

A Quantitative Study On The Fair Trade Coffee Consumer

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ABSTRACT

Few European quantitative studies are available concerning the behavior of ethical consumers. Most of the studies regarding Fair Trade (FT) coffee purchases stick to the consumer perceptions and values. Based on 118,252 French transactions made between 2005 and 2007, this study investigates the impact of personality traits, product characteristics and types of promotions on FT coffee purchases. Regarding the French FT market (third biggest market in the world) and the importance of FT coffee within this market (almost 50% of all sales), the understanding of the French FT coffee consumer helps identify some features of the European FT consumer. This paper examines the link between FT coffee purchases and personal characteristics and the timing of purchase. The results demonstrate that the gender and the age are not related to FT coffee purchases. The promotions have no specific impact on FT coffee but can play a significant role in terms of adoption. Moreover, the FT coffee purchases have a specific seasonality and grow with the educational level and the standard of living.

Keywords: Fair trade, coffee, consumer, France, retail, quantitative analysis

INTRODUCTION

Fair Trade

For two decades, Fair trade was the core business of specialty retailers, social organizations and other cause-conscious consumers. The products were available in very small quantities from a handful of countries. Sales growth was modest and the market remained tiny. In a study published in 2003, D. Giovannucci, a specialist of Fair Trade coffee, wrote that “fair trade coffee [might] have hit a glass ceiling, unable to grow beyond its affinity with a more socially conscious but relatively limited market” (2003). For him, more promotion and distribution in mainstream channels (supermarkets) could rapidly change this situation. But it had “not yet materialized” by that time.

A few years later, things materialized. In 2007, global Fair Trade (now referred to as FT) retail value surpassed €2.3b (FLO, 2007). In a European study jointly carried out by the main international Fair Trade Associations, J.-M. Krier has illustrated this dramatic change in Fair Trade. Sales outlets through supermarkets increased by 32% in 5 years (Krier, 2005) making the annual aggregate net retail value for FT products sold in Europe now exceeding €660m in comparison with €260m five years ago (2005). The average annual increase was about 20% per year. Of the 79,000 points of sale throughout Europe, 55,000 are supermarkets, i.e. almost 70%. The USA and the UK consumers dominated the FT certified product market with more than €700m retail value each. It is no more a “niche market” for socially-aware and middle-class Northern consumers. Not only has FT thus become one of the fastest growing markets in the world, but also Europe has become the biggest market for FT products with an estimated 60 to 70% of all global sales (2005).

Definition of Fair Trade

The Universal Declaration of Human Rights adopted on December 10th, 1948, at the United Nations already proclaimed in its Article 23 (3) “the right to just and favourable remuneration ensuring for oneself and one’s family

an existence worthy of human dignity, and supplemented, if necessary, by other means of social protection”. Nevertheless, even if FT remained a niche market until the end of the past century, the FT actors used to propose different definitions. At the end of the 1990s, there were as many FT definitions as FT actors who competed to be acknowledged as the only and right one. The FT market was tiny as well as segmented.

That is the reason why in 2001 FINE, the informal group made up of the four main international FT associations (namely *FLO*, *IFAT*, *NEWS!* and *EFTA*) united to propose a common definition of FT. “Fair Trade is a trading partnership, based on dialogue, transparency and respect, that 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. Fair Trade organizations (backed by consumers) are engaged actively in supporting producers, awareness raising and in campaigning for changes in the rules and practice of conventional international trade” (Krier, 2005). Its ultimate purpose is thus to make poverty history by maintaining a decent standard of living among small farmers and producers. Although incomplete or too optimistic (Weber, 2007), this definition has been little by little accepted by all major FT actors and scholars since.

Following the examples of the UN and of the FINE, the International Coffee Organization decided to foster the sustainable development of the coffee sector, “leading to enhanced employment and income, and better living standards and working conditions in member countries”. Then, “recognizing the importance of the coffee sector to the livelihood of millions of people, particularly in developing countries”, the ICO included in its International Coffee Agreement this FT dimension (ICO, 2007).

Fair Trade Coffee

Coffee is the world’s second most important export commodity for the developing countries after crude oil (European Coffee Federation, 2006a). As with all agricultural products, climatic conditions and natural disasters have a strong impact on supply. Furthermore, production only reacts to demand with significant delays as it takes three to four years before a new plantation is in full production (ECF, 2006a). Conversely, demand is stable with a global annual increase of 1 to 2% in recent decades. Hence a structurally imbalanced market is leading to recurring problems (ECF, 2006a).

FT has contributed to structurally and dramatically change the coffee world. When FT products appeared in the 1970s, coffee was the first product imported from cooperatives of small farmers in Latin America. More than 30 years later, Fair Trade Coffee generates between 25 to 50% of turnover of all Northern Fair Trade Organizations (EFTA, 2006a). Among the many food products concerned by FT, coffee still continues to be the dominant product worldwide in terms of income and in terms of certification. Besides the crisis of overproduction in 2001-2003 and the emergence of major low cost producers (Brazil and Vietnam), the striking development of demand for FT coffees has forced the coffee actors to develop products for ethical consumption. Nowadays, coffee markets growth potential in Western Europe is limited to FT coffee while traditional coffee growth remains weak. Indeed, FT coffee market shares have dramatically risen: between 1999 and 2004 they increased by 375% in the five European major markets (UK, Switzerland, Austria, Denmark, and Ireland). In 2004, the FT coffee market share reached 20% in UK and 6% in Switzerland (Krier, 2005).

Fair Trade Coffee in France

If public awareness reflects the maturity of the FT market, the French FT market can be said to be mature (IPSOS, 2005, 2006). In comparison with 2000 when 9% of the French public said that they knew about FT (Krier, 2005), this figure skyrocketed, reaching 79% in March 2006 (Max Havelaar, 2006b). Max Havelaar France is the main player of the attribution of FT labels in this sector (Conseil de la Concurrence, 2006). Considering sales and FT market share, we can observe a crossed evolution in France. On the one hand, within FT products, FT coffee market share has decreased: it represented 58% of FT retail value in 2004 (Palma Torres, 2006) but it only represented 46% in 2006 (Max Havelaar, 2006b). On the other hand, more and more FT coffee is sold. In 2004, the FT coffee retail value was €40.6m (58% of €70m for certified products) whereas it was €76.36m in 2006 (46% of €166m for certified products (Max Havelaar, 2006b)). This crossed evolution reflects the boom in Fair Trade retail

value: more and more certified products are sold and if coffee remains the number one FT commodity, new products (cotton and tea) have joined the market.

The French FT coffee market may not have the maturity of the UK market (20% of market share). Moreover, France may only be the sixth global market as regards coffee consumption (Xerfi, 2007)¹. Nevertheless French FT coffee is interesting for many reasons. Firstly, it is the leading FT market in continental Europe (FLO, 2007). France with less than a third of the retail value (€210m) of the UK FT market was in 2007 the third biggest global market in FT certified products. Even if FT labeling has been slower to take off in France, since 1998, things have been moving very quickly: the French market in FT certified products grew by more than 70% over the last 3 years. Secondly, French FT coffee has the second highest market share in continental Europe. Before 2000, FT coffee had a market share of 0.1% in France (Krier, 2005). In 2006 the market share was around 5% (Conseil de la Concurrence, 2006), FT Arabica coffee² representing 7% of sales volume and 8% of sales revenue (Max Havelaar, 2006b). Thirdly, it is the main European market offering coffees of pure origin, responding to the awareness of consumers about the concepts of soil and origin, the ‘*terroir*’ (ECF, 2006b).

As Sanches (2005) observed, French political and economic culture is characterized by dependence on a powerful and centralized state. It makes the regulation of government critical to FT sales (Ozcaglar-Toulouse, 2006). That is why the French government has standardized FT so as to clarify a whole industry which became complex to understand (many labels, different actors). The process of French FT regulation started in 2005 when a law was passed by the Parliament to organize, clarify and certify Fair Trade (Law n° 2005-882 for SMEs, August 2, 2005; decree JORF n°113, text n°281, May 16, 2007). Then in 2006, the French Standards Association (AFNOR) developed with the main FT actors (NGO, retailers, consumers, importers) the reference systems as regards FT in France (Agreement AC X50-340)³.

Plan of the paper

For all of the reasons mentioned above, this paper aims to study FT coffee consumption in France. First, the paper commences with a review of the literature regarding FT and its history. The previous studies concerning FT coffee in Europe will also be examined. Second, the aim and objectives of the study are developed. Third the methodology used for the quantitative analysis is presented. Fourth, the results and the implications of the study are discussed.

I – LITERATURE REVIEW OF FT

History of FT

Ethical consumption appeared many decades before the 1970s. In the first half of the XIXth century, a group of opponents to slavery opened “free produce” stores that sold only items grown and manufactured by non-slaves (Glickman, 2004). Consumer activism was quite developed in the US by that time: it concerned abolitionists as well as non-abolitionists or just conservative Christians (2004). In 1860, a Dutch writer, E. Douwes Dekker, also known as Multatuli, reflected this activism in Europe by publishing the well-known *Max Havelaar* (“*Max Havelaar Of de koffiveilingen der Nederlandsche Handelsmaatschappij*”) to fully expose the abuse of free labour in the Dutch Indies. Then, around the beginning of the XXth century, many buyers’ associations were created (mainly by women) in Europe and in the US. The American *National Consumers’ League* (1899⁴), the French “*Ligues sociales*

¹ The USA (20.2m bags), Brazil (15.9m), Germany (9.2m), Japan (7.3m), Italy (5.6m) and France (5.3m).

² By 2002 approximately 50% of the market was *arabica* while 50% was *robusta* (Giovannucci, 2003).

³ For instance, it has imposed that the minimum prices and criteria recognized by FT International federations be explicitly mentioned in the bill of the SMEs (Poret, 2007).

⁴ Organizations designed to promote better conditions among workers by encouraging the purchase of articles made and sold under improved working conditions. The movement started in England (1890); the U.S. group was founded (1899) by Florence Kelley and her followers. The League undertook to investigate factories and to educate consumers in purchasing habits. For many years the League used a label for goods which had passed inspection, and many consumers learned to purchase only those goods

d'acheteurs" (1902), the German "*Käuferbund*" (1907) and many other European associations (Chessel, 2003 & 2004) were all engaged in acts of ethical consumption. Each act of consumption was regarded as linked to each act of production, everybody being responsible for the well being of producers by their consumption choices (de Ferran, 2007).

The two World Wars and the wave of decolonization after 1945 did not allow those small but active social Leagues to expand. Nevertheless, new structures appeared. In 1946, the American *Ten Thousand Villages* (formerly *Self Help Crafts*) began buying needlework from Puerto Rico, leading the way to the first formal "Fair Trade" shop in 1958. By that time, *Oxfam UK* started to sell craft products made by Chinese refugees. Then in 1964 it created the first FT Organization (EFTA, 2006a).

It was only in 1973 that *Fair Trade Original* in the Netherlands, imported the first "fairly traded" coffee from cooperatives of small farmers in Guatemala (EFTA, 2006a). Since then, FT has slowly expanded. Exclusively sold in Specialized Stores (SS) for two decades, the FT market grew suddenly at the end of the 1990s when it started to use more conventional distribution channels: supermarkets. From then on, international FT sales have been growing by more than 20% every year (Krier, 2005).

In France, the Max Havelaar label was introduced in 1992 in one region, Brittany, and it remained promoted only there until 1997 (Giovannucci, 2003). Then, diverse FT participants formed a new FT platform to promote the label nationally. The FT movement was still less developed than it was in Germany, Belgium or the UK, but it quickly caught up. From less than 1% per year before, French consumption grew by more than 250% between 1999 and 2001 – the greatest FT growth (2003). Similarly, the FT coffee market grew at the highest rate of all the EU countries. FT was no longer the monopoly of specialized stores: in 2003, 71% of sustainable coffee was sold in mainstream market channels whereas specialty shops market share was expected to decline (2003).

Government regulation has underlined the importance of labels in the French food industry whether they be FT or not (e.g. "A.O.C.", whose translation can be "controlled term of origin"). Specialized stores do not sell labeled products owing to the fact they are devoted to FT, whereas, hyper and supermarkets (SM) only sell labeled products (de Ferran, 2007). It implies the importance of selling through conventional distribution networks in France. According to Max Havelaar France, 80% of all FT products are sold in supermarkets; only 15% are sold in Specialized Stores (Max Havelaar, 2006b). SM may be a symbol of the consumer society and free trade (Baudrillard, 1998), it has also become the best channel for fair trade to develop. In 2005 there were 165 *worldshops* in France which generated €9.3m and 10,000 supermarkets selling FT products. The retail value of labeling organizations was €69m (Krier, 2005). Furthermore those channels have hugely benefited from some important innovations implemented over the past years. France is today one of the main European markets for espresso machines with single-serve portions which has seen an exponential growth. Moreover, products for easy home preparation as well as new recipes have been developed for bars and brasseries (European Coffee Federation, 2006b). For those reasons, the FT coffee market share sold in SS is expected to become less and less important in the years to come.

Previous studies regarding FT products

Considering the upsurge of the European FT market since the beginning of the new millennium, most of the studies made on the FT market before 2001 are no longer relevant. Davies (2007) identified the niche-market era before 2002 and the "mass-market era of fair trade" since 2002. Recently, some studies did try to analyze FT consumption in Europe. De Pelsmacker et alii (2006) for the Belgium market, Maietta (2004) and Becchetti & Rosati (2007) for the Italian market, Tanner and Wölfling Kast (2003) for the Swiss Market, Llopis Goig (2007) for the Spanish market, de Ferran (2007) and Ozcaglar-Toulouse (2006) for the French Market proposed studies mostly based on questionnaires (limited to 1,000 people) or on convenience samples (qualitative approach). They focused on the consumer perceptions and values to highlight decision-making as regards ethical consumption. Schaw and

thus labeled. Many of the objectives of the League became law, e.g., shorter hours, minimum wages, payment for overtime, and the abolition of child labor in most states. *The Columbia Encyclopedia*, 6th Edition, 2004, Columbia University Press.

Shiu (2003) tried to develop a model of ethical consumer decision-making to explain the intentions of purchases of FT grocery products.

Many studies have highlighted café culture and lifestyle statements in different countries, e.g. in Scotland (Scott, 2006). Concerning FT coffee particularly in Europe, the largest study was carried out in 2003 by Giovanucci and Koekoek for the ICO, the UNCTAD (United Nations Conference on Trade and Development), the IISD (International Institute for Sustainable Development) and the World Bank. Nevertheless it dealt with data from 2001 when FT coffee was still a niche market. By then, the French FT coffee market share was 0.35% (Giovanucci, 2003) and it was expected to reach 1% in 2004. It actually attained 5% in 2006 (Max Havelaar France, 2006a; Conseil de la concurrence, 2006). Since Giovanucci, few scholars have studied FT coffee. In a survey of 808 Belgian respondents, De Pelsmacker (2005a) found that consumers' buying behavior was not consistent with their positive attitude toward ethical products. Concerning the French market, de Ferran (2004, 2007) found that the retail stores chosen (SM or SS) have to be taken into account to implement efficient marketing strategies because of different purchasing motives in the two locations.

As regards FT consumers, several studies did try to identify the ethical consumer in terms of demographic characteristics. Most concluded that demographics were not relevant in identifying the socially responsible consumer: neither the basic demographic characteristics (age, income and employment status), nor the gender seem to influence ethical buying behavior (Tsalikis and Ortiz-Buonafina, 1990; Sikula and Costa, 1994; Roberts, 1995; MORI, 2000; Dickson, 2001). Anyway, while FT consumers support FT values, their "product purchase does not appear to be viewed as an altruistic act because purchasers are unwilling to sacrifice product quality for the sake of purchasing" (Littrell and Dickson, 1999). Fair Trade is not a charity business.

Almost all of the previous demographic research has been done during the "niche market era" (1990-2002). Since the beginning of the "mass-market era of FT", new studies have been carried out. In a web-based survey on a sample of 750 Belgian coffee consumers, de Pelsmacker *et alii* (2005a, 2005b) confirmed that demographic characteristics did not appear to have a substantial impact on ethical product buying behavior. Only the importance of the label issuer discriminated between socio-demographic groups (older and less educated consumers attached more importance to it than other groups). Based on a US sample of 1,474 older consumers, Moschis, Curasi and Bellenger (2004) showed that even if the older market can best be described as composed of four gerontological segments (healthy hermits, healthy indulgers, ailing outgoers and frail recluses), FT was not considered as a reason for patronizing specific food and grocery stores in any of those segments. As older consumers spend about 10 percent more on food than the US average, they remain very price-conscious. Furthermore location (the location of the stores and the ease of locating merchandise within the store) is still the number one criteria. Nevertheless other studies insisted on the sense of moral responsibility of mature senior consumers (Carrigan, Szmigin and Wright, 2004). Through a printed questionnaire distributed to 1,055 respondents of four North American FT businesses, Littrell, Jin Ma and Halepete (2005) studied the differences in product attitudes between generational cohorts of FT apparel consumers, *i.e.* generation X (ages 29-40), baby boomer (ages 41-59) and "swing" (ages 60-75). All groups strongly supported the FT ideology. They "did not shop in different ways nor did they differ in their retail venue preferences". However the research suggested that generation X participants were more attracted by fashionable attire whereas baby boomers and swing participants looked for clothing comfort, value and quality.

Nonetheless, based on 1,012 phone interviews, a recent French FT survey (Ipsos-PFCE-MAEE-GRET, 2008) showed that ethical consumption in France depended on education and income. More than 60% of the consumers with a bachelor degree and 60% of higher incomes had bought a FT product during the last month while only 36% of the interviewed people had done so. As for demographic characteristics, young people (less than 35 years old) were more concerned (74% of them had bought FT products) whereas only 53% of consumers aged over 35 had bought FT products. Coffee was the most favored FT commodity (81%) in comparison with rice/corn (48%) and tea (34%).

Finally, considering FT coffee purchases in Europe, there is a real scarcity of research. Based on the purchase data of Italian supermarkets and shopping centres between 1998 and 2002, Maietta (2004) conducted the largest quantitative study. She observed 3,669 purchases and tried to find the hedonic price of FT coffee at a time when FT coffee was still a "niche product". No study has been conducted in France to analyze FT coffee purchases.

It means that in most European countries no quantitative study is available about the actions of so-called ethical consumers. Ethical consumption has not been measured and tested. With the exception of Maietta, most of the studies regarding FT coffee purchases stick to the consumer perceptions and values whereas no strong correlation has been yet proved between attitudes and buyer behavior, especially in the social marketing area (Shaw and Clarke, 1999; Kotler, 2001; Nicholls, 2006; Chatzidakis, 2007). Price, brand familiarity and quality remain the most important factors affecting the buying decision (CRC-Consommation, 1998; Carrigan and Boulstridge, 2000; Carrigan and Attalla, 2001; Tallontire, Rentsendorj and Blowfield, 2001; de Pelsmacker, 2005a, 2005b & 2006). In France, 93% of FT purchases are made in super and hypermarkets (Ipos PFCE-MAEE-GRET, 2008).

II – AIMS AND OBJECTIVES OF THE STUDY/RESEARCH GOALS

The study seeks to remedy such deficiencies in order to overcome the attitude-behavior gap when people give socially desirable answers (Shaw & Shiu, 2002; de Pelsmacker, 2005a, 2005b). More specifically, it makes two main hypotheses around the purchase motivation of FT coffee.

First, past qualitative studies show a link between personal characteristics and FT coffee purchases: gender, profession, income and so on. The FT coffee purchase seems to be closely related to demographic factors (gender, profession, age). The consumption increases with the educational level and the standard of living. Moreover, women seem to be more concerned with FT (Sikula & Costa, 1994; Tsalikis & Ortiz-Buenafina, 1990).

H1: FT coffee purchases are related to demographic factors.

H1a: FT coffee purchases increase with the educational level and the standard of living. These two aspects are here summarized by the profession of the customer.

H1b: younger consumers are more socially conscious.

H1c: women are more socially conscious.

Second, this paper studies the purchase timing between two aspects: the seasonality and the impact of promotions. There are crucial considerations here. If the purchase seasonality of traditional and FT coffees is not comparable, it would indicate specific motivations for FT coffee. The role of the promotion more generally represents the impact of marketing for this type of product. If the motivations are different, the impact of different types of promotions must be specific.

H2: the consumption logics of FT coffee and traditional coffee are not the same.

H2a: the consumption seasonality is not identical.

H2b: the impact of the promotions is specific depending on the coffee type.

Furthermore, regarding the French FT market (third biggest market in the world with a turnover of €220m) and the importance of FT coffee within it (almost 50% of all sales in 2006), the ultimate objective is to help identify some features of the FT consumer from the French FT coffee consumer.

III – METHODOLOGY

Data

The analysis is based on panel data from *BehaviorScan* in the retailing sector. This panel represents 5,668 households who purchased coffee at least one time in the supermarket or in a hard discount store between January 2005 and June 2007. Customers' personal characteristics (including possession of loyalty cards) are available. The transactions and the products are described (time of the transaction, products purchased and their characteristics, amount and quantity involved...). Moreover, the promotions are tracked: aisle-end displays, handbills and

animations in the shop. There are globally 118,252 transactions with, at least, one coffee bag purchased and 152,633 folded-over coffee bags purchased (from which 10,267 FT coffee bags). The decision to purchase FT coffee depends on personal characteristics as well as on the purchase context (price, promotions...). Finally, our analysis is focused on the quantity of FT coffee bags purchased at a disaggregated level (for each transaction).

Model

The transactions occur in a “non contractual” setting. In the case of “non contractual” relationships, customers do not notify the firm when they disappear (Dwyer, 1989; Jackson, 1985). There are two possible model specifications to take into account for our type of transactions.

First, it is possible to treat them with continuous mixture models (for example Pareto/NBD or BG/NBD models). In fact, the transactions in a “non contractual” setting are treated more and more with continuous mixture models. However, despite their increased popularity, their managerial implications are limited due to the parametric distributions of the parameters and the lack of explanatory variables. If generalizations are always possible, however they are very complex (Casteran, Meyer-Waarden, & Benavent, 2007).

The second option is the finite mixture models. They have been used for more than 100 years (Newcomb, 1886; Pearson, 1894). The finite mixture models offer a very accurate explanatory pattern due to segmentation and explanatory variables. Moreover, they permit to adopt a semi-parametric point of view. Indeed, they suppose the existence of classes in population and, in each of those classes, they suppose a link in each class between the dependent variable and the independent variables. The main advantage of this formulation is its clear managerial implications.

This formulation gives an intuitive comprehension of heterogeneity by a limited number of classes. But this formulation remains rigorous. Laird (1978) and Heckman and Singer (1984) show that a finite mixture model gives a good numerical approximation of the underlying distribution. It works even if the distribution is continuous. Each component of the mixture density is a local approximation of this distribution. This approach is a serious alternative to a purely non-parametric estimation. However, despite these properties, the applications in marketing are quite recent (Wedel et alii, 1993).

The number of products purchased y at each transaction is supposed to be Poisson distributed with a frequency parameter λ . λ is varying across an underlying distribution on the population. This distribution is supposed to be discrete (latent class), which leads to a finite mixture formulation.

C unknown latent classes are supposed to exist; each individual is supposed to belong to a single class. Of course,

this membership is not directly observed. The prior probability of membership to a class c is π_c with $\sum_{c=1}^C \pi_c = 1$.

Moreover, the data are longitudinal. It means that there are N_i transactions for I individuals with $\sum_{i=1}^I N_i = N$. For

each class c , individual i and purchase n , the following expression is:

$$P(y_{in} | \lambda_{in|c}) = \frac{e^{-\lambda_{in|c}} \lambda_{in|c}^{y_{in}}}{y_{in}!} \tag{1}$$

y_i is the number of products purchased at each transaction and $\lambda_{i|c}$ the frequency parameter for the customer i conditionally to the membership of the class c . Of course, some explanatory variables x_1 and x_2 can be incorporated. $\lambda_{i|c}$ is now:

$$\lambda_{in|c} = \beta_{0c} \exp(\beta_{1c} x_1) \tag{2}$$

with the constant β_{0c} . The prior probability of membership to a class c is expressed through a multinomial logit form:

$$\pi_c(x_2, \beta_{2c}) = \frac{\exp(k_c + \beta_{2c}x_2)}{\sum_{j=1}^C \exp(k_j + \beta_{2j}x_2)} \text{ with } k_j \text{ constant.} \tag{3}$$

The density is then, with Θ the vector of the parameters:

$$f(y_{in} | x_{1in}, x_{2in}, \Theta) = \sum_{c=1}^C \pi_c(x_{2in}, \beta_{2c}) \mathcal{P}(y_{in} | \lambda_{in|c}(x_{1in})) \tag{4}$$

The parameters are estimated by the maximization of the log-likelihood.

$$LL = \sum_{i=1}^I \sum_{n=1}^{N_i} \log [f(y_{in} | x_{1in}, x_{2in}, \Theta)] = \sum_{i=1}^I \sum_{n=1}^N \log \left[\sum_{c=1}^C \pi_c(x_2, \beta_{2c}) \mathcal{P}(y_{in} | \lambda_{in|c}(x_{1in})) \right] \tag{5}$$

The iterative EM algorithm (Dempster, Laird and Rubin, 1977) is used. The optimal number of classes is determined by the comparison between models using Akaike Information Criterion (AIC) (Oliveira-Brochado and Martins, 2005).

$$AIC = -2LL + 2k \tag{6}$$

with k the number of parameters to estimate.

The posterior probabilities for a customer i to belong to a class c are:

$$P(c|i) = \frac{\pi_c \prod_{n=1}^{N_i} \mathcal{P}(y_{in} | \lambda_c(x_{1in}))}{\sum_{j=1}^C \pi_j \prod_{i=1}^{N_i} \mathcal{P}(y_{in} | \lambda_j(x_{1in}))} \tag{7}$$

Of course, one of these formulations (mean of products purchased and prior probabilities) or both could be purely stochastic with only constant terms. It implies: $\lambda_{in|c} = \beta_{0c}$ and $\pi_c = \frac{\exp(k_c)}{\sum_{j=1}^C \exp(k_j)}$.

Estimation steps

The procedure is divided into two steps. In the first step, the number of classes for FT coffee purchases is iteratively estimated. The selection of the number of classes is based on the AIC. The coefficients are estimated for FT coffee purchases. In the second step, the same number of classes used to estimate the traditional coffee purchases is kept. The estimated coefficients for FT coffee and traditional coffee are then compared.

IV – RESULTS

Estimation

Due to the limited number of pages, the details of the coefficients values can't be given here. Of course, they are available if required. With respect to the AIC, no explanatory variable in the multinomial model is incorporated. The prior probability formulations are then based only on constant terms. For the same reason (AIC value at 11,591.98), the optimal number of classes is three. Another way to assess the validity of the models is the rootogram (based on the root square of countings) of posterior probabilities.

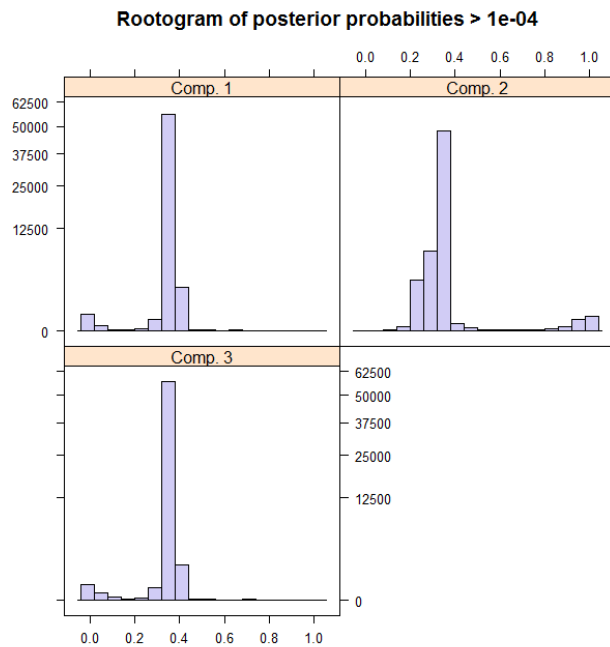


Figure 1: Rootogram for FT coffee purchases

They represent the distribution of posterior class probabilities. A peak at probability 1 is the more interesting result because it indicates a clear-cut between the segments. However, there is a concentration in the middle of the intervals indicating an overlapping between segments. In other words, people are likely to belong to one class or to another one. The borders between segments are not very clear in the case of FT coffee consumption. Logically, the results are also poor for traditional coffee. The misspecifications are the same.

These results can have two causes: either the lack of appropriate explanatory variables or the sign of an immature market without clear behaviors. However, the variables seem to be very accurate: demographic characteristics, marketing variables and so on. An immature market is characterized by a large number of versatile customers with no fixed preferences for one type of product.

Class details

The classes depend, of course, on the number of FT coffee bags purchased at each transaction. The distribution indicates that there are three behaviors: non-customers making exceptional purchases, heavy customers making specific purchases and heavy purchasers (figure 2).

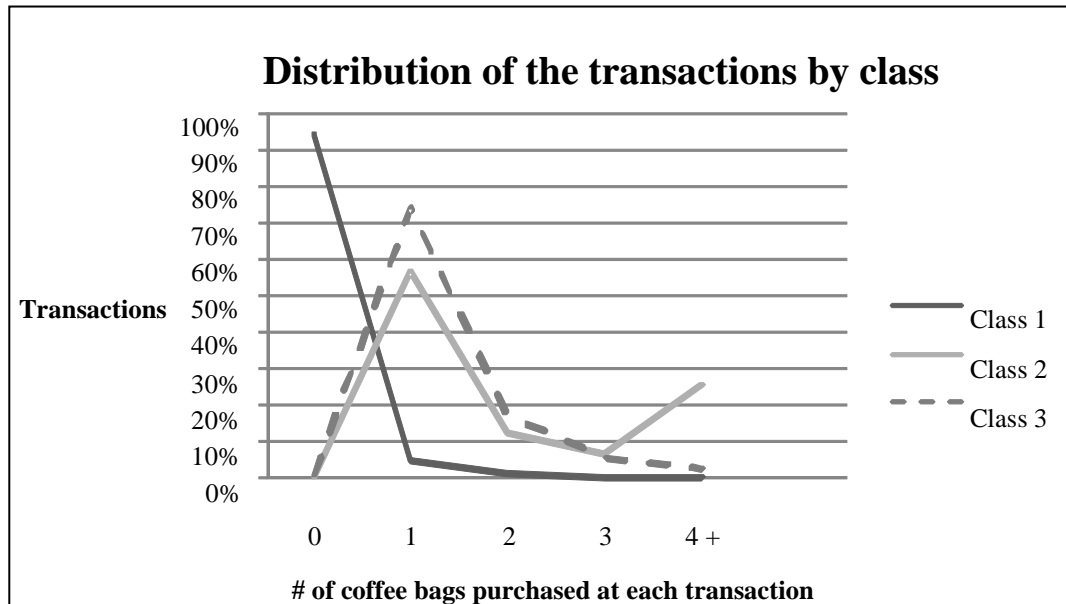


Figure 2: Distribution of the transactions

Those classes are well-characterized:

Table 1

	Size	Part of FT coffee purchases	Well-off professions	Lower wages	Non-working (unemployed and retired)	Unitary price of purchased bag
Class 1	93.5%	46.0%	36.3%	31.6%	32.1%	2.85 €
Class 2	0.5%	4.4%	62.5%	31.3%	6.3%	3.54 €
Class 3	6.0%	49.6%	62.8%	11.6%	25.6%	2.70 €
Total	100.0%	100.0%				

The size of the classes is very dissimilar (table 1). Class 2 is almost negligible except for its part in the FT coffee purchase. But the largest amount of purchases is generated by class 3. The behavior of this class is clearly opportunistic with the lowest unitary price: “I buy if it’s cheap”. By opposition, class 2 is composed of “FT coffee fanatics” with a large consumption of expensive products.

For the good understanding and to reference to FT purchases, class 1 will be called “non-purchaser”, class 2 “heavy purchaser” and class 3 “opportunistic purchaser”. These terms are a bit misleading: for example, non-purchasers represent almost half of FT coffee sales due to their importance in the population.

Coefficients

The values of the coefficients illustrate the behavioral fundamentals in the choice of coffee. They allow us to validate the hypothesis. In two classes (non purchasers and opportunistic purchasers), the profession coefficients are significantly different from zero. The logic is quite different depending on each class. For non-purchasers, the well-off profession is positively correlated with the FT coffee purchases. For opportunistic consumers, all the professions, by contrast with farmers, are positively correlated with the FT coffee purchases. Given these results and the specific distribution of professions by class, hypothesis 1a is accepted.

The role of age is more ambiguous. On the whole age has no impact on purchases except for non-purchasers where people aged over 70 have a slight higher probability of consuming FT coffee. However, this

correlation is likely to reflect the income level. Therefore hypothesis *1b* is rejected. Despite the results of previous qualitative research, there is no significant link between gender and FT interest. The coefficients for male purchases (in contrast with female behaviors) are not significant (not different from zero) in any class. Hypothesis *1c* is rejected as well.

Finally, FT coffee purchase is related to demographic factors in the terms of income and culture. Despite the restrictions on gender and age, hypothesis 1 is validated. Considering the result for traditional coffee, the class by class comparison of seasonality offers no clear results. The coefficients are not significant at class level. However, the comparison at an aggregated level is instructive:

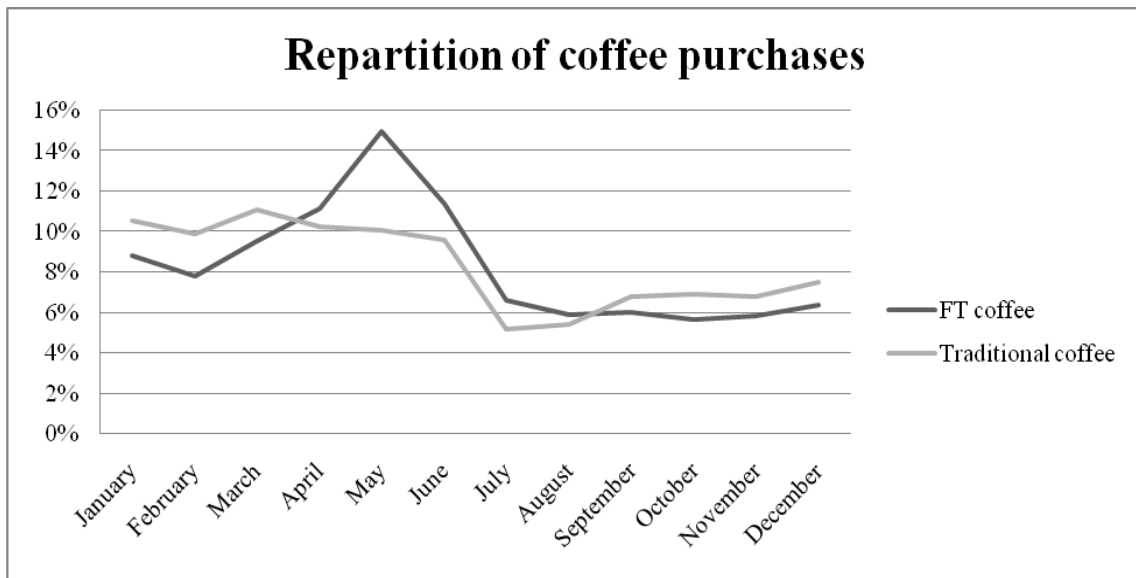


Figure 3: Distribution of coffee purchases

Clearly, there is a consumption peak for FT coffee in a three-month period (from April to June in figure 3). It surely corresponds to the Fair Trade “fifteen days” event (“*quinzaine du commerce équitable*”¹) which has been organized in France since 2000 by FT actors in May. This three-month period corresponds to the pre-promotion and the post-promotion impact. At the same time, traditional coffee consumption is stable, even regressing. Seasonality is not the same, which validates hypothesis *2a*. At the same time, it seems difficult to detect significant differences between promotion coefficients. The promotions have the same type of impact on coffee consumption; their amplitude is not significantly different. Hypothesis *2b* is rejected. Globally, hypothesis 2 cannot be confirmed nor rejected: seasonality is different but only at an aggregated level and promotions do not have a dissimilar impact.

This seasonality however is specific for each class. The “fifteen days” event has a different impact on each class. So, May represents 9% of the sales generated by the heavy-purchaser class. This volume is close to a standard value for a given month ($100\%/12 = 8.3\%$). The promotion has almost no impact on the consumption of this class. The result is very different for the other classes since May represents 16.4% of the sales of the “non-purchasers” and 13.3% of the “opportunistic” purchasers.

V - DISCUSSION AND IMPLICATIONS

This paper qualifies the results of previous qualitative researches. It develops managerial implications for FT coffee actors (academics, NGOs, manufacturers and retailers) based on a quantitative approach. As it focuses on

¹ See the website: <http://www.quinzaine-commerce-equitable.fr/>

the major FT product, i.e. coffee, the implications could be relevant for the whole FT market.

First, the French FT coffee market is a three sided market, which can represent a three-step lifecycle: non-consumers, opportunistic consumers and heavy purchasers. Promotions could have a central role on the class of opportunistic purchasers. By permitting a first purchase and, afterwards, repeated purchases, they could contribute to a class change, from the opportunistic to the heavy purchaser. The heavy purchaser class is made up of a majority of well-off professions. These classes are a major target for the development of FT products. Advertising and communication should target primarily the well-off professions. First, these professions are well-educated and probably more sensible to the ins and outs of FT. Second, their income makes it easier for them to accept the price difference existing in France between FT and traditional products. This consideration is especially interesting given the permeability of the classes. The taking into account of the posterior probabilities is clear with the overlap of the classes. The majority of customers are able to switch easily from one class to another.

Second, FT coffee sales seasonality is obviously strong. In France, they hugely depend on the FT fifteen days event, "*la quinzaine du commerce équitable*". During the three months (April, May and June) around this FT event, about 38% of all FT yearly sales are made. It clearly implies that, until now, French FT consumers have not adopted a FT behavior during the whole year. Here there are two options for FT firms that would like to increase their sales in France. Either they can focus on this FT event through massive communication campaigns and partnerships with local dealers and FT actors (their aim could be to extend the FT event to a month period), or they could create another FT event during the second part of the year between October and November. Doing so, it could generate more growth and expand FT commitment across "heavy" and "opportunistic" consumers throughout the year. In any case, French FT consumer are sensitive to massive advertising and promotion campaigns. As we saw, the non purchasers and the opportunistic purchasers are especially sensible to promotions. Promotions appear to be an efficient tool for generating a class switch to the heavy-purchaser class.

However we can doubt the sustainability of this switch. Indeed, the non-working people represent between a quarter and a third of the members of these classes whereas they only represent 6.3% of the "heavy" purchasers. The underlying question is the relative importance of the price level in the choice process. If the price level has a high importance, then the changes are limited to the promotion period. In the opposite case, the switch is more sustainable and linked to a real involvement. The duration of the post-promotion impact (globally from June to August) could mean a sustainable switch to an increased consumption. This result confirms the central place of advertising for FT products. But further work is required to definitely validate the promotion impact.

Third, as seen before, the link between attitudes to FT coffee and demographic characteristics is partially validated. FT consumption is not female consumerist activism as it once was believed. In the same way, young people are no more sensitive to FT issues than older people. In fact, the largest factor is the social position, expressed by the culture and the income of consumers. As long as FT coffee remains more expensive than traditional coffee, this overrepresentation of well-off professions can last for a while. But one can assume that if the prices become the same for both products (as it is in the UK), FT coffee would increase its market share and would be increasing purchased by lower wages and non working people. The price could have a central role in two steps. The first step is the switch from the non-purchaser class to the opportunistic class motivated by a lower price. The second step could be, through the reinforcement (or through the inertia), the switch from the opportunistic class to the heavy-purchaser class. But caution should be taken in the use of price promotion. It supposes a price promotion period that is long enough to induce behavioral changes but not too long to avoid a significant reduction of reference prices.

Nevertheless, this research needs further analysis. The first step could be work on the behavioral characteristics of FT coffee and traditional coffee purchases. For example, does the FT characteristic increase the loyalty to the brand? The second could deal with the probabilities of switching from one class to another. This measure could assess the permeability of the classes and the precise impact of price. And the third one could measure the impact of the FT factor on the future behavior of the consumer as regards brand loyalty. The implications are potentially very large for valuing the FT characteristic from a brand point of view.

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