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Cognitive Dissonance and Customer Allegiance in a Mixed Oligopoly

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Abstract

The purpose of this article is to examine the effect of cognitive dissonance in a mixed oligopoly where a local cooperative competes with an investor-owned firm (IOF) for the local market. The article explicitly incorporates individuals' beliefs regarding the quality of the two organizations as a choice variable in the utility function and individuals trade off utility from beliefs against utility resulting from their actions. The proposed model considers a case where managerial decisions or the introduction of new products forces consumers to modify their initial beliefs regarding the (superior) quality of their cooperative. Analytical results demonstrate the changes in equilibrium that result from cognitive dissonance.

Key words: cooperatives, cognitive dissonance, mixed oligopoly.

Over the last years substantial structural changes in the agricultural sector gave rise to a more challenging economic environment that is characterized by tougher competition, stringent consumer demands and economic liberalization. These challenges, combined with a declining member commitment and poor strategic decisions, helped undermine some of the most prominent North American agricultural cooperatives; some of them filed for bankruptcy protection, some ceased operations while others were transformed to for-profit firms. Well-known examples include AgWay (Anderson and Henehan 2002; Fairbairn 2003) and Tri-Valley Growers (Sexton and Hariyoga 2004) in the US, and the Saskatchewan Wheat Pool (Lang and Fulton 2004) in Canada.

The recent decline of agricultural cooperatives highlights the relationship between a co-op and its local community, since it is the commitment of their members that effectively differentiates co-ops from other organizational forms and enables them to successfully compete in the marketplace (Fulton 1999; Fulton and Giannakas 2001). Changes in consumers' beliefs regarding the role of cooperatives and their contribution, especially with respect to local communities, can affect members' commitment and thus co-op's market share.

The purpose of this article is to provide further insights into the relationship between a cooperative and its local community and offer a new approach to understanding the

dramatic decline in market share that many US and Canadian cooperatives have suffered over the recent years, a decline which can be at least partially attributed to declining member commitment. Specifically, the objective of this article is to explore how changes in the economic environment can influence consumers' beliefs regarding a local co-op and hence their buying behavior. The article considers the case of a mixed oligopoly where a local cooperative competes with an investor-owned firm (IOF) for the market. Poor managerial decisions from the co-op generate new cognitions for the consumers in a local community that have to choose to either patronize the local co-op or an IOF. Previous cognitions regarding the roles of the two organizations are now revised and consumers modify their buying behaviors accordingly. Cognitive dissonance can play a critical role in this setting, since consumers need to consider both pecuniary and non-pecuniary elements that affect their overall utility.

Consumers, either from ideology or from pragmatism, form a set of beliefs regarding the organization they choose to patronize. In the case of cooperatives, many co-op members are highly committed to their organization; they believe that the co-op is operating in their best interests and therefore they attribute higher quality to its product (Fulton and Giannakas 2001, 2006). Others perceive the co-op as an organization that enhances their local economy and therefore a crucial institution for their community (Merrett and Walzer 2003). However, not everybody shares the same beliefs on the positive role of cooperatives and some do not even consider them as being different from any other business. In any case, these beliefs are not impervious to changes in the economic environment, but instead adjust over time in ways that are useful for the consumer.

Changes in the economic environment, including managerial decisions, introduction of new products or services, and changes in prices or quality, will create new beliefs or cognitions for the consumer. Consider first a case where the co-op's board undertakes

consecutive poor managerial decisions. This might create doubts by its members regarding the extent to which their cooperative is operating in their best interests and therefore have a negative effect on the perceived quality of the co-op product (Fulton Giannakas 2001, 2006). Similarly, new investments from the IOF that result in products of relatively higher quality will change individuals' cognitions regarding the quality of the IOF relative to the co-op. In both cases the individual consumer receives new information that makes her review previously held beliefs regarding the qualities of the two organizations. The assumption that consumers initially perceive their co-op as offering a product of higher quality relative to the IOF implies that there will be a discrepancy between their initial set of beliefs and the new informational signal. Therefore, consumers will have to deal with contradictory cognitions, where their initial belief on the higher quality of the local co-op is contrasted with self-interest, or undertake actions that do not agree with previous held beliefs by switching their business to the IOF. This situation gives rise to the discomforting feeling of cognitive dissonance – a situation where the individual holds contradictory cognitions or when actions and beliefs do not agree. In our article the source of cognitive dissonance is something that happens in the market that decreases the perceived quality of the co-op product. This change can be related to managerial decisions, introduction of new products, or new offerings that upgrade the perceived quality of the IOF. The quality of the IOF as an organization is considered to be high when, *ceteris paribus*, the consumers purchasing from the IOF believe that IOF is a superior organization compared to the local co-op – i.e., they have low valuation for the co-op. Alternatively the IOF's quality is considered to be low when consumers believe that the co-op is operating on their best interests. However, switching from the co-op to the IOF creates cognitive dissonance since the consumer has to recognize the fact that the IOF is better than the co-op, which contradicts with her initial belief.

The starting point of the model developed in this article is that consumers are heterogeneous in a number of ways, including their beliefs regarding the quality of the two organizations. A modified rational-choice model for decision-making is employed where consumers are assumed to have preferences over their beliefs and are partially able to choose the belief that maximizes their utility. However, cognitive dissonance creates added costs that affect consumers' perceived utility and their buying decisions.

The article is structured as follows. The next section introduces the main concepts regarding cognitive dissonance and briefly discusses some of its main applications in economic literature. Next, a simple theoretical model of mixed oligopoly is presented where consumers differ in their attitudes towards the co-op and the IOF. The article then outlines how the effect of cognitive dissonance can change the equilibrium outcome and how changes in belief can influence the equilibrium market shares. The article ends with a summary and the conclusions.

Cognitive Dissonance

The theory of cognitive consistency has been one of the most influential theories in social psychology (Jones 1985) – it has helped to chart a new course of research in decision-making and has generated hundreds of research studies in the field. Cognitive dissonance is the most widely known and researched of cognitive consistency theories and was first identified by Leon Festinger (1957) as a psychological phenomenon where there is an inconsistency between what a person believes, knows and values, and credible information that calls these cognitions into question.

Festinger (1957) identifies at least two kinds of dissonance. In the first, dissonance arises because the individual perceives two cognitions as being psychologically inconsistent or contradictory; in the second, dissonance arises because of cultural or group mores when

"culture or group standards may dictate that they do not fit" (p. 13). More formally, two related elements (x, y) that exist in a person's cognition are dissonant if not-x follows from y – i.e., the obverse of one element would follow from the other. According to this theory, the inconsistency between any two cognitions (dissonance), being psychologically uncomfortable, motivates the person to reduce the dissonance. The more important are the cognitions, the greater is the magnitude of the dissonance; at the same time the greater the magnitude of this dissonance, the greater is the impulse to reduce it. The main ways of reducing dissonance include altering one's behavior, seeking information that is consonant with existing behavior, or distorting new information. Therefore, the theory of cognitive dissonance not only predicts systematic differences in the interpretation of pre-specified information sets but also biased receptivity to new information according to one's beliefs (Akerlof and Dickens 1982). Although the theory of cognitive dissonance is prominent in social psychology, where it was intensively developed in the 1960s and 1970s, it was only at the beginning of the 1980s that it begun to receive attention in the economics literature.

The model in this article shares a basic intuition with the main models in the literature of rational-choice cognitive dissonance that started with Akerlof and Dickens (1982). In this literature individual beliefs are modeled as choice variables in a person's utility function and individuals trade off utility from beliefs against utility resulting from their actions (Dickens 1986; Nagler 1993; Rabin 1994; Montgomery 1994). In many cases additional factors such as conformity or uncertainty are incorporated to further modify the basic model. Nevertheless, these economic models are applied almost exclusively to individual decision-making and ignore any institutional arrangements in the marketplace that may trigger such phenomena. The model developed in this article is distinct from these approaches in that we examine cognitive dissonance in a setting where a cooperative competes with an investor-owned firm in a local market and where consumers have to choose the organization from which

to purchase. In our model it is the unique characteristics of the two organizations with respect to the local community that generate the dissonance.

A Model of Cognitive Dissonance: Cooperative vs. IOF

General Description of the Model

The concept of cognitive dissonance is captured by introducing *preferences over preferences*, which means that agents now have preferences over their beliefs over the state of the world they are in. An agent's beliefs are assumed to be *partially flexible* and are introduced directly into the utility function as a choice variable. Individuals are assumed to form their beliefs pragmatically and then choose their actions to maximize utility.[1]

The model looks at a two-period world consisting of a local cooperative and an IOF that is the local branch of a multinational corporation. Consumers are able to observe the qualities and the prices of the two products that are being offered and then decide whether to purchase a unit of good from the IOF or the local co-op. The model further assumes that the IOF enjoys economies of scale and/or scope and therefore is able to potentially offer its product in a better price or to provide a higher quality.

In period one (benchmark case) both firms offer physical identically products and compete in a mixed oligopoly. However, the distinct features of the two organizations, due to their different nature, produce different cognitions for the individual. Locally owned cooperatives, especially in rural areas, have historically played a critical role in local economic development and are considered to be of vital importance for local economies (Merrett and Walzer 2003). Moreover, it is documented (Fulton 1999; Fulton and Giannakas 2001) that the commitment of their members effectively differentiates cooperatives from other organizational forms, like IOFs, that focus almost exclusively on profits and serve the market as long as it remains profitable. The model adopts the standard presumption in the

cognitive dissonance literature that people view themselves as "nice and caring persons", which implies that individuals care about their local community and want to support it. Hence, consumers' initial cognition is that the local co-op is a superior organization (i.e., offers a better quality product) since it enhances the local economy and hence the local community; this cognition is consonant with the cognition they have for themselves – i.e., that they are good persons that want to help their community.

In period two, consumers receive new information that signals that the IOF's product or service has became relatively better. For instance, this might be the case where the IOF undertook new investments that enhanced the quality of its product relative to the co-op. Alternatively, poor managerial decisions from the co-op can signal to its members that their cooperative no longer operates for their best interest and therefore its perceived quality decreases (Fulton and Giannakas 2001, 2006). This new information will account for the cognitive dissonance effect, since the decision to patronize the IOF implies that the consumer chooses to experience a certain level of dissonance but get the benefit of the better price and quality. On the other hand, choosing to patronize the cooperative implies that there will be no dissonance but the consumer will have to pay a higher price for an inferior good.

In this setup, the individual is on the horns of a dilemma and she has to consider both pecuniary and non-pecuniary elements that arise from her decision. The source of dissonance is the new information in period two that signals that the IOF's product or service suddenly became relatively better. This situation will result in a cognitive dissonance effect since switching to the IOF implies that the consumer needs to recognize that the IOF is better than the co-op. Thus, in accord with cognitive dissonance theory, this customer will attempt to reduce her dissonance by modifying the belief on IOF's quality (i.e., reduce the perceived quality of its product).

Formal Model

In this section a formal model of cognitive dissonance is presented in which individuals' attitudes are pliable. The different cognitions that are associated with the two institutions imply differences in the degree to which consumers perceive their choice to be consonant with their beliefs and different consumer valuations for the two goods. In other words, even though both firms produce physically identical products, consumers attribute different qualities to them because of the different cognitions that are associated with the organizations that produce them. In this setting, consumers are presumed to have personal beliefs q_i and q_c regarding the overall quality of the IOF and the cooperative, respectively. Moreover, to capture different consumer attitudes toward these two different types of organization, the conventional assumption of consumer homogeneity is relaxed. Instead, consumers are assumed to differ with respect to a differentiating characteristic x that captures differences in their income. Another interpretation for x is that it captures physical distance that each consumer has from the two organizations. With this setup, each consumer has to decide whether to purchase a unit of good from the IOF or the local co-op. Consumers spend a small fraction of their total income to this purchase and they are uniformly distributed with respect to x.

Consider then a consumer with the following utility function:

$$\begin{aligned} U_i &= \bar{u} - p_i + q_i - tx \\ U_c &= \bar{u} - p_c + q_c \end{aligned} \tag{1}$$

where U_i and U_c are the net consumer benefits (overall utility) associated with purchasing a unit of the product from the IOF and the cooperative respectively. The parameter $\bar{u}$ is a base level of utility, while p_i and p_c are the prices charged by the IOF and the coop-

erative, respectively, with $p_i < p_c$. Parameter t is a non-negative utility reduction factor that captures the difference in utility obtained by consumers with different values of the differentiating attribute x. The greater is t , the greater are the differences in consumers' utility from the two goods. One interpretation is that t captures transportation costs where higher t-values suggest higher cost to consumers of shifting their business between the IOF and the co-op; the larger is t, the less responsive are consumers to price changes. To ensure positive market shares for the two firms, it is assumed that $0 < p_c - p_i - t < q_c - q_i < p_c - p_i$.

In this model a consumer will choose to shop from the IOF as long as $U_i \geq U_c$:

$$\bar{u} - p_i + q^1 - tx \geq \bar{u} - P_c \tag{2}$$

where the parameter q^1 captures the difference between the two qualities that consumers assign to the two organizations for period one – i.e., $q^1 = (q_i - q_c)$.

Figure 1 illustrates the decision problem that consumers are facing. The downward sloping curve graphs the overall utility when one unit of the good is purchased from the IOF, while the horizontal line slows the overall utility when the good is purchased from the co-op for different values of the differentiating attribute x (i.e., for different consumers). The consumer with differentiating characteristic $\breve{x}$ given by:

$$\breve{x} = \frac{(p_c - p_i) + q^1}{t} \tag{3}$$

is indifferent between buying from the cooperative and buying from the IOF since her utility from consuming these two products is the same. Consumers who are then "located" to the left of $\breve{x}$ (i.e., consumers with $x \in [0, \breve{x})$) purchase from the IOF, while those located to the right of $\breve{x}$ (i.e., consumers with $x \in [\breve{x}, 1]$) buy from the cooperative (Figure 1).

When consumers are uniformly distributed with respect to their differentiating attribute

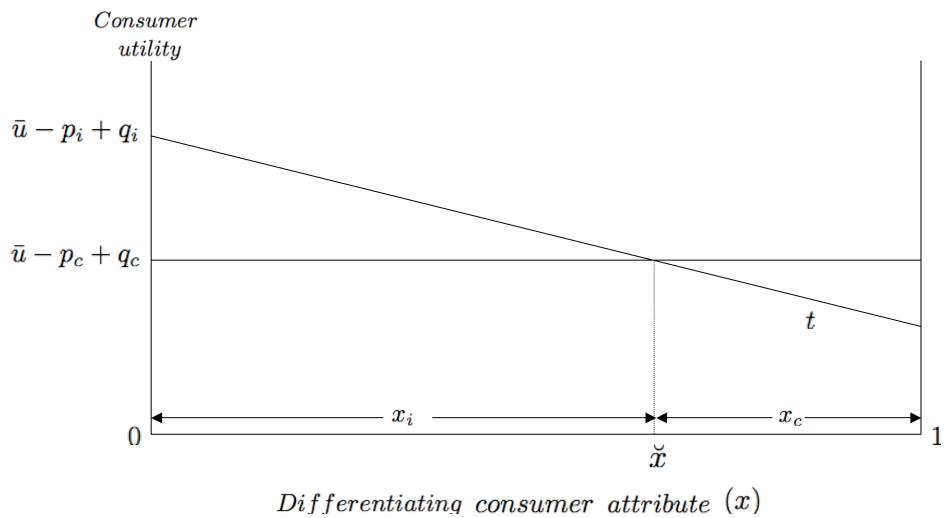

Figure 1: Consumer decisions

x, the level of x corresponding to the indifferent consumer, $\breve{x}$, also determines the market share of the IOF. The market share of the co-op is given by (1-$\breve{x}$). By normalizing the mass of consumers at unity, the market shares give the consumer demands faced by the IOF, x_i, and the cooperative, x_c, respectively (Mussa and Rosen 1978). Formally, x_i and x_c can be written as:

$$\begin{aligned} x_i &= \frac{(p_c - p_i) + q^1}{t} \\ x_c &= \frac{t + (p_i - p_c) - q^1}{t} \end{aligned} \tag{4}$$

Solving for p_i and p_c gives the inverse demand curves for the IOF and the co-op, respectively:

$$\begin{aligned} p_i &= p_c + q^1 - tx \\ p_c &= p_i - q^1 + t - tx \end{aligned} \tag{5}$$

In period one, consumers perceive the co-op's quality as being higher, therefore $q^1 \leq 0$. For simplicity and without loss of generality, let $q^1 = 0$ so that equations (4) and (5) change to:

$$\begin{aligned} x_i &= \frac{(p_c - p_i)}{t} \\ x_c &= \frac{t + (p_i - p_c)}{t} \end{aligned} \tag{6}$$

and

$$\begin{aligned} p_i &= p_c - tx \\ p_c &= p_i + t - tx \end{aligned} \tag{7}$$

Introducing Cognitive Dissonance

In period two, new information signals that IOF's quality increased relative to the co-op such that $q = q^2 > 0$; where q denotes the difference between the two qualities for period two.

Each consumer is assumed to have a subjective valuation q^* that characterizes the perceived quality of the IOF relative to the co-op; q^* is a non-negative parameter that is then compared to q, the real quality. High values of q^* imply that the IOF is considered as a superior organization compared to the co-op, while lower values of q^* signal a decrease in the IOF's relative quality.

A central theme in the theory of cognitive dissonance is the assumption of *partially flexible* beliefs that limits one's ability to change her set of initial beliefs. Simply choosing to forget past beliefs of q and act in a way that is inconsistent with those beliefs will create cognitive dissonance. For our model, even though the price and quality of the IOF is better, switching implies that the consumer now has to recognize that the IOF is su-

perior to the co-op – something that is inconsistent with her previous belief (period one). Whenever behavior is inconsistent with belief cognitive dissonance arises. Such a dissonance is unpleasant and the consumer will either choose to change her behavior or change her beliefs.

In general, the level of dissonance d will be a function of q^*, the consumer's subjective assessment of IOF's relative quality. This function is assumed to be of the form:

$$d = \frac{q^*}{q} \tag{8}$$

over the range $0 \leq q^* \leq q$. For each consumer, prior to her choice to patronize the cooperative or the IOF, q^* starts off equal to q. Cognitive dissonance is modeled by letting each consumer choose any value of q^* in the range between 0 and q.

The decision-making process in period two involves two stages. In stage one, the consumer chooses her belief on q^* that minimizes her total cost. In stage two, she chooses to buy from the IOF or the cooperative based on her belief on q^* from stage one. To avoid equilibria involving noncredible strategies, the problem is solved using backward induction (Gibbons 1992).

To examine the impact of cognitive dissonance we need to further modify the consumer's utility function by adding the cognitive dissonance cost when the perceived relative quality of the IOF equals to q^*. Assuming that cognitive dissonance has unit cost c, the cost of dissonance is $\frac{q^*}{q}c$. Therefore, a consumer who maintains a belief q^* will have a utility function of the following form:

$$\begin{aligned} U_i &= \bar{u} - p_i + q^* - \frac{q^*}{q}c - tx \\ U_c &= \bar{u} - p_c \end{aligned} \tag{9}$$

where all variables are as previously defined. Notice that in the case of the IOF, the overall utility is enhanced by the parameter q^* that captures the extra utility due to the perceived quality that is associated with doing business with the IOF in period two. Realizing $q^* > 0$ will have a cognitive dissonance cost of $\frac{q^*}{q}c$ which gets larger for higher values of q^*. However. in making their decision, consumers will trade-off the resulting dissonance cost with the price difference between the two firms and the product quality. For instance, choosing to believe in high q^* (which is more likely to lead to a purchase from the IOF) implies high dissonance cost but the consumer gets the psychological benefit of q^* and pays only p_i instead of p_c. Choosing to believe that $q^* = 0$ (which is more likely to lead to a purchase from the co-op) implies zero dissonance cost but now the consumer loses q and pays the higher price p_c. In other words, consumers can take the *right decision*: shop from the IOF and suffer some dissonance; or, they can take the *wrong decision*: avoid any dissonance cost by shopping from the co-op.

For tractability, the analysis assumes that consumers are uniformly distributed between the polar values of x. Each consumer buys one unit of the product and her purchasing decision represents a small share of her total budget. In this setting, a consumer will prefer to shop from the cooperative as long as $U_c \geq U_i$, which implies:

$$\frac{q^*}{q} \leq \frac{p_i - p_c + tx}{q - c} \tag{10}$$

with $q - c > 0$. For any given x, consumers who choose q^* that satisfies the above equation shop from the local co-op compared to consumers who choose higher values of q^* and switch their business to the IOF. Notice that choosing to believe in low q^* implies that the consumer sets $q^* = 0$; the rest will set $q^* = \frac{q(p_i - p_c + tx)}{q-c}$ and shop from the IOF.

The consumer correctly perceives that choosing to believe in $q^* = 0$ will result in making the wrong decision and shop from the co-op. Therefore, choosing $q^* = 0$ minimizes the

dissonance cost; the cost of making the wrong decision (C_1) is the difference between the real utility that comes from the IOF and the utility of the co-op. Thus:

$$C_1 = p_c - p_i + q - tx \tag{11}$$

Alternatively, the consumer can pick a q^* equal to the critical level of equation (10) and shop from the IOF. She will then choose to believe in $q^* = \frac{q(p_i - p_c + tx)}{q-c}$; the result of this choice is that she suffers the minimum possible dissonance cost (C_2), which is:

$$C_2 = \frac{p_i - p_c + tx}{q - c} c \tag{12}$$

The consumer will choose the value of q^* that minimizes costs; hence she compares C_1, the cost of making the wrong decision, with C_2, which is the dissonance cost. Accordingly, the consumer should choose $q^* = 0$ if $C_1 < C_2$ and choose $q^* = \frac{q(p_i - p_c + tx)}{q-c}$ if $C_1 > C_2$.

For consumers who choose to believe in high q^* and hence patronize the IOF:

$$c + tx < p_c - p_i + q \tag{13}$$

which implies that the consumer with differentiating characteristic $\hat{x}$, given by:

$$\hat{x} = \frac{p_c - p_i + q - c}{t} \tag{14}$$

is indifferent between buying from the cooperative and buying from the IOF since her utility from consuming these two products is the same. Consumers who are then characterized by $x \in [0, \hat{x})$ purchase from the IOF, while the rest buy from the cooperative.

Since consumers are uniformly distributed with respect to the differentiating attribute x, the location of the indifferent consumer $\hat{x}$, will also determine the market share of the

IOF; the market share of the cooperative is given then by (1-$\hat{x}$). By normalizing the mass of consumers at unity, the market shares give the consumer demands faced by the IOF, x_i, and the cooperative, x_c, respectively. Formally, x_i and x_c can be written as:

$$\begin{aligned} x_i &= \frac{p_c - p_i + q - c}{t} \\ x_c &= \frac{t - p_c + p_i - q + c}{t} \end{aligned} \tag{15}$$

Solving for p_i gives the inverse demand curve for the IOF:

$$p_i = p_c + q - c - tx \tag{16}$$

while the inverse demand for the cooperative is:

$$p_c = p_i - q + c + t - tx \tag{17}$$

The equilibrium market shares and the demand curves for both the cooperative and the IOF are directly linked with the cognitive cost (c) and the true quality (q). In the case of the IOF the cognitive dissonance creates the extra cost of c that negatively affects its demand and its equilibrium market share. However, the new information in period two results to a higher IOF quality and hence has a positive effect on the two parameters (x_i, p_i). Higher q (i.e., the higher is the IOF's relative quality) and/or lower c imply that the overall dissonance cost decreases and hence the overall perceived IOF quality will increase – lower dissonance cost for given q^* makes it easier for consumers to forget their high valuation for the co-op. The opposite holds for the case of the cooperative; higher q and/or lower c negatively affect its market share since it is now easier for its members to switch. Alternatively, lower q and/or higher c makes it harder to abandon the cooperative and

implies strong ties between the co-op and the local community.[2]

Substituting the value of $\hat{x}$ into equation (10) gives the critical value of dissonance that arises in equilibrium:

$$\frac{q^*}{q} = 1 \tag{18}$$

Figure 2 illustrates how the dissonance level changes with respect to the differentiating attribute x. The bold dashed kinked curve shows the effective level of $\frac{q^*}{q}$ for every x. The consumers that are located just next to the IOF ($x \in [0, x_\lambda]$) have zero dissonance. However, as one moves more farther from the IOF ($x > x_\lambda$), consumers have to believe in higher values of q^* in order to shop from the IOF. The more far away one moves from the IOF the higher the level of dissonance. The last IOF customer is located at $x = \hat{x}$ and sets $q^* = q$ – i.e., the actual quality. After that point, the costs associated with shopping from the IOF are too high and all consumers to the right of $\hat{x}$ set $q^* = 0$ and buy from the co-op.

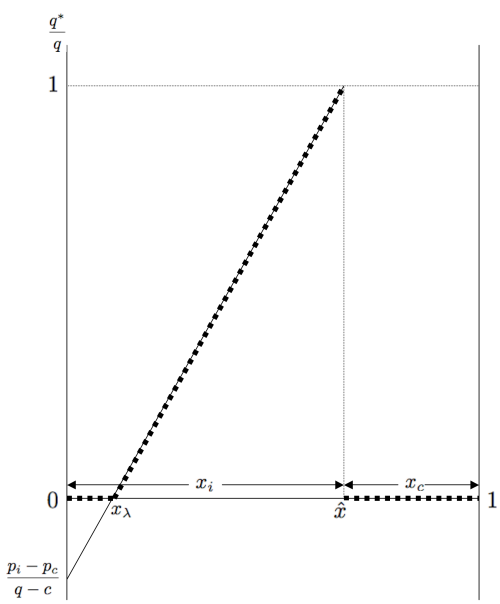

Figure 2: Dissonance level

An interesting result is the three consumer groups that arise in equilibrium. The first group is those consumers who are characterized by $x \in [0, x_\lambda]$. They are the most fortunate since they can "have their cake and eat it too." They do not experience any dissonance ($q^* = 0$) and at the same time they take the *right decision* – i.e., shop from the IOF and take advantage of the better price and quality of its product. The second consumer group is those with $x \in (x_\lambda, \hat{x}]$. They also take the *right decision* but their overall utility is less than the utility of the first group since they also have to incur an increasing dissonance cost. The last consumer group, where $x \in (\hat{x}, 1]$, is the group that makes the *wrong decision* and remains loyal to the cooperative. Although they do not incur any dissonance cost ($q^* = 0$) they pay higher price (p_c) for an inferior good.

Comparing these results with the benchmark model from period one (equations 6 and 7) shows the effect of cognitive dissonance for the equilibrium market shares and the demands that the two firm face (Table 1).

Parameter	Period One (no dissonance)	Period Two (with dissonance)
Market share		
x_i	$\frac{(p_c-p_i)}{t}$	$\frac{(p_c-p_i)+q-c}{t}$
x_c	$\frac{t+(p_i-p_c)}{t}$	$\frac{t+(p_i-p_c)-q+c}{t}$
Inverse demand curve		
p_i	$p_c - tx$	$p_c - tx + q - c$
p_c	$p_i + t - tx$	$p_i + t - tx - q + c$

Table 1: Comparison of market shares and demands with and without dissonance

One question that can be asked is how the cooperative can effectively respond in order to adjust the equilibrium for its benefit. Assuming that the co-op has no direct control on the changes in quality, the only way to affect the result is through c. Creating close ties with the local community, increasing its members' participation in its operations and keeping

open channels with its member base will effectively increase the unit dissonance cost that a member will suffer in case she decides to shop from the IOF. In short, the stronger the ties and everyday interaction between the co-op and its member base, the harder will it be for them to shift their business to the IOF. In the case of smaller communities with closer relationships among the individuals, these dynamics will be even stronger and therefore it will be very difficult for an IOF to compete. Consequently, the co-op will be able to maintain its position in the market and even keep higher prices compared to the IOF.

One interpretation for the quality change in period two is that the IOF undertook investments that increased the quality of its product. However, our results show that the higher is c, the higher the increase in quality needs to be to have a positive effect on IOF's equilibrium market share and demand. Therefore, in cases where the co-op has already managed to create a high c, the IOF will have to undertake substantial investments in order to enhance its position in the marketplace. Considering that higher investments usually imply higher risk leads to the conclusion that it will be even harder for the IOF to increase its market penetration and more likely for the co-op to maintain its market share.

Finally, notice that another interpretation for the IOF's quality increase is that the co-op did something that decreased its own quality relative to the IOF. This will be a case where co-op members feel that their co-op does not operate for their best interest anymore. In such a case, the unit cost of dissonance for abandoning the co-op will be minimum so it may be fairly easy for an IOF to capture a much bigger share of the market.

Summary and Conclusion

The purpose of this article was to examine the impact of changes in the economic environment on consumers' cognitions and therefore their buying behavior under a mixed oligopoly. The analysis examines the case where consumers in a local community receive new infor-

mation that signals the better quality of the IOF relative to their co-op. Consumers revise their previous held beliefs regarding the role of the two organizations and choose the one with which to do business. The model developed is distinct from the standard analysis of competition and member commitment in a mixed oligopoly in that personal beliefs were introduced as a choice variable in consumers' utility function.

Analytical results illustrate that in the presence of cognitive dissonance both firms will be affected. High quality increases in IOF's product will attract new customers that need to decide if it is worth to switch or stay with the cooperative. Previous cognitions create a bond between this consumer group and the co-op; breaking this bond and switching to the IOF results in cognitive dissonance and hence added costs. Therefore, their decision-making process will involve an assessment of the overall costs and benefits of their decision.

The analysis also demonstrates that the relative magnitude of the unit dissonance cost has an important effect on the equilibrium outcome. When the increase in the IOF's quality is accompanied with relatively small dissonance cost, the IOF is more likely to increase its market share. However, strong ties between the co-op and the local community will result to higher dissonance cost and hence make it more difficult for consumers to switch.

While this article demonstrates how cognitive dissonance can effectively affect buying behavior and therefore equilibrium market shares, its results are dependent on a number of assumptions. First, throughout the article it is assumed that the cognitive dissonance cost is quite significant and enters the modified utility function as a separate parameter. However, this might not always be the case. For instance, having different cognitions regarding the IOF and the co-op does not necessarily imply strong preference for one or the other. People may prefer to shop, say, from the co-op but that does not mean that they will necessarily experience significant discomfort when they take advantage of special offers and shop from the IOF. In this case, the cognitive dissonance cost might be negligible and hence have no

impact in the decision-making process.

Second, the magnitude of cognitive dissonance is related to the importance of the two cognitions. People that perceive the two institutions as indistinguishable will never experience the dissonance. For them, buying from the co-op or the IOF is not related on the way they feel about their community and their self-image. Therefore, they will simply choose the organization that maximizes their utility without considering any additional cognitive cost.

Finally, it seems more likely that the cognitive cost c will not be a constant, but instead will change over time. This might happen because of new dynamics that will arise in the local community through time. Moreover, the size of the co-op's market share might also have an effect in c (i.e., c is endogenous) but this is subject for further investigation.

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Notes

[1]The formation of partially flexible pragmatic beliefs implies that these beliefs are most useful in utility maximization. This approach is different from the standard rational approach where individuals use the Bayes' law and form beliefs that reflect the world as it is. Akerlof and Dickens (1982) offer a nice discussion on this subject.

[2]In a case where $q^1 \neq 0$, the effect of cognitive dissonance on equilibrium market shares and demands will depend on the magnitude of $(q - c)$ relative to q^1. Equation (10) requires $q - c > 0$, therefore the IOF will have a higher equilibrium market share and face greater demand in period two.