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Intensify, diversify, opt-out: testing farmer stated intentions to past and future CAP reform scenarios

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ABSTRACT

A series of studies have explored the future intentions of farm households to reforms of the Common Agricultural Policy (CAP). This paper explores the intentions of Scottish livestock farmers under proposed reforms and, using the path dependency model, estimates the effect of past decisions on determining future intentions. A large representative telephone based survey of livestock farmers was conducted over the Summer of 2013. This yielded a response rate of 1,764 observations from livestock based holdings in Scotland. A multinomial logistic regression was used to estimate the influence of various factors on either increasing or decreasing activity in agricultural and non-agricultural related areas.

Whilst hypothesised increases in payment will lead to an intention to increase activity, a reduction in payment, in some cases, also leads to stated increases in activity both in agricultural and non-agricultural enterprises. We find that the most powerful predictors of change are response to past reform, farmer age and the identification of a successor within the farm household. This latter variable is highly significant and may negate concerns over uncertainty within short-term policy planning scenarios. Overall we argue for more appreciation of longer term trajectories of change at the farm level.

KEY WORDS: Farmer intentions; Common Agricultural Policy; Path Dependency; Multinomial logistic regression

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1.0 Introduction

The Common Agricultural Policy (CAP) is currently undergoing a period of reform. Indications are that further conditions are required for farmers to receive a payment and a tightening of cross-compliance may incur restrictions on grassland management and crop planning, referred to as 'greening' (HCEFRAC, 2012). Whilst ambitions for a more ecological focus have been explicit in the reform documentation for a number of years (European Commission, 2013), the consequences of adoption and translation to the national level still need to be understood. For the bulk of its existence the CAP has tended to continue along a pathway of support for output expansion (Skogstad and Verdum, 2008; Burrell, 2009). The "MacSharry Reforms" reflected a greater desire to constrain excess supply and this has developed into more explicit aims to support multifunctional activities. The most recent change in 2003, the "Fischler Reform", proposed a payment model which could be 'fully decoupled' from production related activity. Payment was calculated on a historic reference period and eligibility criteria were established for farmers to receive the Single Farm Payment.

Releasing farmers from the requirement to produce led to a range of studies focused on the possible response of farmers (Rickard, 2004; Tranter et al., 2007; Sorrentino et al., 2011), with the emphasis of this work on their intentions to reduce agricultural production (Gorton et al., 2008; SAC, 2008) or to exit from the industry itself (Breen, 2005; Maye et al., 2009; Bougherara and Latruffe, 2010). Generally these studies find a strong influence from the CAP on future pathways for the industry. This is not surprising given the high average proportion of total farm income which comes from EU support (EC, 2014). Accordingly, uncertainty from the reform process and future payment rates must affect decision-making (Dibden and Cocklin, 2005, Lobley and Butler, 2010). The current reforms would be no different, especially as the basis of payment, away from historic reference periods, would be the most tangible output of CAP payment administration.

Uncertainties from policy reform must be contrasted with the range of external and internal influences which affect farmer decision-making (Beal 1996; Fleisher 1990; Hardaker, Huirne and Anderson 1997; Ahearn *et al.,* 2005; Harrington, 2005; Gallerani *et al*., 2008; Viaggi *et al*., 2011). The farm planning horizon is therefore affected by the whole spectrum of social networks, information provision and regulation, in addition to other short-term uncertainties centred on the weather, economic shocks and disease management (Binswanger and Sillus, 1983; Backus *et al*., 1997; Smit and Skinner, 2010; McRoberts *et al*., 2011; Kristensen & Jakobsen, 2011; Barnes and Toma, 2012; Islam *et al*., 2013).

Nested within these uncertainties is the influence of direct support payments on shifting farm planning pathways (Kay, 2003; Wilson, 2007). A number of studies have provided conceptual models on enablers of change within agriculture, whereas others have empirically tested farmer intentions to CAP reform (e.g. Lobley and Potter, 2004; Bougherara and Latruffe, 2010; Latruffe *et al*., 2013). The purpose of this paper is to explore the influence of subsidy change on farmer future intentions, and compare this against a range of internal and external factors which have been found to enable change at the farm level. This is applied through a survey of livestock farmers within Scotland, conducted with respect to the reform of the CAP in 2014. These future intentions range from intensifying and expanding production, to off-farm investment and selling up.

Accordingly, this paper is structured as follows. The conceptual approach is presented in the next section to outline the past studies in this area and how it has informed this exercise; then the process of data collection and analysis is presented, this is followed by results and discussion. We conclude with implications for future research and policy.

2.0. Conceptual Framework

Farmers have a range of management options which may keep them within or steer them away from the present farming business environment. A number of authors have conceptualised the transition process in farm planning (Kay, 2003; Wilson, 2008; Sutherland *et al*., 2012). Wilson (2007) argued that transition "is non-linear, heterogeneous, complex and inconsistent, and therefore somewhat unpredictable", whereas Sutherland *et al.* (2012), argued for smoother levels of transition which will be dictated by past decisions, namely path-dependency.

The purpose of this paper is not to empirically test these frameworks but to explore the influences which may determine the magnitude of change of a farm trajectory. Consequently, stated intentions will infer individual pathways and provide a link to the heterogeneous factors specific to farmer decision-making (Gorton *et al,* 2003; Tranter *et al*., 2007; Gorton *et al*., 2008; Lobley and Butler, 2010). Intentions can include intensifying or extensifying present agricultural activity (Breen *et al*., 2005; Brady *et al*., 2009; Bougherara *et al*., 2010); diversifying agricultural and non-agricultural activities (Lobley and Potter, 2004; Meert *et al*., 2007; Maye *et al*., 2009; Tate et al., 2012; Clancy *et al*, 2011), changing investment or allocation of land into ecosystem services (Schmid and Sinabell, 2003; Schmid *et al*., 2007; Ribeiro *et al*., 2014; Bartolini and Viaggi, 2013) or even withdrawal from agricultural or land based activity itself (Gallerani *et al.*, 2008; Latruffe *et al*., 2013; Brady *et al*., 2009; Mishra *et al*., 2010; Viaggi *et al*., 2011). Table 1 describes a set of options that may identify the type of pathway available to the farmer.

Table 1: Categories of observable activity choices within farmer pathways

Enabling factors, such as access to capital, training and information, as well supply chain relationships will determine the parameters for the farm trajectory. Consequently, it is difficult to disentangle the effect of the Common Agricultural Policy on transition change from other events, such as the introduction of new enabling technologies and national regulatory change in, for example land tenure (Baldcock *et al*., 2002; Giannoccara and Berbel, 2013). However, an extensive range of factors have been explored to explain transition change and activity choices within farming. The majority include socio-economic, age and education status (Gorton *et al*., 2008; Raggi *et al*., 2013; Lobley and Butler, 2010; Defrancesco *et al*., 2008), farm size (Raggi *et al*., 2013; Latruffe *et al*., 2013), land tenure status (Maye *et al*., 2009; Bartolini and Viaggi, 2013), membership of agri-environmental schemes (Wilson and Hart, 2000; Guillam and Barnes, 2012), biophysical and regulatory factors (Douarin *et al*., 2007; Barnes *et al*., 2009; Latruffe *et al*., 2013) and identification of succession (libery, 1978; Potter and Lobley, 1996; Errington, 1998; Wilson, 2008; Burton and Walford, 2005; Lobley *et al*., 2010).

Only a limited amount of literature has aligned specific policy reform scenarios with future intentions (Gorton *et al*, 2003; O'Donnel *et al,* 2011; Lautruffe *et al.,* 2012) and the previous Fischler Reforms in 2003 provide a precedent for the impact on how farm trajectories have been affected by instituted reforms. In addition, the effect of changing levels of payment have only merited a nominal number of studies, for instance Latruffe *et al*. (2013) and Giannocaro and Berbel (2013) explored the influence of complete payment removal on the intention to exit the industry.

The majority of studies outlined above have focused on analysing the stated intentions of farmers. However, this is recognised as a contentious area by a number of authors, as these stated intentions under hypothetical scenarios may not lead to the same behavioural outcomes (Viaggi *et al*., 2011; Latruffe *et al*., 2013). Gorton *et al*, (2008) offer compelling evidence from follow-up surveys, which match those of farmer stated intentions (Tranter et al., 2007). However, these only reflect a short time frame, and studies with longer planning horizons may be expected to have an increased variance between stated intentions and

actual behaviour. Accordingly, following the discussion above concerning farm pathways, we would expect responses to past reform to be a predictor of future intentions, as this reflects some form of policy 'lock-in' (Kay, 2003; Wilson, 2008; Sutherland *et al*., 2012). This study therefore extends the literature by firstly testing the influence of past reform on future intentions and explores a range of farming and non-farming options, as well as the influence of payment reform on these intentions. The next section outlines the survey instrument and data collected and describes the analysis method chosen.

3.0 Data and methods

3.1. Data

A telephone based survey of Scottish agricultural holdings was conducted over the Summer of 2013. A spatially representative sample of 10,000 holdings was selected using information from the June Agricultural Census on region, activity, size and farming enterprise. For a large scale survey this data source is the most appropriate as it gives national level coverage and detailed information on activity for ensuring representativeness, however it, like most Government agricultural data, has limits in terms of minimum size requirements of holding represented (SG, 2012). Business holdings with less than 0.5 standard labour requirements are discounted from the Census. Whilst this does not historically reflect those affected by CAP payment regimes, some reform scenarios for the 2014-2020 period have proposed extending the criteria for eligibility to include these smaller units (EC, 2013). Consequently, whilst we are confident that we can capture the majority of future intentions, there may be some bias with respect to under representation from farms classified as 'very very small'. Notably, inclusion of these marginal units is also a wider issue for Government and European data collection agencies if the CAP were to increase eligibility for these holdings.

The basis of the questionnaire was developed from past surveys conducted within the Scottish sector (Barnes et al., 2009; Barnes and Toma, 2012). The questionnaire had a number of sections, namely i) socio-economic and demographic factors; ii) farm related structural factors; iii) current levels of activity and payment levels; iv) proposed intentions in 2020; v) hypothetical subsidy scenarios, namely increasing payment by 25% and decreasing payment by 25%. A further scenario related specifically to farmers not currently receiving a subsidy and their activity and intentions if they were to receive payment. Finally, attitudes towards the ease of changing activities were explored.

The four behavioural responses outlined in Table 1 were further translated into 12 possible intentions related to exiting the business, changing the size of the business, the commodities produced, the intensity of production, the level of labour, as well as the levels of diversification, land use and pluriactivity categories, such as tourism, forestry and biofuels. With respect to these questions, farmers were asked along a 3 point scale, i.e. whether they intended to decrease, increase or remain stable with respect to these activities (Giannoccaro and Berbel, 2013).

The survey was administered throughout the Summer of 2013 (May – July). Overall, this yielded a response rate of 1,764 observations from livestock based holdings. These were then matched with June Agricultural Census data to provide further information on activity levels, such as size, economic size units, main activities and regions. Table 2 shows descriptive statistics for the main variables matched within the JAC. Statistical comparison, conducted through t-tests, was found to give no significant differences between key identifiers in the sample and the census.

Table 2. Survey respondents by NUTS2 region classification, mean and standard deviation

The majority of respondents were owner-occupiers (62%), 22% were tenanted, with the remainder mostly claiming some mixture of the two. Finally, table 3 shows the average spread of income from agriculture and the relative levels of type of subsidy received. This indicates that 63% of the sample had more than 50% of their income from agriculture, 51% had less than 25% of their total income from the single farm payment, but 34% had between 25 to 50%, the remaining 15% stated that more than 50% of their income came from the single farm payment.

Table 3. Average distribution of income, percentage of total sample

3.2. Estimation strategy

As responses were categorical a logistic regression approach was applied to the data. One intention related to selling up the business and this was handled as a straight binary variable (y | 0,1), with 1 reflecting the intention to sell up. For the remainder, the intentions statements were along a 3-point scale (decrease, stable, increase) and multinomial logistic regression was used. This is appropriate when categorical responses exceed a binary outcome and are not ordered in any way. Hence, in equation 1 let *J* be the number of nominal outcomes and *m* the class of y outcomes, that is, (0) stay the same, (1) increase, and (2) decrease. Thus, considering the range of outcomes (*y*) with n_0, n_1 and n_2 observations respectively, the predicted probability of the i-*th* farmer choosing a nominal outcome (y = 0,1,2) is:

$$\Pr(y_i = m|x_i' = \frac{\exp(x_i'\beta_m)}{\sum_{j=1}^{J}\exp(x_i'\beta_j)} \qquad (1)$$

Where $\beta_0 = 0$

This provides indications of the probability of a change in the independent variable (x) affecting membership of one of the three classes. The base outcome class of staying the same, (y=0), was used for referencing magnitude of intention to change. For ease of interpretation these were converted to relative risk ratios (RRR) which indicates the change in the relative risk when an independent variable increases. An RRR greater than 1 means that the risk increases as the independent variable increases. Table 4 shows the range of independent variables used for the estimation

Table 4. Description and abbreviations for the independent variables used

Estimation was conducted within Stata 12.1 (Stata Corp, 2011). In total 12 regressions were performed to represent the different intentions, with a fixed set of independent variables.

4.0. Results

4.1. Descriptives

Table 5 shows the general frequencies for the farmer intentions in 2020 under the assumption of continuation of present economic and policy conditions. Much like other studies (Tranter *et al.,* 2007; Gorton *et al.,* 2008; Lobley and Butler, 2010) the bulk of farmers propose to stay the same. However, around 20% of the sample claimed they would increase levels of activities, with a much smaller percentage claiming they would decrease levels of activity.

Table 5. Frequencies of farmer intentions under present economic and policy conditions, percentage

4.1 Intention to sell up

Table 6 shows the results from the binary logistic model for selling up the business. Where polytomous variables were recoded as dummies and estimated with a reference class, which in all cases related to where response has been coded as a 0. This occurred for the ownership variable, where RRRs are relative to owner-occupied status, and region, where RRRs compare against the North East region of Scotland.

No observations were related to past activity (i.e. selling up the business), or responding to an increase in payment levels. Naturally, a reduction in payment rates would lead to increased risk, relative to staying the same, of selling up the business. Specifically, a proposed reduction of payment of 25% on current levels would quadruple to chances of selling the business. Raggi *et al*. (2013), in a survey of 9 EU countries, found a sharp increase in the number of households stating they would exit in the event of CAP removal. Latruffe *et al.* (2013) also found around a fifth of farmers would exit the business in the long-term, if CAP payments were removed. Both of these studies found age to be significant, though of different signs. That is Latruffe *et al.* (2013) found that increasing age led to an increasing probability to exit the industry, whereas Raggi *et al.* (2013) found a negative influence, arguing that as farmers get older they are more attached to the land. We find a slight effect of age, that is marginally above 1, though this is minimal and it is difficult to infer any effect. Only a few other factors were found to be significant, whereas both other studies found an influence of size on the decision to exit. Notably, the identification of a successor generates a low relative risk ratio of below 1. That is identifying a successor would lead to an intention to stay the same rather than exit the industry.

Table 6. Relative risk ratios of intentions to sell up, compared to stay the same

4.2. Intentions to increase or decrease activity

Tables 7 and 8 shows the results of the multinomial logistic regressions with respect to the intention to increase and decrease activity respectively. Those intentions related to increasing agricultural activities (namely size of the business, intensification and on-farm investment) are strongly related to past activity response and changes in payment rates. For most of these intentions, increasing the level of activities in response to the Fischler Reforms are positive, i.e. above 1, and significant, predicting that farmers intend to continue along this trajectory. Of these, increasing off-farm investment generates the highest odds, and this could reflect the economies of scope to have the confidence to continue with this activity.

Generally changes in payments tend to behave as would be expected, that is relative risk ratios above 1 indicate increasing willingness to increase activity for payment increases, and below 1, decreasing activity for payment decreases. However, significance levels vary between the intention to increase or decrease activity. A rise in payments would lead to increasing the level of intensity, employing more labour, diversifying, investing in tourism and off-farm investment. A decrease in payment would decrease the intention to intensify, employ more labour and invest in off-farm investment. This may highlight a number of issues around the effect of subsidy payment itself and instead of total removal, a reduction in payment may encourage development of non-core farm related activities.

Other factors which prove significant are age, that is older age groups of farmers are less likely to be willing to increase in activity. Age of farmer is a typical variable in most studies and the findings here align with other research that find age to be a predetermination of changing behaviour within the farm (Morgan Davies *et al.,* 2012; Latruffe *et al*., 2013; Douarin *et al*., 2007; Giannocaro and Berbel, 2013). In addition, being educated above school level, also tends to infer a positive response with respect to increasing numbers of

agricultural and non-agricultural activities (Willock *et al.,* 1999; Gorton *et al*., 2008; Barnes *et al*., 2009; Guillam *et al.,* 2012).

The amount of regular employed labour is a positive determinant for increasing activity for most intentions. Labour was used to infer physical capacity, as farm labour use is a significant constraint to undertaking farm related activities, especially in countries with a high remoteness profile such as Scotland (Stott et al., 2005). Generally size has been inferred by Economic Size Units (Gorton *et al.,* 2008), or land area (Latruffe *et al*., 2013; Giannocaro and Berbel, 2013; Raggi *et al*., 2013) and hence this is not strictly comparable. However, these latter studies found less likelihood of exit from larger farmers which, to some extent, echoes the findings here.

Regional factors are not significant within the estimation, aside from the intention to increase the amount of land rented out (Forbord *et al.*, 2014). Relative to the North East of Scotland, which has significant area dedicated to beef production, these RRRs are all strong and at least double in the other regions of Scotland. Consequently, willingness to rent out land which is less focused on livestock production would be expected. Other studies have included region as an identifier, but are either at much higher spatial scales, for instance Giannocaro and Berbel (2013) took clusters of countries within the EU, Gorton *et al,* (2008) and Viaggia *et al*. (2013) estimated at the country level, whereas Lautruffe *et al*. (2013) and Morgan-Davies *et al.,* (2012) at smaller regional scales.

The influence of inheritance of the farm tends to be nominal and, in most cases insignificant. This contrasts to the identification of a successor which generates positive, highly significant RRRs for agricultural related activities (size, intensity, employed labour, diversification), though less so for non-agricultural related activities (aside from tourism). A range of studies have explored the importance of succession to farm planning (Ilbery, 1978; Errington, 1998; Lobley *et al*., 2010). For all three agricultural activities the identification of a successor is strongly related to these intentions.

Designation as an LFA and membership of AES tends to influence non-agricultural intentions. LFA designation has not been explored in much detail within these studies, though Lautruffe *et al*. (2013) found that LFA designation led to less likelihood of farmers selling off land. These findings reflect the limited agricultural usage of LFA land which may be embedded within farmer decision-making and, consequently leads to seeking oppourtunities outside of the traditional agricultural production frame. AES membership was explored by Giannocaro and Berbel (2013) with respect to intentions to reduce agricultural input usage, but did not find it to be a significant predictor of change.

Finally, the intention to intensify is strongly reflective of whether the farm is a specialist dairy enterprise or not. Dairy farmers are 3 times more likely to intensify in the future and twice as likely to employ more labour. Notably, this variable generates strong predictors related to non-agricultural activities, in particular increasing off-farm investment, forestry and diversification. The dairy sector is generally seen as more progressive and intensive compared to other sectors within Scotland and as such, provide a proxy for the most agriculturally innovative farmers (Withers, 2013; Barnes et al., 2011).

Table 7. Relative risk ratios of intentions to increase activity, compared to staying the same

Table 8. Relative risk ratios for intentions to decrease activity, compared to staying the same

Table 8 shows the converse to Table 7, the influences that determine an intended decrease in agricultural or non-agricultural activities. Variables were found to be less significant, reflecting the lower numbers of farmers who stated they would decrease activity. However, there is still an influence of past behaviours on theses intentions. Decreasing size, intensity, the level of employed labour, diversification, the level of land rented or contracted and decreasing AES participation all reflect a similar response to previous reforms. This tends to confirm that past activity is a significant predictor and has been overlooked to a large degree by other studies. In addition, both age and identification of a successor are the opposite to Table 7. That is if a successor is identified, farmers would be more likely to stay the same than decrease activity. The intentions to reduce both size and activities towards diversification and agri-environmental schemes (AES) are related to a decrease in payments. Certainly, the effect of reduction in pillar 1 payments leading to a decrease in AES activity may be reflective of the cost-foregone model of current funding and, may even suggest an element of cross-subsidisation of these activities. It could also reflect the attitudes of farmers towards environmental, as oppose to agricultural, production (Guillam *et al*., 2012).

Notably payment decreases in other agricultural and non-agricultural areas are not significant. This may infer a more robust response to payment decreases than expected from policy makers. However, the LFA variable also generates some high RRRs with respect to agricultural activity, namely to decrease intensity levels and this perhaps reflects the destocking trends identified by SAC (2008) with in biophysically disadvantaged areas.

5.0. Discussion and conclusions

A number of studies have been conducted on farmer stated intentions for the previous reform of the CAP in 2003. Most of these were based on what farmers would do under proposed reforms and very few provide evidence during actual reform (Lobley and Potter, 2010). However, understanding the role that CAP reform plays by informing decision-making and farming change is an essential way to benchmark response against the overly prescriptive results of modelling exercises (Moss, 2002; Breen et al., 2005; Tranter et al., 2007; Genius, 2008).

Recent climate and weather fluctuations may have increased uncertainty for future farm planning. The addition of reform of the Common Agricultural Policy will add another layer to decision-making uncertainties or may reflect Weber's (1997) contention that we operate within a 'finite pool of worry' and the full implications of CAP reform is too distant to consider for farmer decision-making.

In addition, like all surveys of future intent, the responses may have some built in bias which is reflective of present agricultural conditions and outlook. In Scotland at the time of the survey, farmers were recovering from severe wet weather incidents which led to the loss of stock in more remote areas on the farm. Consequently, we would have expected less optimism in the responses, that is more farmer's declaring to reduce activity or sell up. That we found the reverse of this may provide evidence of the robustness of the survey instrument in polling farmer opinions towards the future of their industry.

What is noticeable is the lack of any declaration to change with the majority of farmers and this aligns with previous studies (Tranter *et al.,* 2007; Gorton *et al.,* 2008; Latruffe *et al.*, 2012). However, when hypothetical support regimes are introduced the majority behave as would be expected, that is the effect of increasing payment would induce more activity and decreasing payments would induce less activity. The reduction in payments may lead to increased likelihood of selling up, especially for farmers who have not identified a successor for the business. In addition, it may engender some response to diversify into both traditional agricultural diversification activities (Maye *et al.*, 2009) or perhaps reduce the area

of land directly managed (Latruffe *et al*., 2013; Viaggi *et al*., 2013). This is important in Scotland as recent statements have highlighted that by the end of 2019, Scottish farmers may be receiving some of the lowest payments per ha across the EU (Scottish Government, 2013).

The rationale behind support for farmers is to negate uncertainties in prices and raise oppourtunities for capital investment. Notably both on-farm and off-farm investments are more likely when payments increase but show no influence when payments decrease. A growing tranche of funding has been focused on the non-market benefits which could be engendered from agricultural production as well. Notably, when pillar 1 payments increase it seems that the only activity to decrease will be A-E schemes. The abolition and utilisation of set-aside land for production may be an example of how farmer priorities are focused and how they may be influenced by payments to produce (Burton et al., 2008).

There is a degree of homogeneity in the factors which affect increasing activity. The most significant indicator seems to be the identification of a successor. This is positive and mostly significant across the options tested. Age is also strongly significant. Other socio-economic variables, such as education and holding status performed less well in predicting increasing activity. This places the farmer within a wider trajectory than CAP reform on influencing change and argues for a longer term approach to understanding the factors behind decision-making. Hence, studies on intentions may need to consider longer time frames, as the development of farming over time may be less erratic and unpredictable as Wilson (2007) contends.

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Table 2: Categories of observable activity choices within farmer pathways

Activity choice	Farmer pathways
Agricultural Activity	Productivity land use change; Efficiency transition
Labour Change	Management transition
Diversification & Pluriactivity	Production transition
Agri-Environment	Dedicated land use for non-food ecosystem services
Selling up	Retiral from farming, no succession

Table 2. Survey respondents by NUTS2 region classification, mean and standard deviation

Scottish Region	n	Standard Gross Margin (£)	Economic Size Unit*	Livestock (No)	Area (Ha)
Eastern	295	50,082.7	41.7	141.1	393.6
SD		*65,803.6*	*54.8*	*177.4*	*641.9*
Highlands & Islands	712	19,205.8	16.0	69.8	426.1
SD		*28,979.0*	*24.1*	*116.0*	*1,937.8*
North Eastern	145	35,749.8	29.8	124.1	128.2
SD		*55,619.9*	*46.3*	*205.3*	*342.0*
South Western	600	63,900.4	53.3	211.8	200.5
SD		*82,468.4*	*68.7*	*338.9*	*355.2*

** Measured as standard gross margin divided by 1200 Euros*

Table 3. Average distribution of income, percentage of total sample

	Less than 25%	25-50%	Over 50%
Income from Agriculture *(% total income)*	22%	14%	63%
Income from SFP *(% total Income)*	51%	34%	15%
Income from Non-SFP Grants *(% total income)*	92%	6%	2%

Table 4. Description and abbreviations for the independent variables used

Code	Description	Coding
RESP	*Response to past CAP reform (2005)*	*0=stay same,* *1=increase,* *2=decrease*
RINC	*Response to payment increase by 25%*	*0=stay same,* *1=increase,* *2=decrease*
RDEC	*Response to payment decrease by 25%*	*0=stay same,* *1=increase,* *2=decrease*
AGE	*Farmer Age*	*0 = <44;* *1=45-64;* *2=65+*
EDU	*Education*	*0=school educated,* *1=higher than school*
OWN	*Land Ownership*	*0=owner,,* *1=tenanted,* *2=mixed;* *3=manager*
LAB	*Labour employed*	*0=none,* *1=1-3 persons,* *2=more than 3 persons*
REG	*Region*	*0=NE,* *1=NW,* *2=SE,* *3=SW*
AES	*Member of a Agri-environmental Scheme*	*0=no,* *1=yes*
INH	*Whether the business was inherited*	*0=no,* *1=yes*
SUC	*Whether a successor has been identified*	*0=no or too early to say,* *1=yes*
LFA	*Farm in a less favoured area*	*0=no,* *1=yes*
DAIRY	*Farm is a specialised dairy farm*	*0=no,* *1=yes*

Table 5. Frequencies of farmer intentions towards 2020 under present economic and policy conditions, percentage

Intention	Stay Same	Increase	Decrease
Size	71%	23%	6%
Intensity	66%	24%	10%
Employed labour	59%	29%	12%
Diversify	81%	13%	5%
Family labour	77%	19%	3%
Tourism	86%	10%	4%
On-farm investment	69%	29%	2%
Off-farm investment	85%	13%	3%
Forestry	66%	31%	2%
A-E activity	82%	15%	3%

Table 6. Relative risk ratios of intentions to sell up, compared to stay the same

	Sell Up
RDEC	3.960***
AGE	1.001**
EDU	0.941
l.Tenanted	0.607
l.Mixed	1.016
l.Manager	0.522
LAB	0.991
l.NW	1.187
l.SE	2.264
l.SW	1.776
AES	0.652
INH	0.912
SUC	0.170***
LFA	1.092
DAIRY	1.149
N	1737
ll	-249.53
df_m	15
aic	531.06
bic	618.419

Table 7. Relative risk ratios of intentions to increase activity

1=Intentions to increase relative to stay the same

	Size	Intensity	Emp. labour	Diversify	land out	Family lab.	Tourism	On-farm invest.	Off-farm invest.	Forestry	AE activity
Activity (2005)	1.843***	1.409***	1.346***	1.222**	1.243**	1.147	1.124**	1.057	3.066***	1.713***	1.291
Payment (+25%)	0.333	1.482***	1.428***	1.183*	1.023	1.091	1.141*	1.039	1.312***	1.086	1.163
Payment (-25%)	1.016	0.800**	0.756***	0.951	1.085	1.058	1.097	1.144	0.877*	1.039	1.157
Age	0.404***	0.542***	0.469***	0.438***	0.614***	0.561***	0.662***	0.595***	0.912	0.622***	0.696**
l.College	1.543	1.518**	1.669***	1.444*	1.775***	1.109	1.492**	1.545*	1.043	1.261	1.429*
l.Tenanted	0.685	0.896	0.898	0.655	0.562**	0.802	0.451***	0.587*	0.986	1.037	0.895
l.Mixed	0.948	1.046	0.984	0.985	1.084	1.020	0.814	1.137	1.138	1.011	1.004
l.Manager	1.042	0.686	0.705	0.916	1.471	0.738	0.950	1.290	0.770	1.121	0.841
Size	1.280	1.579***	1.270*	1.548**	1.337*	1.401*	1.726***	1.503**	1.440***	1.804***	1.513**
l.NW	0.775	0.841	0.815	1.205	2.082*	0.629	0.887	3.060*	1.145	0.901	0.703
l.SE	1.352	1.165	1.053	1.222	2.210*	0.831	1.075	2.359	1.128	1.016	0.970
l.SW	1.219	0.971	1.047	1.957	2.638**	0.943	1.376	2.674*	1.383	1.314	1.101
A-ES	0.789	0.965	1.103	1.405*	1.957***	1.758**	1.681***	1.900***	1.075	1.235	1.662**
Inherited	1.411	0.935	0.831	0.863	1.048	1.302	0.700*	1.376	0.958	0.782	0.669*
Successor	2.264***	1.884***	1.779***	1.506*	1.234	1.065	1.580***	0.899	1.109	1.374*	0.991
LFA	0.610	1.798**	1.074	1.569	0.896	1.210	1.779**	1.426	4.453***	1.503	1.324
DAIRY	1.363	3.335***	1.951*	2.717**	0.641	2.025	1.773*	0.924	7.414***	2.353**	1.206
N	1737	1757	1757	1757	1757	1757	1757	1757	1757	1757	1757
ll	-249.53	-513.961	-734.293	-815.769	-489.15	-386.056	-729.831	-364.771	-734.647	-783.586	-525.695
df_m	15	17	17	17	17	17	17	17	17	17	17
aic	531.06	1063.923	1504.586	1667.538	1014.299	808.112	1495.662	765.542	1505.295	1603.172	1087.39
bic	618.419	1162.407	1603.07	1766.022	1112.784	906.597	1594.147	864.027	1603.779	1701.656	1185.875

Table 8. Relative risk ratios for intentions to decrease activity relative to stay the same

2=Intentions to decrease relative to stay the same

	Size	Intensity	Emp. labour	Diversify	land out	Family lab.	Tourism	On-farm invest.	Off-farm invest.	Forestry	AE activity
Activity (2005)	1.711**	1.969***	1.957***	1.331**	1.425**	1.201	1.043	0.989	0.513	1.549	2.258***
Payment (+25%)	1.246	0.999	0.946	0.942	1.099	1.253	1.019	1.053	0.961	1.363	1.195**
Payment (-25%)	1.846*	1.106	1.126	1.313**	1.189	0.899	1.272	1.269	1.347	0.983	1.547***
Age	1.048	1.937***	1.618***	1.666*	1.711*	2.037**	4.478***	2.292*	3.375**	2.738**	1.639
l.College	1.003	1.310	1.378	1.374	0.756	1.010	0.986	0.696	0.837	1.209	0.930
l.Tenanted	0.854	0.998	0.977	1.174	0.504	1.018	1.118	0.840	1.076	0.869	0.908
l.Mixed	1.681	1.440	1.441	1.662	0.788	0.906	1.071	1.566	0.983	1.014	0.823
l.Manager	0.000	0.938	1.106	2.318	1.472	1.764	2.273	5.131*	2.044	1.276	2.552
Size	0.941	0.925	0.938	1.513*	1.325	1.127	0.930	1.161	1.057	1.263	1.325
l.NW	3.561	1.540	1.341	1.284	5.341	0.784	5.67e+05	3.850	3.798	0.756	1.355
l.SE	3.991	1.012	1.214	1.047	4.379	0.662	4.94e+05	4.784	1.958	0.864	1.406
l.SW	3.971	1.544	1.558	2.008	5.052	1.479	7.01e+05	1.580	2.439	0.946	1.010
A-ES	1.366	0.968	1.173	0.976	0.685	0.746	0.509	1.143	0.776	0.849	1.109
Inherited	0.885	0.770	0.732	0.438**	0.473	0.823	0.355	0.773	0.600	0.460	0.829
Successor	0.551*	0.429***	0.530***	0.487**	0.458*	0.393**	0.152**	0.244**	0.254**	0.219***	0.361**
LFA	4.199	4.418***	3.169**	2.579	5.381*	1.003	2.952	2.535	4.000	5.053*	5.737*
DAIRY	1.986	2.906	2.332	3.921*	6.640*	0.935	4.194	8.971*	5.995	6.989*	8.162*
N	1737	1757	1757	1757	1757	1757	1757	1757	1757	1757	1757
ll	-249.53	-513.961	-734.293	-815.769	-489.15	-386.056	-729.831	-364.771	-734.647	-783.586	-525.695
df_m	15	17	17	17	17	17	17	17	17	17	17
aic	531.06	1063.923	1504.586	1667.538	1014.299	808.112	1495.662	765.542	1505.295	1603.172	1087.39
bic	618.419	1162.407	1603.07	1766.022	1112.784	906.597	1594.147	864.027	1603.779	1701.656	1185.875