

## Behavioural Drivers of Business Competitiveness in Agriculture

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### **Abstract**

*Business competitiveness is normally associated with performance. In this context, a firm that performs well under some criterion such as profitability is said to be competitive. Researchers, using performance as a proxy of business competitiveness, have identified different drivers of competitiveness including capital and knowledge acquisition, among others. The objective of this article is to extend this research to show that behavioural factors may also influence business competitiveness. In order to test this idea, a sample of ex-sugar beet farmers was studied using the theory of planned behaviour. For this purpose, a Probit econometric model was adopted. The results have revealed that competitiveness in agriculture is influenced by behavioural factors reflecting farmers' attitudes towards risk, pleasure at work, farmers' perception on their ability to innovate, and farmers' perception on their ability to quickly adjust in response to business environment changes.*

**Keywords:** *Business Competitiveness; Farmers Performance; Social-Psychological Drivers*

### **1. Introduction**

The concept of business competitiveness is ambiguous and difficult to define as a consequence of its multiple dimensions. Nonetheless, this concept is normally associated with economic performance. In this context, a firm that performs well under some criterion such as profitability for example, is said to be competitive (Wagner and Schaltegger, 2003; Wagner, 2007). Nowadays, the linkage between economic performance and competitiveness has been internalised by the academic community and they are normally used as interchangeable terms. This is clearly identified in a current debate on corporate sustainability performance which refers to the social, environmental and economic performance of sustainable development. According to Wagner (2011), the problem that researchers aim to solve in this area is how to implement corporate sustainability performance without affecting economic performance and competitiveness. In this context, Schaltegger et al. (2012) use the terms economic performance and competitiveness as interchangeable: “*This ‘traditionalist’ view argues that firms face a trade-off between (better) environmental or social performance on the one hand and (worse) economic performance or competitiveness on the other*” (p. 99).

In considering performance as a proxy of business competitiveness, researchers have

identified a number of determinants of competitiveness. Some of them are described as follows.

In the 1980s the research on competitiveness was focused on the relationship between performance, investment and R&D (see for example Hoskisson and Hitt, 1988). This pure economic perspective has been extended in posterior years to explore how performance is influenced by other less direct factors. For example, Abeson and Taku (2009) found that information and knowledge obtained by owners of small firms from their social networks (e.g. colleagues, salesmen, trade publications, family members, and social contacts) helps the firm to be competitive. In this regards, some studies have found that effective acquisition and use of knowledge “*is associated with enhanced quality performance, in terms of decreased process variation, increased product quality and reliability, reduced process defects, cost and cycle time and increase worker morale*” (Abeson and Taku, 2009, 89). Other investigations have analysed the issue of basic skills (e.g. numeracy and literacy) as drivers of competitiveness. According to Addis (2003), basic skills affect competitiveness because they are associated with personal development, occupational skills and informational technology skills. These skills can be obtained from training, education and formal qualification (Gibb, 1997). Finally, work practices have also been identified as drivers of competitiveness. For example, Black and Lynch (1997) found that the higher the average educational level of production workers within a plant, the more likely the plant has performed better than average over a determined period of time. Likewise, the higher the proportion of non-managerial workers who use computers, the higher is firm productivity (this has also been identified by Krueger, 1993). In contrast, these researchers did not find evidence supporting a significant relationship between performance and training variables.

These studies have provided important insights of the factors that explain firms’ business competitiveness from a traditional point of view based on the assumption of rational individuals. However, alternative investigations have revealed deviations from rationality that are not explained by the traditional tradition. This is the subject of the Behavioural Economic approach which objective is to study and explain deviations from rational choice theory. For example, deviations may arise when individuals are unable to process all available information; the strategy spaces is large and complex enough to rely on optimization processes; they don’t have control over some situations; they have social preferences that deviate from self-interest such as reciprocity, altruism, paternalism, and aversion to inequality; and when decision making is influenced by emotional and psychological impulses, among others (Shogren and Taylor, 2008; Kovacic and Cooper, 2012; Crawford, 2013).

In terms of economic performance, a number of studies in the area of behavioural economics have investigated firms’ deviation from optimal decisions. Some of them are focussed on the issue of imitation behaviour. That is, it is argued that sometimes firms prefer to imitate the strategies of their more successful peer rather than calculating their own complex optimal strategy, particularly appealing when the cost of such calculation is relatively high (Burdett and Judd, 1983; Schipper, 2009). Imitation can lead to suboptimal decisions when successful peers send noisy signal about optimal actions (Banerjee, 1992; Weizsäcker, 2010). Other researchers have investigated vengeful behaviour towards firms that are perceived to obtain an unfair share of industry profit. In this research, vengeful behaviour refers to the cost incurred by a firm in order to harm

unfair firms (Fehr and Schmidt, 1999). As a result of this vengeful behaviour, the former obtain sub-optimal results in terms of performance. Another line of research is focussed on the issue of satisficing behaviour. The idea considered in this research is that some firms prefer to obtain a target level of profit rather than a maximum profit. In this context, a firm may follow a rule of thumb in which no action is taking if it achieves a level of profits that is not lower than the average profits observed across all markets (Oechssler, 2002). This sort of almost-optimal behaviour can lead to significant deviations from optimal behaviour implying poor economic performance (McKelvey and Palfrey, 1995). Finally, the research on behavioural economics has also considered psychological variables in explaining reduced performance. One of them is over-optimism about one's own ability or the probability of favourable outcomes. For example, over-optimism behaviour has been identified in firms that are over-confident about the outcome of investment initiatives as well as decision on entry decisions (de Meza and Southey, 1996; Camerer and Lovallo, 1999; Malmendier and Tate, 2008). Another psychological factor that has been investigated by researchers is uncertainty about the rationality of rivals. In this case, a rational firm may have an incentive to mimic the behaviour of a non-rational firm in order to induce its rival to believe that it is also a non-rational firm leading to low performance in the market. This line of investigation has been used to explain for example predatory pricing in order to prevent new potential entrants (see for example Kreps and Wilson, 1982).

In summary, the research in the area of behavioural economics has been useful to identify the influence of behavioural considerations on performance, namely: imitation of strategies adopted by successful firms; vengeful behaviour; satisficing behaviour; over-optimism; and uncertainty about the rationality of rivals. It is interesting to notice that an alternative research developed in the rural area has identified other behavioural factors in other contexts such as incentives to innovate and participate in social networks, among others (see for example Willock et al., 1999; Bergevoet et al., 2004; May et al., 2011; May, 2012). This research has adopted the theory of planned behaviour to identify the influence of social-psychological factors on these decisions, but not on economic performance. The objective of this article is to contribute in filling this gap by introducing the theory of plan behaviour as an additional tool to study the influence of behavioural considerations on economic performance. The aim is to extend the traditional behavioural economic research with the purpose of identifying potential psychological factors that are relevant in the rural sector and have not fully been explored so far. For this purpose, a model based on this theory is proposed.

The proposed model was tested using a probit econometric modelling approach based on a questionnaire that contains a number of statements that reflect the main components of the theory of planned behaviour. The questionnaire was used to collect data from a sample of ex-sugar beet farmers in the UK. The results revealed that farmers' beliefs about the advantage of being involved with suppliers and buyers, future plans, ability to innovate and to take risk, effect of legislation on pleasure at work, keep informed, and quality of land are all behavioural factors that affect economic performance.

This article is organised as follows. Section 2 describes the relevant research on the theory of planned behaviour with the objective of contextualising the proposed behavioural model. Section 3 describes the proposed behavioural model. Section 4 explains

the methodology adopted to study the influence of behavioural drivers on performance. This method is based on the proposed model. Section 5 shows the results. Finally, Section 6 concludes the paper.

## 2. The theory of planned behaviour

The *theory of planned behaviour* was introduced by Ajzen (1985) as an extension of a related social-psychological theory referred to as *the theory of Reasoned Action* (TRA) developed by Fishbein and Ajzen (1975). The TRA is based on the idea that there is a correlation between behavioural intention (i.e. individual's strength of intention to perform a behaviour) and attitudes (i.e. the degree to which a person has a favourable or unfavourable evaluation of the behaviour in question) and subjective norms (i.e. the perceived social pressure to perform or not to perform the behaviour). In other words, a person will have an intention (motivation) to behave in a particular way as long as he has an attitude toward this behaviour (positive attitude), and as long as the people who are important for him think that he should perform this behaviour.

The predictive power of the TRA been confirmed in different investigations (Ajzen et al. 1982; Fredricks and Dossett, 1983). For example, it has been found in early research that consumers' behaviour in terms of purchasing an item is explained by this theory (see for example Ryan and Bonfield 1975,80). Nonetheless, this approach has been criticised for a number of reasons. A major one is the fact that the TRA does not consider situations in which there are factors that escape from the boundaries of individuals' voluntary control. For example, a person facing budget constraints cannot perform the action of purchasing a determined item, even when having the intention to do it (Sheppard et al. 1988). In order to overcome the weakness of this theoretical approach, Ajzen (1985) extended the TRA by incorporating a new element referred to as Perceived Behavioural Control, and the resulting approach from this extension is what is known as the Theory of Planned Behaviour (TPB).

The perceived behavioural control element of the TPB is based on the concept of *control beliefs*, that is, individual's beliefs about the existence of factors that can facilitate or difficult the performance of the behaviour<sup>1</sup>. For example, a person would perform the behaviour of purchasing an item as long as he has the attitude to do it, and as long as this individual perceives that this behaviour is under his/her control.

According to Ajzen (1991) each of the three components of the TPB (i.e. attitudes, subjective norms, and perceived behavioural control) is associated with a specific belief. In relation to attitudes, Ajzen (1991) explains: "*Generally speaking, we form beliefs about an object by associating it with certain attributes, i.e., with other objects, characteristics, or events. In the case of attitudes toward a behaviour, each belief links the behaviour to a certain outcome, or to some other attribute such as the cost incurred by performing the behaviour. Since the attributes that come to be linked to the behaviour are already valued positively or negatively, we automatically and simultaneously ac-*

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<sup>1</sup> It is worth mention that Perceived Behavioural Control comes from the Theory of Self Efficacy. This later establishes that the actual behaviour depends on the conviction that an individual has in terms of executing successfully a behaviour leading to a particular outcome (Bandura 1993).

quire an attitude toward the behaviour” (p. 191). This idea is reflected in the following expression:

$$A \propto \sum_i^n b_i e_i \quad (1)$$

Where  $A$  denotes attitude,  $b_i > 0$  is the strength of belief  $i$ ,  $e_i$  is the subjective evaluation of the belief's attribute  $i$ , and the symbol  $\propto$  denote proportional to. As an example, consider the attitude of an individual toward the behaviour to go to the beach<sup>2</sup>. There are two associated belief's attributes: developing skin cancer ( $e_1$ ), and meeting people of the opposite sex ( $e_2$ ). Let us assume for simplicity that  $A = b_1 e_1 + b_2 e_2$ . Because  $e_1$  can be considered as a negative attribute (that is,  $e_1 < 0$ ) and  $e_2$  a positive attribute ( $e_2 > 0$ ), if  $b_2 e_2 > -b_1 e_1$ , given the strength of each attribute, then  $A > 0$  for which this person has a positive attitude toward the behaviour of going to the beach.

Regarding subjective norms, on the other hand, Ajzen (1991) explains: “Normative beliefs are concerned with the likelihood that important referent individuals or groups approve or disapprove of performing a given behaviour” (p. 195). This idea is represented in the following expression:

$$SN \propto \sum_i^n n_i m_i \quad (2)$$

Where  $SN$  denote subjective norm;  $n_i > 0$  is the strength of normative belief  $i$ ; and  $m_i$  is the person's motivation to comply with the related referent. Coming back to the example of the beach, suppose that there subject of this example has two referents: his/her parents ( $m_1$ ); and her/his friends ( $m_2$ ). If the individual's parents disapprove the behaviour of going to the beach, then  $m_1 < 0$ . In contrast, if the individual's friends approve this behaviour, then  $m_2 > 0$ . Let assume that  $SN = n_1 m_1 + n_2 m_2$ . If  $n_2 m_2 < -n_1 m_1$ , then  $SN < 0$  for which this individual will have a negative subjective norm toward going to the beach<sup>3</sup>.

Finally, in relation to the type of beliefs associated with perceived behavioural control, Ajzen (1991) explains: “These control beliefs may be based in part on past experiences with the behavior, but they will usually also be influenced by second-hand information about the behavior, by the experiences of acquaintances and friends, and by other factors that increase or reduce the perceived difficulty of performing the behavior in question. The more resources and opportunities individuals believe they possess, and the fewer obstacles or impediments they anticipate. The greater should be their perceived control over the behaviour” (p. 196). This idea is summarised in the following expression:

$$PBC \propto \sum_i^n c_i p_i \quad (3)$$

Where  $PBC$  denote the perception of behavioural control;  $c_i > 0$  is the control belief

<sup>2</sup> This example is a version of that given by Ajzen (1991), p. 194.

<sup>3</sup> Notice that in the original example provided by Ajzen (1991), the variable  $m_i$  can only take positive values from 1 to 7. The present article has considered positive values for approval and negative values for disapproval for illustrative purposes.

of factor  $i$ ; and  $p_i$  is the perceived power of the particular control factor to facilitate or inhibit performance of the behaviour. In the example above, suppose that there is one control belief: the use of protective cream against skin cancer ( $c_1$ ). Let us assume for simplicity that  $PBC = c_1 p_1$ . Because  $c_1$  can be considered as a positive control (that is,  $c_1 > 0$ ), and given the strength of this attribute, it is concluded that  $PBC > 0$  implying that the person belief that he/she has control over the behaviour.

The TPB assumes that the behavioural intention toward a particular behaviour is the result of these three forces according to the following expression:

$$BI = w_A A + w_{SN} SN + w_{PBC} PBC \quad (4)$$

Where  $BI$  is the behavioural intention toward a particular behaviour; and  $w_A$ ,  $w_{SN}$ , and  $w_{PBC}$  are weights that the person puts on attitudes ( $A$ ), subjective norms ( $SN$ ) and perceive behavioural control ( $PBC$ ).

Empirical works have revealed that the TPB have more predictive power than the TRA (see for example, Ajzen and Madden, 1986; Sniehotta, 2009). Given this advantage, a number of applications based on this approach have been made to predict behaviour. They include intensions with respect to losing weight (Schifer and Ajzen, 1985); leisure participation (Ajzen and Driver, 1991); using Information Systems (Mathieson, 1991); health-related behavior (Godin and Kok, 1996); unethical behaviour (Chang, 1998); electronic commerce adoption (Pavlou and Fygenson, 2006); and undergo genetic testing (Wolff et al. 2011), among others.

The TPB has also been applied to predict farmers' behaviour. Early works in this area used this approach to investigate farmers' intentions to adopt friendly environmental practices. In relation to this point, Austin et al. (1998) argues: "*the current change in emphasis in European agricultural policy from maximising productivity to the promotion of schemes which are targeted on the conservation of the rural environment (e.g. the EU set-aside scheme) has led to an increased interest in the attitudes, psychology and decision-making processes of farmers. One reason for this interest is that it is necessary to have a detailed understanding of the motivation of farmers in order to design and present policy initiatives in such a manner as to promote uptake and to foster desirable social developments in rural areas*" (p. 204). An example of how the TPB has been applied within this context is found in Beedell and Rehman (2000). These researchers used this approach to identify the underlying determinants of farmers' conservation-related behaviour. This research has been extended to explore other types of farmers' behaviour such as their incentives to participate in social networks (May and Tate, 2011); innovate (May et al., 2011); and cooperate (May, 2012).

In spite of the success of the TPB to predict behaviour in different contexts, this theory has been subjected to a number of criticisms. Firstly, some researchers have found that the correlation between intention and actual behaviour rarely achieves values larger than 0.7 (see for example Armitage and Conner, 2001; Sheeran, 2002; Schulze and Wittmann, 2003). Likewise, the correlations of attitudes, subjective norms and perceive behavioural control with intentions have been found to range between 0.4 and 0.6 (McEachan et al. 2011). This empirical evidence suggests that the predictability power of the TPB is bounded. Secondly, it is argued that this theory is based on cognitive processing, but not on affective processing. Consequently, it does not include emotional variables such as threat and fear that may influence behaviour (Conner and Armitage,

1998; Rapaport and Orbell, 2000; Wolff et al. 2011). Finally, some researchers argue that the constructs contained in the TPB may not be sufficient to fully explain individuals' behaviour (Conner and Armitage, 1998; Ajzen, 2011; Manning and Bettencourt, 2011).

In spite of these criticisms, the TPB has proved to be a useful tool to predict farmers' behaviour. Nonetheless, the current article recognises the potential sources of biases described above. Consequently, the results reported in this research have to be considered with caution.

### 3. The proposed behavioural model

The proposed behavioural model captures the idea that performance (as a proxy of competitiveness) not only reflect the aspects described in the introduction (i.e. investment, R&D, network formation, basic skills and work practices), but also good managerial practices carried out by firms' managers. Managers' decision on adopting good managerial practices is, in turn, affected by social-psychological drivers. In terms of the theory of planned behaviour, this idea is introduced as follows.

The relevant behaviour that this article addresses is the behaviour of performing well and is seen as a mediating variable between performance and behavioural factors that affect managers' decision making. According to the theory of planned behaviour, this behaviour may be influenced by attitudes reflecting beliefs about performance that are associated with certain attributes such as the level of debts in the farm, farmers' incentives to invest and farmers' aspirations, among others. The behaviour of performing well may also be influenced by subjective norms which, as explained in the previous section, reflect beliefs related to the importance that farmers attribute to referent individuals in terms of approval or disapproval of performing the relevant behaviour. In the context of the current research, referent individuals may be neighbour farmers and policymakers. Finally, the behaviour of performing well may also be influenced by perceived behavioural control understood as farmers' beliefs about their ability to control difficult situations that can prevent them from performing well. This behavioural approach has also been applied in agriculture in other contexts (see for example Beedell and Rehman, 2000; Zubair and Garforth, 2006).

In considering the behaviour of performing well from the theory of planned behaviour point of view and the traditional factors that affect performance that are described in the introduction, the following hypotheses are proposed:

Hypothesis on attitudes: Performance is influenced by farmers' attitudes or beliefs about performance that are associated with determined attributes.

Hypothesis on perceived behavioural control: Performance is influenced by perceived behavioural control or farmers' beliefs about their ability to control difficult situations related to performance.

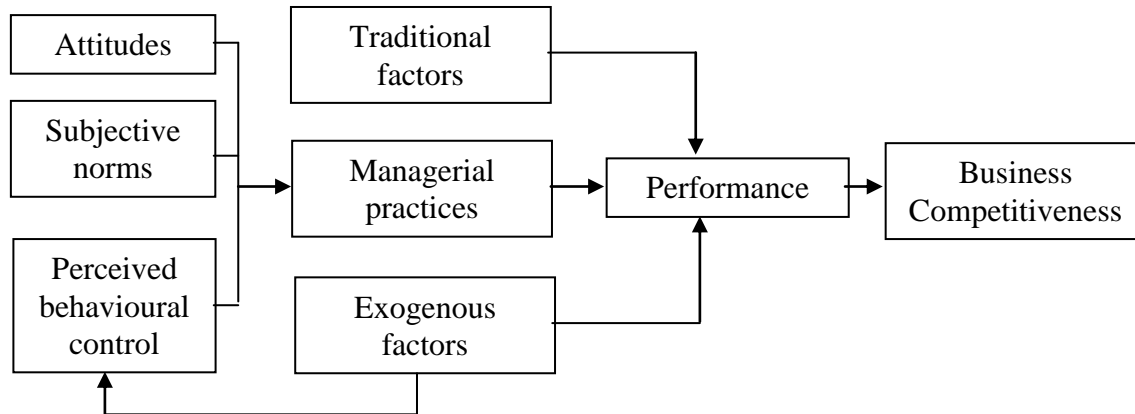
Hypothesis on subjective norms: Performance is influenced by subjective norms or farmers' beliefs about the approval or disapproval of referent individuals.

Hypothesis on traditional factors: Performance is influenced by traditional factors such as investment, R&D, network formation, basic skills and work practices.

Hypothesis on exogenous factors: Performance is influenced by exogenous factors such

as market restrictions, land quality in agriculture, power imbalance in the supply chain, etc.

These hypotheses are the basis of the behavioural model of performance proposed in this article. This model is presented in the following figure.



*Figure 1. The proposed behavioural model.*

According to this model, business competitiveness reflects performance. Performance, in turn, is explained by exogenous factors (e.g. market restrictions, land quality in agriculture, power imbalance in the supply chain, etc); traditional factors (i.e. those factors that have been identified by previous investigations such as investment, basic skills, network participation, etc); and managerial practices. The latter are assumed to be influenced by social-psychological drivers grouped in the three components of the theory of planned behaviour, namely: attitudes; subjective norms; and perceived behavioural control. Note that in this model exogenous factors may also affect perceived behavioural control. This is because a manager exposed to a higher number of barriers may believe that it is more difficult to control the managerial aspect of the business.

#### 4. Methodology

In order to determine whether performance is influenced by behavioural drivers, an econometric approach based on the proposed behavioural model presented in Figure 1 was designed. This econometric approach is described as follows.

A probit analysis was used to identify the drivers that influence performance. This technique was adopted to overcome a practical problem which corresponds to the fact that a variable reflecting performance was not available as the farmers in the sample were unwilling to reveal information that may be used to for this purpose (e.g. gross margin or profits). In order to overcome this problem, performance was captured using a proxy corresponding to farmers' performance perception. Farmers who responded that their farming businesses performed well were assigned a value equal to one. In contrast, farmers who responded that their farming businesses did not perform well were assigned a value equal to zero. Because this proxy is a dichotomous variable, it was found that the most appropriate technique to deal with it was probit analysis. The reason is because this econometric technique is for definition a method designed to work with



dichotomous dependent variables.

In terms of the probit econometric model adopted in this investigation, the dichotomous dependent variable reflecting performance was denoted as  $p_i$ . In this case  $p_i = 1$  for farmer  $i$  means that this individual responded that he/she performed well. Conversely,  $p_i = 0$  for farmer  $i$  means that this agent responded that she/he did not performed well. The probit model is presented as follows (see Dougherty, 2007, and Davidson and Mackinnon, 1993):

$$p_i = \int_{-\infty}^Z \frac{1}{\sqrt{2\pi}} e^{-\frac{1}{2}Z^2} dZ \quad (5)$$

where  $Z$  is a linear combination of farmers' attitudes toward managerial practices ( $A_i$ ), perceived behavioural control ( $P_j$ ), subjective norms ( $N_k$ ), exogenous factors ( $E_l$ ), and traditional factors ( $T_m$ ). Considering all these variables, the linear combination  $Z$  is defined as:

$$Z = \beta_0 + \sum_i \beta_i A_i + \sum_j \beta_j P_j + \sum_k \beta_k N_k + \sum_l \beta_l E_l + \sum_m \beta_m T_m \quad (6)$$

This linear combination is consistent with the hypotheses described in Section 3. For example, if the coefficient  $\beta_i$  is statistically significant for at least one attitude related to the behaviour of performing well, then the hypothesis on attitudes described in Section 3 is validated. In considering this statistical approach, the hypotheses described in that section are presented in statistical form as follows:

Hypothesis on attitudes:

H<sub>0</sub>:  $\beta_i = 0$  for all attitude  $i$  (i.e. attitudes do not influence the behaviour of performing well)

H<sub>1</sub>:  $\beta_i \neq 0$  for at least one attitude  $i$  (i.e. at least one attitude influences the behaviour of performing well)

Hypothesis on perceived behavioural control:

H<sub>0</sub>:  $\beta_j = 0$  for all perceived behavioural control belief  $j$  (i.e. perceived behavioural control do not influence the behaviour of performing well)

H<sub>1</sub>:  $\beta_j \neq 0$  for at least one perceived behavioural control belief  $j$  (i.e. at least one perceived behavioural control belief influences the behaviour of performing well)

Hypothesis on subjective norms:

H<sub>0</sub>:  $\beta_k = 0$  for all subjective norm belief  $k$  (i.e. subjective norms do not influence the behaviour of performing well)

H<sub>1</sub>:  $\beta_k \neq 0$  for at least one subjective norm belief  $k$  (i.e. at least one subjective norm belief influences the behaviour of performing well)

Hypothesis on traditional factors:

H<sub>0</sub>:  $\beta_l = 0$  for all traditional factor  $l$  (i.e. traditional factors do not influence performance)

$H_1: \beta_l \neq 0$  for at least one traditional factor  $l$  (i.e. at least one traditional factor influences performance)

Hypothesis on exogenous factors:

$H_0: \beta_m = 0$  for all exogenous factor  $m$  (i.e. exogenous factors do not influence performance)

$H_1: \beta_m \neq 0$  for at least one exogenous factor  $m$  (i.e. at least one exogenous factor influences performance)

In order to test these hypotheses, the probit model was estimated using Maximum Likelihood.

On the other hand, a questionnaire was employed to obtain data on attitudes, perceived behavioural, subjective norms, exogenous factors, and traditional factors. A five point Likert scale was used for most of the statements reflecting the components of the theory of planned behaviour, exogenous factors, and traditional factors. The exceptions correspond to the questions “*indicate the number of workers in the farm*” and “*indicate the number of computers that you have in the farm*”.

The statements related to the theory of planned behaviour are based on the contributions of Willock et al. (1999) and Bergevoet et al. (2004). The statements employed by these authors were revised in order to select the ones that seemed to be more appropriate for the current research. For example, the statement “*Contact with the general public is important to me, that is the reason why I invite visitors to my farm*” used by Bergevoet et al. (2004) was omitted because it was found irrelevant for issue of performance. On the other hand, some of the selected statements were adapted with the purpose of making them more appropriate for the current investigation. For example, the original work by Bergevoet et al. (2004) considers the statement “*I can further lower the cost price of my milk*”. Because this statement can only be applied to milk producers, it was replaced by a more generic statement: “*I can further lower my production costs*”.

New statements were also added into the questionnaire because it was found that Willock et al. (1999) and Bergevoet et al. (2004) do not fully acknowledge the influence of market and technical barriers on farmers’ perception on their ability to control situations related to performance. For example, a farmer may believe that he/she cannot perform well because his/her land has low quality. Consequently, this farmer might have a negative evaluation in relation to perceived behavioural control. The same may happen when a farmer is prevented from entering to highly profitable markets that deal with already established farmers. In order to capture the influence of these potential barriers, statements such as “*My land is not appropriate to produce more profitable crops*” and “*Retailers demand quality that it is difficult to achieve*” were introduced into the item exogenous factors. Finally, questions associated with traditional factors that some researchers have identified as relevant in explaining performance were also included in the questionnaire. They involve a statement used to reflect farmers’ capacity to invest; participation in social networks; basic skills; and work practices. For the latter factors, number of computers in the farm, and agricultural training and education were adopted as proxies of basic skills and work practices. The statements included in the questionnaire are presented in Appendix A.

The questionnaire was filled by a sample of ex-sugar beet farmers of the West Mid-

lands region. According to DEFRA statistics, the number of sugar beet growers in this region in 2005 was 592. 49 ex-sugar beet farmers were sampled which correspond to 8.3 per cent of this total and had a 100% response rate. This sample was collected over a period of six months starting in January 2008. The data collection method was based on a combination of cluster, stratified and snowball sampling techniques. The reason for using them was that there was not a list of ex-sugar beet farmers available in the public domain. The sample cluster was selected considering the most relevant counties of the West Midlands region in terms of the number of ESBF. A similar approach was adopted by the Rural Business Unit of the University of Cambridge and The Royal Agricultural College (2004) but in terms of regions rather than counties. The sample stratification was made considering the size of the farm in terms of the number of hectares. Finally, the snowball technique was developed separately in each relevant county. As a result, it was possible to find a number of ex-sugar beet farmers that is consistent with the sample cluster strategy defined above.

#### 4. Results

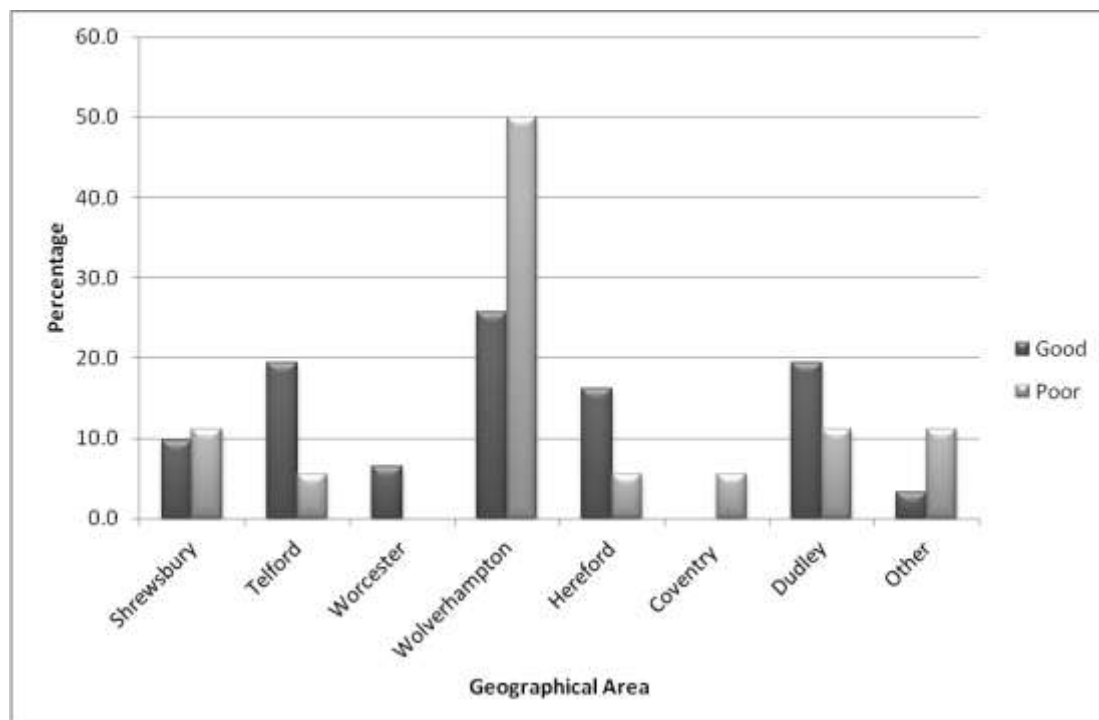
Of the farmers in the sample, 63% responded that their farming businesses performed well. In contrast, 37% responded the opposite. Some key characteristics of these two groups of farmers are presented in Table 1.

*Table 1: Key characteristics of the two groups of respondents*

Characteristics	Good Performance <i>n</i> = 31		Poor Performance <i>n</i> = 31	
	Mean	Standard Deviation	Mean	Standard Deviation
Age	49.74	10.13	55.23	8.92
Ownership (%)	46.08	38.35	42.54	39.33
Size of the farm in hectares	399.44	343.28	336.72	221.57
Agricultural training	28.00	----	13.00	----
Agricultural training (%)	90.32	----	72.22	----

According to this table, the group of farmers who responded that they performed well are on average younger. In addition, these farmers work in larger farms and have a higher percentage of ownership. Finally, it is interesting to notice that most of the farmers in this group were involved in some sort of agricultural training (e.g. they hold a bachelor degree or a certificate in agriculture). These figures suggest, therefore, that farmers' perception about their business performance might have been influenced by these characteristics.

Another difference between these groups of farmers is related to their geographical location. This information is shown in Figure 2.



**Figure 2.** Relative geographical distribution of the two groups of respondents

This figure shows that there is not an obvious distribution pattern for the group of farmers who performed well. In contrast, farmers who indicated that they performed poor are clearly concentrated in areas located near the city of Wolverhampton. Unfortunately it was not possible to find an explanation for this result given the available information collected from the data. However, this finding coupled with the results of the econometric analysis provides some possible insights. These results are presented in Table 2.

**Table 2:** Results of the regression analysis

Variable	Coefficient
<i>Intercept</i>	49.43**(1.96)
<i>I regularly negotiate with suppliers and buyers</i>	-3.95**(-1.97)
<i>I like to try new things on my farm</i>	8.10**(2.05)
<i>Before I take important decisions I thoroughly inform myself</i>	-5.08*(-1.83)
<i>I don't make plans because they don't work out in reality</i>	6.20**(1.99)
<i>I am not able to innovate to the extent required to enter exclusive markets</i>	-7.24**(-1.98)
<i>Legislation spoils the pleasure in my work</i>	-5.32*(-1.82)
<i>Legislation spoils the pleasure in my work</i>	-6.09**(-2.08)
<i>My land is not appropriate to produce more profitable crops</i>	2.75*(1.94)
<i>Number of workers in the farm</i>	
McFadden R square	0.82
S.E. of regression	0.22

\* $P < 0.1$ , \*\* $P < 0.05$ , z-ratios in brackets.

The results shown in this table support some of the hypotheses established in the current research. Firstly, the first two statements correspond to attitudes related to the behaviour of performing well implying that the hypothesis on attitudes is supported by the data used in the research. Secondly, the third, fourth and fifth statements are perceived behavioural control belief. Because these statements are statistically significant, it is concluded that the hypothesis on perceived behavioural control is supported by the data. Thirdly, the sixth statement is a subjective norm implying that the hypothesis on subjective norms is supported by the data. This novel finding proves the power of the theory of planned behaviour in explaining behavioural aspects of business performance, and this calls for their implementation in studies that are related to the behaviour of decision makers. On the other hand, the last two statements correspond to exogenous variables which, as expected, complement the behavioural analysis conducted under within the context of the theory of planned behaviour. This finding supports the proposed model shown in Figure 1 implying that the integration of behavioural consideration with exogenous variables contributes in improving the explanation power of alternative conceptual models of competitiveness and performance. Finally, it is interesting to notice that none of the traditional factors identified by related investigations were statistically significant. This does not necessarily mean that some of these factors are not relevant. For example, as shown in Table 1, most of the farmers in both groups have a sort of agricultural training. Consequently, it is not surprising that education was not significant in this case. In spite of this, behavioural variables between farmers were clearly significant in explaining business performance. These variables are explained in detail as follows.

- a) I regularly negotiate with suppliers and buyers: According to Table 2, farmers who assigned a higher score to this attitude believed that their farming businesses performed worse. This result is surprising and unexpected. As explained in the introduction, some researchers such as Abeson and Taku (2009) have found that information and knowledge obtained by owners of small firms from their social networks (e.g. colleagues, salesmen, trade publications, family members, and social contacts) help them to be competitive. This evidence is commonly found in non-agricultural small and medium enterprises who obtain competitive intelligence from customers and suppliers (see for example Thomson et al., 2012). However, the result obtained in Table 2 suggests the opposite when considering the suppliers-buyers agricultural network. A possible explanation for this result is that efficient farmers in the UK normally sell their production to cooperatives that have negotiation power. These cooperatives pool the production of several farmers and have the ability to deal with large amounts of output. Farmers who are unable to follow this scheme have to deal with suppliers and buyers by their own. Because these farmers are small, they do not have negotiation power. As a consequence, they achieve worse economic results than farmers who sell their production through cooperatives.
- b) I like to try new things on my farm: According to Table 2, farmers who assigned a higher score to this attitude believed that their farming businesses performed better. This result indicates that farmers who have positive attitudes toward innovation and risk taking behaviour obtained better results. This finding is interesting because it was argued in the last decade that farmers did not have the skills to innovate and take risk because they operated in a protected market environment (see for instance

Lantra, 2001; McElwee and Warren, 2001; Phillipson et al., 2004). In considering this argument, the result suggests that market liberalisation as a consequence of policy reforms has helped farmers to develop these skills. This finding also contributes to the current understanding of the motivations behind business innovation in agriculture. In particular, Vik and McElwee (2011) found that farmers' incentives to innovate may be driven by non-economic motivations such as living at the farm, meet neighbours, and the need to create something, among others. Our result complements the findings by Vik and McElwee in terms of adding business performance as another motivation that could potentially lead to innovation.

- c) Before I take important decisions I thoroughly inform myself: According to Table 2, farmers who assigned a higher score to this perceived behavioural control variable believed that their farming businesses performed worse. This result is consistent with the previous one because it suggests that farmers who are too risk adverse need to thoroughly inform themselves before taking relevant decisions. It is possible that these farmers lose opportunities to perform better in the process of informing themselves when quick decisions needed to be made. Regarding this point, researchers in the area of dynamic capabilities (i.e. ability to adjust in order to maintain competitive advantage in high-velocity markets) argue that quick decisions are fundamental to survive in dynamic business environments. In this context, trial and error and improvisation processes are more likely for new ventures (Teece, 2007; Barreto, 2010). Since the business environment in agriculture has become more turbulent after the last policy reforms, it is possible then that trial, error and improvisation play a more relevant role than activities that may delay quick adjustments in the market.
- d) I don't make plans because they don't work out in reality: According to Table 2, farmers who assigned a higher score to this perceived behavioural control variable believed that their farming businesses performed better. This result suggests that farmers who are flexible enough have the ability to adapt in dynamic business environments. This is also consistent with the idea of dynamic capabilities discussed in the previous point. That is, trial and error and improvisation in turbulent environments seems to be key ingredients to survive in high-speed markets (Teece, 2007; Barreto, 2010). In contrast, rigid plans may prevent individuals from adopting quick responses in order to effectively adapt in these markets.
- e) I am not able to innovate to the extent required to enter exclusive markets: According to Table 2, farmers who assigned a higher score to this perceived behavioural control variable believed that their farming businesses performed worse. According to this result, farmers' beliefs on their capacity to innovate influence their perception on business performance. This result suggests, therefore, that performance can be improved by changing farmers' beliefs about their capacity to innovate. In relation these beliefs, researchers have found that participation in formal and informal networks plays an important role in the development of innovative capacity in rural areas because these networks provide relevant information for innovation (Boahene et al., 1999; Virkkala, 2007). Consequently, a possible strategy that may help farmers to perform better is by participating more intensively in networks because this would help them to change their beliefs about their capacity to innovate.
- f) Legislation spoils the pleasure in my work: According to Table 2, farmers who as-

signed a higher score to this subjective norm variable believed that their farming businesses performed worse. This finding reveals that pleasure at work is a relevant socio-psychological factor in explaining business performance. A key implication of this result is that if the current legislation prevents farmers from feeling satisfied at work, then this will probably cause a loss of business performance. This finding supports the arguments by Chiu (2003) and Kallstrom and Ljung (2005). According to these researchers because farming is a way of life and a social activity, lack of satisfaction at work can negatively affect farmers' decision making leading to poor results and even causing emigration from rural areas.

- g) My land is not appropriate to produce more profitable crops: According to Table 2, farmers who assigned a higher score to this exogenous factor believed that their farming businesses performed worse. This result is not surprising. Farmers having low quality agricultural land cannot obtain high levels of yields and this in turn, negatively affects farm business performance, a fact that has been supported by a number of empirical works in several countries (see for example Ellis and Freeman, 2004; Barrett et al., 2006; Marenvaa and Barrett 2007; Tittonell et al., 2010). This finding may also explain why most of the farmers who responded that they performed poor are located in areas near the city of Wolverhampton. According to the Ministry of Agriculture, Fisheries and Food (2000), land in these areas is classified as land grade of 3 which correspond to good to moderate quality.
- h) Number of workers in the farm: According to Table 2, farmers who assigned a higher score to this exogenous factor believed that their farming businesses performed better. This result suggests that the farmers in the sample operated under an inefficient part of the production function. According to Gorton and Davidova, (2004) this happens mainly in family farms because they are more labour intensive. This finding suggests that more successful farmers were the ones who hired workers in order to utilise all the available capital in the farm.

## 5. Conclusions

The results obtained in this article proved the fact that behavioural and social-psychological factors may affect business competitiveness. In particular, it was found that the three components of the theory of planned behaviour (i.e. attitudes, perceived behavioural control and subjective norms) play a key role in linking behavioural aspects of farmers with business performance. Regarding attitudes, the results revealed that farmers' willingness to innovate in terms of trying new things is the most relevant attitude that influences business performance. Farmers who were less willing to try new things performed worse suggesting that willingness to innovate is a desirable psychological attitude. Another relevant attitude is related to farmers' relationship with suppliers and buyers. According to the results, farmers who agreed to the statement "*I regularly negotiate with suppliers and buyers*" perceived that they performed worse. This result is the opposite with respect to the traditional research suggesting that contact with individuals in the supply chain can help firms to obtain relevant information that can be used to perform better. As discussed in the article, this result may be explained by the particular nature of the supply chain of the agricultural sector in the UK that operates

with cooperatives that pool agricultural production. Regarding perceived behavioural control, on the other hand, the results revealed that farmers who were less dependent on pre-existing plans and full information acquisition, and who believed that they had higher control over investment obtained better results in terms of business performance. This finding suggests that more successful farmers were the ones who had the ability to react quickly in dynamic business environments. Finally, regarding subjective norms, the results revealed that performance can negatively be affected when satisfaction at work is compromised by the current legislation. The present investigation also identified some exogenous (non-behavioural) factors that may affect business performance. They correspond to land quality and the number of workers in the farm. In relation to the latter, it appears that the farmers in the sample were labour intensive producers because performance increased as labour in the farm increased.

The main implication of the results is that business performance can be improved by adopting a behavioural approach that favours both willingness to innovate and the ability to operate in dynamic business environments. That is, a positive psychological attitude towards innovation in turbulent conditions. However, this beneficial psychological attitude may be obscured by strict regulation when it negatively impacts on satisfaction at work. It would be advisable to policymakers to consider this collateral psychological effect when planning their policies in rural areas.

It would be interesting to develop similar studies in other countries in order to identify cultural factors that may influence business performance. This possible extension is left for future research.

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### ***Appendix A: Statements used in the questionnaire***

#### *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

#### *Perceived behavioural 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

#### *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

#### *Exogenous factors (E)*

- E1) The markets for profitable crops are very selective
- E2) I am not familiar with the productive process of more profitable crops
- E3) I am not interested in other alternatives
- E4) My land is not appropriate to produce profitable crops
- E5) I don't have the necessary capital and machinery to produce profitable crops
- E6) Retailers demand quality that it is difficult to achieve
- E7) Retailers demand a volume that I cannot produce
- E8) Retailers have too much negotiation power
- E9) Producing profitable crops implies collaborative alliances that are difficult to form
- E10) I am not able to innovate to the extent required to enter the market of profitable crops

- E11) I don't have the productive efficiency to the extent required to enter the market of profitable crops
- E12) Indicate the number of workers in the farm

Traditional factors (T)

- T1) I develop investment and R&D activities in my farm
- T2) I participate in networks in the free market.
- T3) I participate in networks in the contract market
- T4) I have training and education in agriculture
- T5) Indicate the number of computers that you have in the farm