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Non-Economic Drivers Influencing Farmers' Incentives to Cooperate: Do they Remain Robust through Policy Changes?

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Abstract

Research has shown that the structure and strategies adopted by cooperatives can be affected by market characteristics (e.g. deregulated versus regulated markets). This study examined the effects of these market characteristics on non-economic drivers that influence farmers' willingness to participate in cooperation. The example studied was the incentives of ex-sugar beet farmers in the UK to informally cooperate with their neighbors, and whether these incentives changed in response to the EU Sugar Regime Reform of 2006. The method used was regression analysis based on a theoretical behavioral framework. The results revealed that most of the non-economic drivers influencing farmers' incentives to cooperate before and after the reform were not the same. This finding has implications in relation to the theoretical basis.

Keywords: farm supply cooperatives, policy reforms, social-psychological variables

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Introduction

Over the years, the Common Agricultural Policy (CAP) of the European Union has been criticized for the high cost of the policies that it has instigated, and also for the distorting effects of these policies on the economy. These criticisms have led to important reforms of the CAP: the CAP reform of 1992 or McSharry reform; Agenda 2000; and the 2003 CAP reform (Brassley, 1997; Gardner, 2001; Kelch and Normile, 2004). Empirical studies have shown that these CAP reforms have increased the business risk in agriculture because many crop prices are now exposed to the instability arising in international markets (Hennessy, 1998; White and Dawson, 2005; Sckokai and Moro, 2006). This new political orientation has therefore altered the rural business environment and placed farmers in a more risk-based market.

Changes in the business environment caused by policy reforms may also influence the way in which agricultural cooperatives are organized. This can be inferred from an investigation reported by van Bekkum (2001) who studied the nature of dairy cooperatives from two dimensions: strategy and structure. Strategy in the van Bekkum study corresponds to the three generic strategies proposed by Porter (1980): cost leadership, differentiation, and focus strategies. Structure is characterized in that study in terms of two extreme types of organization, referred to as collective and individualized cooperatives. The results obtained by van Bekkum revealed the existence of a match between strategy and structure in deregulated versus regulated markets.

The research by van Bekkum (2001) provides important evidence illustrating that the nature of cooperation is influenced by the incidence of policy reforms. What has not been explored, however, is whether the choices regarding strategy and structure of cooperation in different business environments are linked to different social-psychological drivers that might influence farmers' decision making.

Regarding this research gap, it is worth mentioning that a number of studies have been developed in other contexts to identify how farmers adjust in turbulent business environments (for a related discussion, see Austin et al., 1998a,b; Burton, 2004). These works have revealed that not only do economic variables influence farmers' strategic behavior, but also social-psychological and behavioral drivers such as farmers' goals and attitudes towards farming (see for instance Beedell and Rehman, 1996; Austin et al., 1998a,b; Zubair and Garforth, 2006; Edwards-Jones, 2006).

The present study sought to extend the work of van Bekkum (2001) by introducing of social-psychological considerations into the analysis concerning incentives to cooperate. The aim was to determine whether social-

psychological drivers that influence farmers' incentives to participate in cooperation remain robust through policy changes. This idea is formalized in this article as the hypothesis of robust non-economic drivers.

While the present study is an extension of the research by van Bekkum (2001), it differs in terms of scope and methodology. Van Bekkum's research associated different forms of cooperation with different business environments (i.e. protected vs. liberalized markets). In contrast, the present study focuses on a single and simple form of cooperation that is used as a benchmark in order to determine whether farmers' incentives to participate in this particular form of cooperation are affected by policy reforms.

The type of cooperation selected for analysis in this study corresponds to a form of informal Farm Supply Cooperative or Cooperative Alliance that is commonly entered into by family farms in the UK. It consists of sharing resources such as land, capital, and labor with the purpose of reducing production costs. This cooperation is not subject to legal agreements and is normally formed by two or more neighbors who jointly make decisions regarding the use of their resources.

Farm supply cooperatives are defined by Gerichhausen et al. (2009) as alliances in which farmers group their resources (land, capital, or/and labor), jointly make decisions based on these resources, and then divide the gains of collaboration in a fair way. This type of cooperation helps producers to save costs by purchasing in volume and by sharing inputs including seeds, fertilizer, and farm equipment, among others. It also allows these agents to reduce information asymmetries, minimize transaction and production costs, reduce transport and communication costs, and coordinate policies (Gall and Schroder, 2006).

The present study considered a sample of ex-sugar beet farmers from the West Midlands region of the UK. This case was used as a vehicle to investigate whether farmers' incentives to cooperate remain robust through policy changes, because these farmers experienced an important policy reform, referred to as the Sugar Regime Reform, which was introduced on 20th February 2006. As a consequence of this reform, the sugar factory located in Allscott, Shropshire, was closed and sugar beet growers in the West Midlands were obliged to reformulate their production strategy in order to adjust to this political trauma.

In order to investigate the impact of the Sugar Regime Reform on farmers' incentives to cooperate, farmers' incentives before and after the implementation of the reform were compared in a questionnaire-based study. Through having estimates of both, it was possible to identify non-economic drivers that influenced farmers' willingness to form cooperative alliances after compared with before the closure of the sugar factory.

The paper is structured as follows. The next section proposes a behavioral framework that was used to test the hypothesis of robust non-economic drivers. The following sections describe the materials and methods used in the empirical part of the investigation, and present an account of the results. A final section presents the conclusions.

Behavioral framework

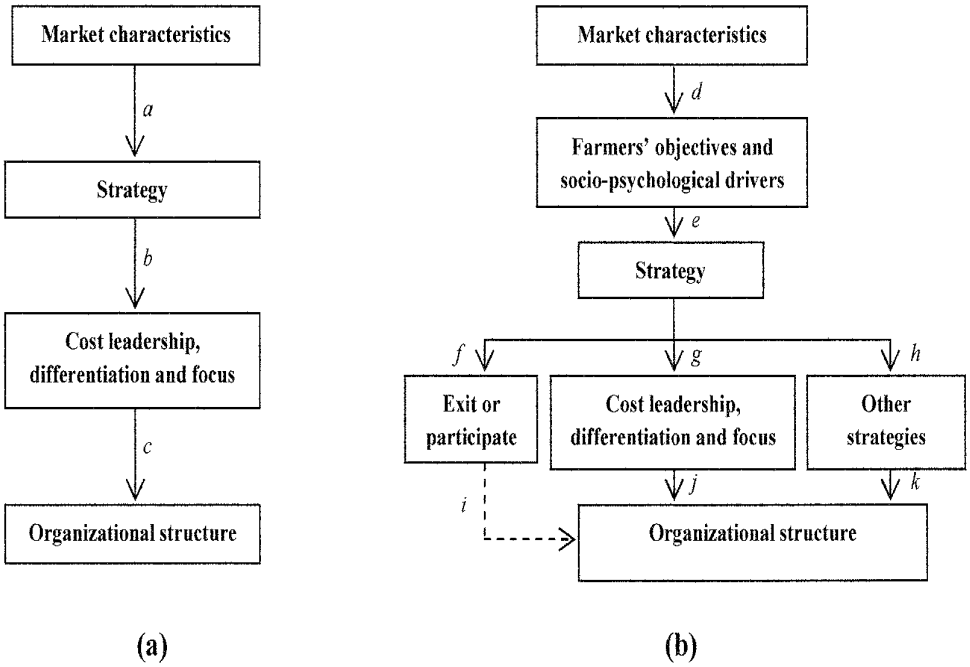
Many types of agricultural cooperation have been identified and have been classified according to different criteria, leading to a number of alternative related typologies (see for example Barton, 1989; Cook Tong, 1997; Nilsson, 1998). According to van Bekkum (2001), most typologies overlap to some extent. Hence that researcher extended and integrated them into a single model of cooperation, which is based on three main dimensions.

The first of these dimensions corresponds to organizational structure, and is based on three elements of the general definition of cooperative business (Nilsson, 2004): (i) the user-owner principle (i.e. persons who own and finance the cooperative are those who use it); (ii) the user-control principle (i.e. control of the cooperative lies with those who use the cooperative); and (iii) the user-benefit principle (i.e. benefits of the cooperative are distributed to its users on basis of their use). Based on these principles, van Bekkum (2001) argues that the structure of cooperatives can be categorized according to their level of individualization. At one extreme, “collective” structures are able to satisfy interests that are homogeneously distributed within the membership; at the other extreme, “individualistic” structures are able to satisfy interests that are heterogeneously distributed within the membership. Collectively and individualistically organized cooperatives are referred to here as traditional and entrepreneurial cooperatives, respectively (Nilsson, 2004).

The other two dimensions of the model proposed by van Bekkum (2001) are based on the market strategies introduced by Porter (1980), namely, cost leadership, differentiation, and focus strategy. Focus strategy was considered by van Bekkum as a particular form of the other strategies, which allowed him to consider cost leadership and differentiation as the other two dimensions of his proposed model.

The contribution of van Bekkum (2001) was linked to market characteristics in a scheme proposed by Nilsson and Björklund (2003). A version of this scheme is presented in Figure 1(a).

Figure 1: Relationship between market characteristics, structure and strategy



According to Figure 1(a), the current market characteristic determines the most appropriate strategy that should be adopted in order to succeed. The nature of this strategy, in turn, may determine the structure of the organization that is consistent with this strategy. However, the organizational structure can also limit the strategic choice depending on the endowments of the organization.

The present study introduced a new dimension related to farmers' strategic behavior. The proposed extension is presented in Figure 1(b), which is based on Nilsson and Björklund (2003). According to this diagram, a strategy is seen as a behavior that is determined by farmers' goals and the social-psychological drivers affecting farmers' behavior. This idea was borrowed from a research branch that has been developed with the purpose of identifying relevant economic and non-economic factors that determine farmers' strategic choices (see for example Beedell and Rehman, 1996; Austin et al., 1998a,b; Zubair and Garforth, 2006; Edwards-Jones, 2006; May and Tate, 2011).

A key feature of Figure 1(b) is that it assumes that the current market structure influences the economic and socio-psychological drivers that

determine farmers' strategic choices. Consequently, a change in the market caused by, for example, a policy reform will affect the relative importance of these drivers. This idea is formalized here as the hypothesis of robust non-economic drivers.

A behavioral framework that is appropriate to test the hypothesis of robust non-economic drivers is that developed by Bergevoet et al. (2004), which integrates two approaches with the objective of including a large range of valid variables that might explain farmers' decision making. These consist of the Multiple Goals approach and the Theory of Planned Behavior.

The Multiple Goals approach postulates that farmers do not simply consider economic variables when making their optimal decisions, but that non-economic targets also affect their behavior. The pioneer researcher was Gasson (1973), who argued that orthodox economic theory has treated non-economic variables as minor deviations from regularity, which cancel one another out when aggregated.

The Theory of Planned Behavior (Ajzen, 1985) establishes that intention is a good predictor of behavior, and that intention is determined by positive or negative beliefs that an individual has in relation to attitudes (i.e., positive or negative attitude towards a behavior), subjective norms (i.e., the influence of important referent individuals or institutions when approving or disapproving a particular behavior), and perceived behavioral control (i.e., an individual's conviction that he or she will successfully execute a behavior leading to a particular outcome). The balance of these beliefs is what determines a positive or negative intention towards a particular behavior.

The original multivariate model of Bergevoet et al. (2004) was developed in order to identify whether the size of Dutch dairy farms in terms of milk quota was determined by farmers' goals, attitudes toward farming, perceived control, or subjective norms. The researchers found that farm size was influenced by non-economic drivers such as the attitude captured by the statement "I recommend youngsters not to become farmers". A schematic representation of the behavioral framework developed by Bergevoet et al. (2004) is presented in Figure 2.

This framework has the capacity to capture a wide range of drivers that may affect farmers' strategic behavior. The drivers can be categorized, making it easier to determine their nature. In order to illustrate this fact, consider the following examples.

The strategies considered by van Bekkum (2001) are linked to the farmers' goals of maximizing profits and gaining competitive advantage in the market (Dess and Davis, 1984). These goals belong to the Multiple Goals approach presented in Figure 2. On the other hand, Bhuyan (2007) found that members'

dissatisfaction with the cooperative manager led to higher levels of disloyalty amongst members and, in some cases, cooperative abandonment. Dissatisfaction with the cooperative manager corresponds to an attitude.

Figure 2: Behavioral framework of Bergevoet et al. (2004)

Multiple Goals Approach		Economic and non-economic farmers' goals (e.g. maximize profits and maintain family tradition)
Theory of Planned Behavior	**Attitudes**	Beliefs regarding the behavior under consideration (e.g. Forming collaborative alliances will allow me to be in contact with the farming community)
	Perceived behavioral control	Individual's beliefs that he/she will or will not successfully execute a behavior leading to a particular outcome (e.g. There is not point to cooperate with my neighbors because I don't have the same resources needed to produce high quality crops).
	Subjective norms	Beliefs related to important referent individuals or institutions when approving or disapproving a particular behavior (e.g. I will form a cooperative alliance because my neighbors say that this is useful to reduce unitary costs).

Another example is presented by Don (1996), who argues that the utility of typical kibbutz members has strong altruistic elements. This explains the existing empirical deviations from the expected economic performance of the kibbutz. Altruistic interests are associated with subjective norms.

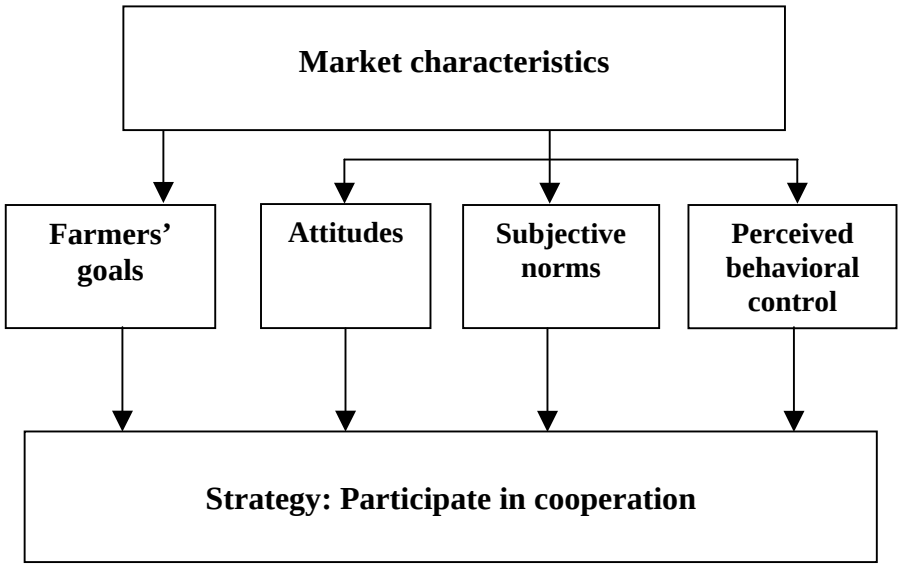
Finally, Burt and Wirth (1990) revealed that supply cooperative managers place a high premium on farmers' loyalty to the point of paying higher prices

for some inputs. Loyalty is associated with perceived behavioral control. Managers have more control over the organization when the members are loyal.

The behavioral framework in the present investigation (Figure 2) considers only a partial relationship of the complex interactions presented in Figure 1(b). This relationship corresponds to the interactions described by arrows *d*, *e* and *f* in Figure 1(b), i.e., the framework was designed to investigate the economic and non-economic drivers that explain farmers' incentives to participate in cooperation (i.e. farmers' incentives to enter or exit) and the effects of market change on these drivers. This partial analysis allowed the hypothesis of robust non-economic drivers to be tested without using excessive and unnecessarily complex analysis. Nonetheless, other relationships identified in Figure 1(b) may be considered in future research.

The behavioral framework adopted in the present investigation is presented in Figure 3.

Figure 3: Behavioral approach explaining farmers' incentives to cooperate



According to Figure 3, market structure influences farmers' strategic behavior through its effects on farmers' goals (Multiple Goals approach), and through its effects on attitudes, subjective norms, and perceived behavioral control (Theory of Planned Behavior). These drivers determine farmers' intention to participate in cooperation.

Materials and methods

In order to determine the effects of a change in market structure on farmers' strategic behavior, a sample comprising "ex-sugar beet farmers in the West Midlands region of the UK" (ESBF) was utilized. Data on the farmers' incentives before and after the implementation of the Sugar Regime Reform were used in an attempt to identify economic and non-economic drivers that explained the farmers' incentives to participate in cooperation after the closure of the sugar factory, and to examine whether these were different to the drivers operating pre-closure.

According to the statistics of the Department for Environment, Food and Rural Affairs (2010), the total number of sugar beet farmers in the target area in 2005 was 592, of which 48 were sampled (corresponding to 8.1 per cent). There was a 100% response rate. This sample was interviewed over a period of six months, starting in January 2008. Farmers were visited by the author in their workplace and were asked to fill in a questionnaire during the visit. The data collection method was based on a combination of cluster, stratified, and snowball sampling techniques. These sampling methods were chosen because a list of sugar beet farmers was not available in the public domain. Before adopting these techniques, different unsuccessful attempts to obtain a random sample were made.

The sample cluster was selected by choosing the most relevant counties of the West Midlands region in terms of the number of sugar beet farmers, namely Shropshire, Worcestershire, Herefordshire, Staffordshire, and surrounding areas (accounting for 48%, 15%, 14%, 12%, and 11% of the total sugar beet farm holdings in 2005, respectively). The sample considered relatively similar proportions for these counties in terms of the number of farmers that participated in the investigation (accounting for 46%, 15%, 13%, 15%, and 13%, respectively).

The sample stratification was made considering the size of the farm in terms of number of hectares. It was not possible to find official statistics on this variable. Nonetheless, a criterion was established based on the opinions of the 10 farmers that formed the pilot sample. The precaution was taken to include a balanced number of farmers in the classes defined by this measure.

The snowball technique was developed separately in each respective county. As a result, it was possible to find a number of sugar beet farmers consistent with the sample cluster strategy defined above. Given the difficulty in gathering data from primary sources and the small population of sugar beet farmers, the sample used in this study can be considered appropriate in this context.

A questionnaire was used in order to capture economic and non-economic drivers of farmers' incentives to cooperate. It considered the two approaches that form part of the behavioral approach developed by Bergevoet et al. (2004), namely Multiple Goals and Theory of Planned Behavior. The statements used in the questionnaire were intended to obtain information on farmers' goals, attitudes, perceived behavioral control, and subjective norms, and were adapted from those used by Bergevoet et al. (2004) and Willock et al. (1999). In addition, new statements on market barriers were introduced in the item on perceived behavioral control. Market barriers such as a power imbalance in the producer-retailer relationship could affect farmers' beliefs regarding their ability to succeed, which in turn could influence their incentives to cooperate. A five-point Likert scale was used to capture the value that farmers attributed to the statements included in the questionnaire (see Appendix A).

The statement "*Forming collaborative alliances with my neighbors is important for me*" was used as a proxy of farmers' incentives to cooperate, and was employed as the dependent variable in the regression model.

Stepwise linear regression models were used, with G_i, A_j, $P_{k,}$ and N_l representing the Likert scale variables obtained from the statements on farmers' goals, farmers' attitudes toward farming, perceived behavioral control, and subjective norm, respectively. The regression model used in this study was defined as follows:

$$(1) \qquad ICAi = \beta_0 + \sum_i \beta_i G_i + \sum_j \beta_j A_j + \sum_k \beta_k P_k + \sum_l \beta_l N_l + \sum_m \beta_m B_m$$

where *ICAi* is a Likert scale variable describing the importance that farmers attribute to participation in cooperative alliances (i.e. farm supply cooperatives). If $i = 1$, then $ICAi = ICA1$ describes the importance that farmers attribute to cooperative alliances before the Sugar Regime Reform. In contrast, if $i = 2$, then $ICAi = ICA2$ describes the importance that farmers attribute to cooperative alliances after the Sugar Regime Reform.

Results and discussion

The results obtained from the econometric analysis are presented in Table 1. Column 1 reports the results of the regression for the case "after the Sugar Regime Reform". Column 2 shows the results obtained "before the Sugar Regime Reform". Two observations were eliminated because two respondents did not answer some of the questions.

Table 1: Results of the econometric analysis

Variables	1. After Sugar Regime Reform (n = 46)	2. Before Sugar Regime Reform (n = 46)
Intercept	2.48** (3.01)	0.08 (0.06)
I have control in a variety of situations	0.30***(3.61)	
My goals and objectives are clear		-0.58*(-2.55)
I regularly negotiate with suppliers and buyers		0.45**(3.16)
I can further lower the cost of my production		-0.29*(-2.45)
I can increase the sales price of my production		0.35*(2.38)
Farming is still fun and satisfying	0.22*(2.43)	
Legislation spoils the pleasure in my work	0.88***(-5.30)	
The increasing amount of regulation interferes with my plans for the future	0.37***(3.59)	
I am not familiar with the productive process of more profitable crops	0.48***(5.33)	
I am not interested in other alternatives	-0.23***(-3.70)	
Retailers have too much negotiation power	0.41**(3.10)	0.35*(2.38)
R^2	0.74	0.44
S.E. Regression	0.52	0.52

*P < 0.05, **P < 0.01, *** P < 0.001, t-ratios in parenthesis.

According to Table 1, only one variable was significant in explaining the importance that farmers attributed to participation in cooperation in both periods of time. This variable corresponds to the market barrier "*Retailers have too much negotiation power*". As the table shows, there was a positive

coefficient of this variable in both regressions, meaning that farmers who assigned higher value to this market barrier considered the formation of cooperative alliances as a strategy to reduce costs both before and after the Sugar Regime Reform.

This result may indicate that farmers who believe that retailers have too much negotiating power feel that they obtain an unfair price and, therefore, a loss of gross margin from the power imbalance. Consequently, these farmers would be willing to form cooperative alliances to reduce costs, in order to offset this loss to some extent. Because power imbalance was not influenced by the Sugar Regime Reform, it is not surprising that farmers considered this barrier to be important both before and after the reform. Power imbalance in the UK is a consequence of the structure of the food industry (Collins and Burt, 1999; White, 2000; Burt and Sparks, 2003; and Duffy et al., 2003),

As Table 1 also shows, most of the drivers explaining farmers' incentives to cooperate were not robust through the Sugar Regime Reform, implying that the hypothesis was rejected. The main implication is that the nature of economic and non-economic variables that influence farmers' attitudes towards the formation of cooperative alliances depends on the current business environment. In particular, variables associated with farmers' knowledge of their own goals and objectives; farmers' ability to negotiate with suppliers and buyers; and farmers' ability to affect production costs and output prices seemed to be the most relevant drivers of cooperation in stable environments (i.e. pre-Reform environments). In contrast, variables associated with farming enjoyment; family farm; legislation; and self-motivation in terms of adopting more profitable crops seemed to be the most relevant drivers of cooperation in unstable business environments. These variables are discussed in more detail below.

Drivers of cooperation in a stable, pre-reform business environment

The variables concerning drivers of cooperation when the business environment is stable were ordered according to the theoretical approaches considered by the proposed behavioral framework,. No statement linked to the Multiple Goals approach and the subjective norms was significant in the case of the pre-reform business environment.

a) Statement linked to "Attitudes"

My goals and objectives are clear. The negative coefficient of this statement (-0.58) reveals that farmers who assigned higher value to this variable

considered the formation of cooperative alliances less important. This suggests that when the business environment is stable, cooperative alliances are seen not only as a means of obtaining lower unitary production costs, but also as a way of organizing cooperatively when farmers' goals and objectives are not clear. Farmers may use this sort of organization to learn from their partners and to jointly establish the goals and the objectives of the cooperation. In contrast, when the business environment is unstable, this variable is not relevant. This could reflect the fact that it is difficult to establish goals and objectives in turbulent conditions. Consequently, cooperative alliances are not useful in overcoming farmers' lack of clarity regarding their own objectives.

I regularly negotiate with suppliers and buyers. The positive coefficient of this statement (0.45) reveals that farmers who assigned higher value to this variable considered the formation of cooperative alliances more important. This result suggests that farmers who participate in cooperative alliances have more frequent contact with suppliers and buyers. These alliances are perhaps viewed not only as a means of reducing unitary costs, but also as a way to increase farmers' ability to negotiate with suppliers and business, i.e., as a way to gain negotiating power. However, this variable is not relevant when the business environment is turbulent. This suggests that it is not possible to gain negotiating power from cooperative alliances designed to reduce unitary costs in these environments.

b) Statements linked to "Perceived Behavioral Control"

I can further lower the costs of my production. The negative coefficient of this statement (-0.29) reveals that farmers who assigned higher value to this variable considered the formation of cooperative alliances less important. This result is not surprising. Farmers who can lower the costs of production by themselves do not need cooperative alliances to achieve this cost reduction. What is surprising, however, is the fact that this determinant of cooperation is only valid in stable business environments. It would seem that when the environment is turbulent, farmers' capacity to reduce productive costs is not associated with their willingness to participate in cooperative alliances designed to reduce these costs. This suggests that in turbulent business environments, cooperative alliances are formed to achieve other objectives as well. These possible objectives are investigated below.

I can increase the sales price of my production. The positive coefficient of this perceived behavioral control statement (0.35) reveals that farmers who assigned higher value to this variable considered the formation of cooperative alliances more important. This result is apparently related to the variable "*I*

regularly negotiate with suppliers and buyers" discussed above. Thus, it is possible that cooperative alliances are seen not only as a means of reducing unitary costs, but also as a way to increase farmers' ability to negotiate with suppliers and businesses and, in this way, gain negotiating power. This additional negotiating power might explain why farmers who attributed higher importance to the formation of these alliances were also able to increase their sales price. It is important to highlight the fact that this variable is only relevant in stable business environments. However, this sort of cooperation seems not to be strong enough to help farmers increase their negotiating power when the business environment is turbulent.

Drivers of cooperation in an unstable, post-reform business environment

a) Statements linked to the multiple goals approach

I have the control in a variety of situations. The positive coefficient of this statement (0.30) means that farmers who assigned higher value to this goal considered cooperatives as important in reducing costs. A possible explanation is that distrust between the members of the cooperation (see Banaszak, 2008; Gerichhausen et al., 2009) is reduced when farmers have more freedom from supervision and more control on their farms. Having control over their farm allows farmers to increase their ability to monitor and prevent bad practises that could potentially be adopted by partners of the alliance. This might explain why farmers who have more control over their farms assigned higher importance to the formation of cooperative alliances. It is important to remember that this result is only valid in turbulent business environments. This suggests that the distrust problem is more severe given the higher levels of uncertainty.

b) Statement linked to "Attitudes"

Farming is still fun and satisfying. The positive coefficient of this variable (0.22) means that farmers who assigned higher value to this statement considered cooperative alliances as important in reducing costs. This result might reflect the fact that some farmers preferred to sacrifice some income in order to enjoy a farming lifestyle. Since lower income can be compensated for by the cost reduction resulting from cooperative alliances, cooperation can probably be seen as a mechanism to support a farming lifestyle. However, this argument is only valid in turbulent business environments. A possible explanation is that farmers protect themselves in these conditions by adopting

strategies that help them to sustain the lifestyle that they normally enjoy in stable business environments.

c) Statement linked to "Subjective Norms"

Legislation spoils the pleasure in my work. The negative coefficient of this variable (-0.88) suggests that farmers who assigned higher value to this subjective norm did not consider cooperative alliances to be important in reducing costs. It is possible that farmers who felt that pleasure in their work was reduced by legislation were less motivated to be involved in farming activities such as participation in cooperative alliances. As evidence of this, one respondent reported considering stopping farming in response to the Sugar Regime Reform.

The increased amount of regulation interferes with my plans for the future. The positive coefficient of this variable (0.37) means that farmers who assigned higher value to this subjective norm considered cooperatives as important in reducing costs. According to this result, regulation is seen as a barrier to the development of future plans. It is possible that farmers who assigned higher value to this subjective norm considered cooperative alliances as important strategies to overcome these barriers to some extent. The provision of decoupled payments after the 2003 CAP reform is conditional upon cross-compliance rules including environmental, animal health and welfare, and food safety regulations (Daugbjerg and Swinbank, 2007). According to Ridier et al. (2008), cross-compliance rules generate additional transaction costs that prevent farmers from participating in these voluntary contractual programs and, in this way, affect their future plans. Thus, the use of cooperative alliances may help farmers to overcome the transaction costs by reducing both information and administrative costs. Because this result is only valid in turbulent business environments, it can be concluded that the negative effects of regulation on farmers' future plans is more severe in these environments. This suggests that farmers' actions are more limited in turbulent conditions and that the formation of cooperative alliances allows these individuals to overcome this problem to some extent.

d) Statement linked to "Perceived Behavioral Control"

I am not familiar with the production process for more profitable crops. The positive coefficient of this variable (0.48) means that farmers who assigned higher value to this market barrier considered cooperatives as important in reducing costs. In relation to this result, many farmers stated that they were unable to produce crops with high levels of gross margin. In order to overcome this problem, they specialized in certain traditional crops with relatively low

gross margins in order to gain cost advantages from economies of scale. This focus on gaining economies of scale explains why these farmers assigned higher importance to the formation of cooperative alliances, and why they were not familiar with the production process for more profitable crops. This result is only valid in turbulent business environments. It is possible that farmers adopt strategies that allow them to gain economics of scale in order to help them to survive in unfavorable and uncertain conditions.

I am not interested in other alternatives. The negative coefficient of this variable (-0.22) suggests that farmers who assigned higher value to this market barrier did not consider cooperatives as important in reducing costs. This probably reflects a self-sufficient attitude of farmers having successful farm enterprises. This sort of self-sufficient behavior has also been identified by other researchers (Hingley et al., 2006). Basically, self-sufficient behavior is present in farmers who consider themselves successful, unwilling to interact with other farmers, and unwilling to explore alternatives that are not directly related to their assumed successful businesses. The fact that this variable is only relevant in turbulent environments might reflect that these farmers were indeed in a better position to survive in unfavorable conditions. Why would a farmer of this nature be willing to join less successful farmers in unfavorable conditions?

Conclusions

This study examined whether economic and non-economic drivers explaining farmers' incentives to form cooperative alliances as a means of reducing unitary costs remain robust through policy reforms. The example of ex-sugar beet farmers was considered, as these individuals recently experienced an important reform referred (the Sugar Regime Reform on 2006). The results revealed that most of the non-economic drivers that influenced farmers' incentives to cooperate before and after the reform are not the same.

This finding has important implications in relation to the theoretical basis represented by the van Bekkum theory that market characteristics influence farmers' choices to adopt the most convenient strategy that is needed to maximize profits or to maintain their competitive position in the market. The strategies that are normally considered as relevant in order to adjust to the current market condition are cost leadership, differentiation, and focus, which is not surprising assuming that cooperation serves as a way to increase profits and to create competitive advantage.

The results presented here provide an alternative view of the way in which farmers select their strategies in order to adjust to market change. A strategy is conceived as a behavior that is adopted to complete with objectives that can be either economic or non-economic. This behavior can be influenced by socio-psychological drivers that may change in response to market change. For example, exiting from cooperation in response to a policy reform is a strategy that could be adopted to maintain family tradition when the direction of the cooperative deviates from this goal after the reform (e.g. by diversifying the production plan in order to differentiate in the market). This goal may be reinforced by psychological considerations triggered by changes in the business environment.

The theoretical development proposed here provides a number of possible links between changes of market characteristics, non-economic drivers, farmers' strategic choice, and organizational structure. Here only a simple interaction between these elements was considered, but it would be interesting to explore other more complex relationships, for example, the link between changes in market characteristics and market structure when farmers' strategic choices are influenced by non-economic drivers.

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Appendix A: Statements used in the questionnaire

Importance that farmers attribute to collaborative alliances as a way to reduce productive costs (ICA)

*ICA*1) Importance of collaborative alliances before the Sugar Regime reform.
*ICA*2) Importance of collaborative alliances after the Sugar Regime reform.

Farmers' goals (G)

G1) Achieve an income as high as possible
G2) Enjoy my work
G3) Provide for next generations
G4) Have sufficient time for leisure
G5) Maintain nature and environmental value
G6) Produce a good and safe product
G7) Gaining recognition and prestige as a farmer
G8) Belonging to the farming community
G9) Maintaining the family tradition
G10) Working with other members of the family
G11) Feeling pride of ownership
G12) Enjoyment of work tasks
G13) Preference for a healthy, outdoor, farming life
G14) I enjoy having a purpose and value hard work
G15) Have independence and freedom from
G16) Have the control in a variety of situations

Farmers' attitudes, perceived behavioral control and subjective norms

Attitudes (A)
A1) Achieve low debts on my farm
A2) My goals and objectives are clear
A3) I try to be among the highest producing farms
A4) I regularly negotiate with suppliers and buyers
A5) I like to try new things on my farm
A6) Keeping my farm up to date is very important to me
A7) In decision-making I take the environment into consideration, even if it lowers profits
A8) Off-farm income is important for sustaining our farm
A9) When making an important decision I ask for a lot of advice

A10) I take challenges more often than other farmers
A11) I use my equity capital as a risk buffer
A12) I try to minimise contract work
A13) Farming is still fun and satisfying
A14) I would seriously advise young people not to become a farmer

Subjective norm (N)
N1) The way other farmers think about my farm is important to me
N2) I consider government policy unpredictable
N3) Legislation spoils the pleasure in my work
N4) The increasing amount of regulation interferes with my plans for the future

Perceived behavioral control (P)
P1) I'm well informed on the relevant legislation for my farm
P2) I can further lower my production costs
P3) Before I take important decisions I thoroughly inform myself
P4) When I need a new loan, I always go to the same bank
P5) I can increase the sales-price of my production
P6) Administrative obligations consume a lot of time on my farm
P7) I don't make plans because they don't work out in reality
P8) The markets for more profitable crops are very selective
P9) I am not familiar with the productive process of more profitable crops
P10) I am not interested in other alternatives
P11) My land is not appropriate to produce more profitable crops
P12) I don't have the necessary capital and machinery to produce more profitable crops
P13) Retailers demand quality that it is difficult to achieve
P14) Retailers demand a volume that I cannot produce
P15) Retailers have too much negotiation power
P16) Access to markets for more profitable crops requires collaborative alliances that are difficult to form
P17) I am not able to innovate to the extent required to enter the market for more profitable crops
P18) I don't have the productive efficiency to the extent required to enter the market for more profitable crops