the general public in relation to Fair Trade. Moreover, in the bill of the small and medium enterprises law (August 2, 2006 - Article 60), reference to the minimum prices and criteria recognized by Fair Trade international federations is explicitly mentioned.

The next logical step in the problematic of Fair Trade would be to verify the hypothesis of Alternative Trading Organisations which suggest that by paying a fair price for even a small part of production, a snowball effect appears on prices paid for the rest of production (Bowen, 2001).

A Proof of Proposition 1

At Stage 3 of the game, the retailer chooses retail prices of products according his strategy.

- Strategy 1: (T, F)

The condition of positive quantity of fair product is $w_f < \frac{1}{1-\alpha}$.

The retail prices are $p_f = \frac{1+(\alpha+1)w_f}{2}$ and $p_t = \frac{1+w_t}{2}$ and the retailer's profit is $\pi_1^R(w_f, w_t) = \lambda \left(\frac{1+\alpha w_f - w_f}{2} \right)^2 + (1-\lambda) \left(\frac{1-w_t}{2} \right)^2$

- Strategy 2: (T)

$$p_t = \frac{1+w_t}{2} \text{ and } \pi_2^R(w_t) = \left(\frac{1-w_t}{2} \right)^2$$

- Strategy 3: (F)

Case 1: $p_f < 1$

$$p_f = \frac{1+(\alpha\lambda+1)w_f}{2} \text{ with } p_f < 1 \Leftrightarrow w_f < \frac{1}{\alpha\lambda+1} = \overline{w_{f1}} \text{ and}$$

$$\pi_{31}^R(w_f) = \left(\frac{1+\alpha\lambda w_f - w_f}{2} \right)^2$$

Case 2: $p_f > 1$

$$p_f = \frac{1+(\alpha+1)w_f}{2} \text{ with } p_f > 1 \Leftrightarrow w_f > \frac{1}{\alpha+1} = \underline{w_{f2}} \text{ and}$$

$$\pi_{32}^R(w_f) = \lambda \left(\frac{1+\alpha w_f - w_f}{2} \right)^2$$

For Stage 2 of the game, we compare retailer's profits, two to two, and we obtain that:

- whatever w_f , $\pi_1^R(w_f, w_t) > \pi_{32}^R(w_f)$,
- if $w_f < \frac{1-\sqrt{1-(1-\alpha^2\lambda)w_t(2-w_t)}}{1-\alpha^2\lambda}$, $\pi_{31}^R(w_f) > \pi_1^R(w_f, w_t) > \pi_2^R(w_t)$,
- if $\frac{1-\sqrt{1-(1-\alpha^2\lambda)w_t(2-w_t)}}{1-\alpha^2\lambda} < w_f < \frac{w_t}{1-\alpha\lambda}$, $\pi_1^R(w_f, w_t) > \pi_{31}^R(w_f) > \pi_2^R(w_t)$,
- if $\frac{w_t}{1-\alpha\lambda} < w_f < \frac{w_t}{1-\alpha}$, $\pi_1^R(w_f, w_t) > \pi_2^R(w_t) > \pi_{31}^R(w_f)$,
- if $w_f > \frac{w_t}{1-\alpha}$, $\pi_2^R(w_t) > \pi_1^R(w_f, w_t) > \pi_{31}^R(w_f)$.

Thus, the retailer's choice depends on two thresholds of the fair trade product wholesale price,

$$\tilde{w}_f(w_t, \alpha, \lambda) = \frac{1 - \sqrt{1 - (1 - \alpha^2\lambda)w_t(2 - w_t)}}{1 - \alpha^2\lambda} \quad \text{and} \quad \tilde{\tilde{w}}_f(w_t, \alpha) = \frac{w_t}{1 - \alpha}.$$

- (i). If $w_f < \tilde{w}_f$, then the retailer sells only the fair product, at a retail price such as all consumers buy this product (strategy 3 case 1 - (F)).
- (ii). If $\tilde{w}_f < w_f < \tilde{\tilde{w}}_f$, then the retailer sells both products (strategy 1 - (T,F)).
- (iii). If $w_f > \tilde{\tilde{w}}_f$, then the retailer sells only the traditional product (strategy 2 - (T)).

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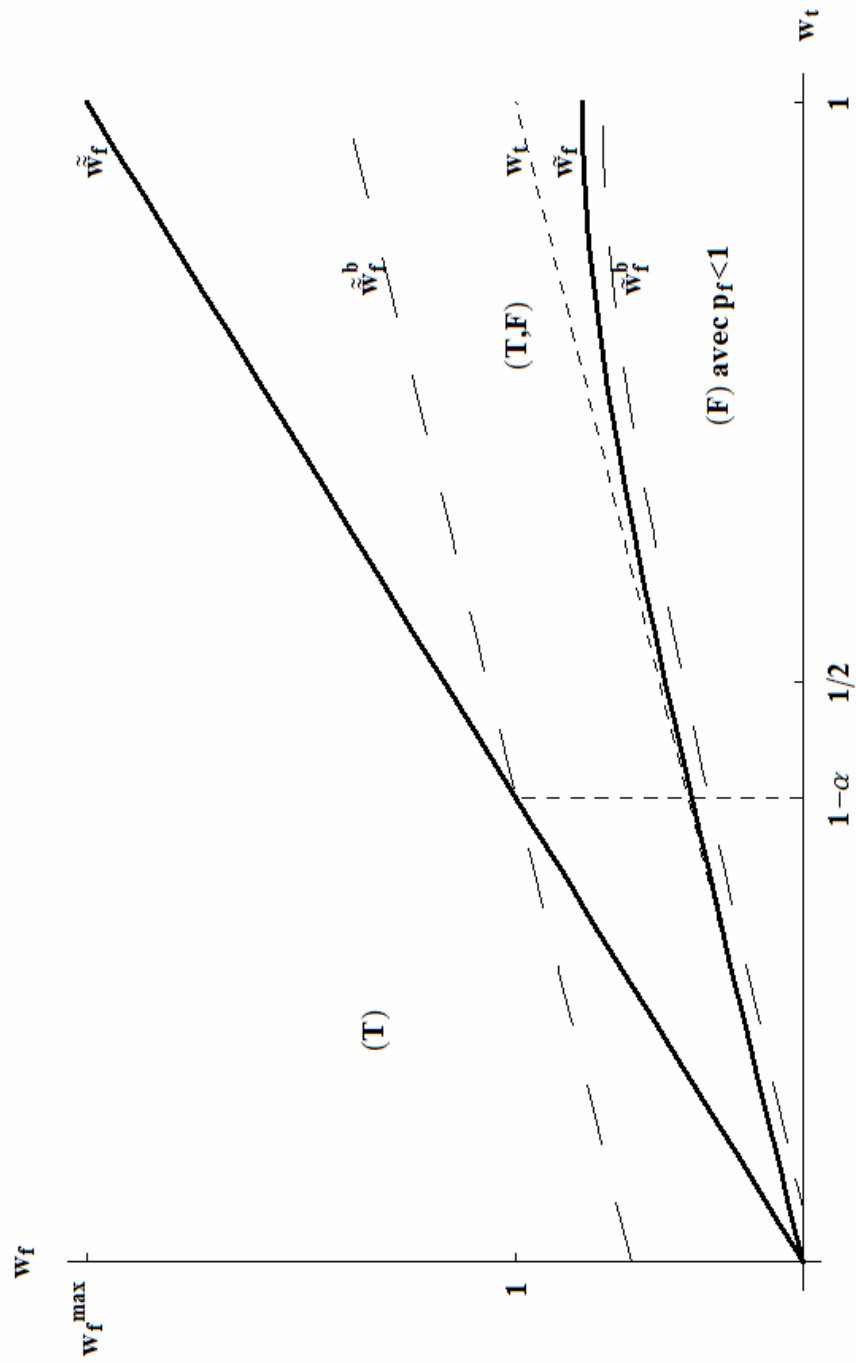


Figure 1: Listing strategies of the retailer

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