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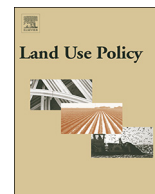
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# Preventing young farmers from leaving the farm: Investigating the effectiveness of the young farmer payment using a behavioural approach

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## ABSTRACT

The number of young farmers has decreased over recent decades in several developed countries such as the United States and European countries. A recent strategy adopted by the European Union to address the resulting age imbalance is the Young Farmer Payment which provides an additional payment on top of the average basic payment introduced in the last Common Agricultural Policy reform. The objective of this study is to determine, by means of a behavioural approach, how this payment influenced the incentives of young farmers to stay in the farm. Using the endogenous succession cycle model and the structural modelling technique, we found that the payment affected young farmers' willingness to stay through its influence on non-economic motivational goals. However, we also found that there are other factors that can be even more influential, such as pessimism about farming, community and family integration, participation in decision making, and the opinion of neighbours, among others. Based on the results, we argue that similar policies could be adopted in other countries, although policies would be more effective in addressing age imbalances if they are accompanied with complementary strategies aimed to deal with the identified social and psychological considerations.

## 1. Introduction

Current evidence has revealed that the number of young farmers in several developed countries such as the United States and European countries has decreased over the last decades as a consequence of technological, social, and economic changes (Mills-Novoa, 2011; Chen et al., 2014; Mihi-Ramirez and Kumpikaite, 2014; Bednarřková et al., 2016; Duesberga et al., 2017; Leonard et al., 2017; Morais et al., 2017). For example, in 2013 about 30% of European farms were managed by a farmer aged 65 years or older, and in some countries this figure is even higher. For example, Spain 33%, Italy 40%, and Portugal 50% (Bertoni and Cavicchioli, 2016; Eurostat, 2016).

The low proportion of young farmers is seen as a problem due to the perceived loss of potential in creating efficient, competitive, innovative and therefore more profitable and sustainable farm businesses (Council of the European Union, 2014; Zagata and Sutherland, 2015). In this respect, Hamilton et al. (2015) argue that young farmers are often more motivated to build and develop their businesses than older managers. They are generally more open to new ideas and are prepared to take greater risks, and they are also more frequently prepared to use loan capital to expand the business. In addition, there is increasing recognition that young farmers have an important role to play in meeting

the challenges of food security and global warming (EC, 2013; Davis et al., 2013).

There are a number of explanations that have been offered for the decrease in the number of young farmers. Some of them are focused on young people who face barriers that prevent them from entering the agricultural sector (e.g. high land prices and the difficulty in accessing credit and policy support), and other factors that negatively affect farm succession to younger generations (Katchova and Ahearn, 2016). The latter can broadly be classified as explanations related to ageing farmers' incentives, young farmers' incentives, economic and social context, farm characteristics, and family tradition. They are described as follows.

Regarding ageing farmers' incentives, several studies have found that the decrease in the number of young farmers has been influenced by ageing farmers' unwillingness to pass the farm to new generations due to educational, financial and motivational reasons. In relation to education, some studies have revealed that higher education of farmers had a negative effect on intra-family farm transfer (see for example Corsi, 2009; Mishra et al., 2010; Mishra and El-Osta, 2016). It is argued that this may reflect a correlation between the educational attainment of farm holders and their children, suggesting that the latter can obtain higher off-farm wages (Borec et al., 2013; Bertoni and Cavicchioli,

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2016). In terms of financial reasons, it has been found that older farmers who are concerned about their financial future and/or who do not have formal retirement plans are unwilling to transfer their farm assets, negatively affecting intra-family farm transfer (Lobley et al., 2010; Matthews, 2014). Finally, in relation to motivational reasons, some researchers argue that ageing farmers' unwillingness to pass the farm to younger generations is related to emotional, identity and human factors. That is, older farmers resist transferring the farm in order to maintain social recognition, lifestyle, identity and status that they have gained through their position as an active and productive farmer in society (Kirpatrick et al., 2012; Contzen et al., 2016; Conway et al., 2016; Riley, 2016). The main implication of farmers' unwillingness to retire is that prospective successors may become frustrated when not being involved in the farm decision making and, therefore, disinterested in working in the farm (Borec et al., 2013; Areal and Riesgo, 2014; Chiswell, 2018).

Regarding young farmers' incentives, on the other hand, current research has revealed that young farmers' level of education plays an important role in explaining their lack of interest in working on farms because more educated young farmers can find better paid employment in other industry sectors (Aldanondo Ochoa et al., 2007; Cavicchioli et al., 2018). Gender has also been identified as another factor, with some researchers having found that male potential successors are more likely to take over the family farm, and which may reflect familial norms related to the heir's gender (Sharma and Rao, 2000; Sharma and Irving, 2005; Cavicchioli et al., 2015). Young farmers' perceptions of agriculture have also been reported as a relevant factor. According to Hounsome et al. (2012), even where succession is an option, potential farm successors may not view a career in agriculture as being sufficiently attractive to motivate them into agriculture as it often involves hard physical work, loneliness, isolation, volatile economic conditions, and weather uncertainty.

Explanations related to economic and social context are based on the idea that the social-economic environment that surrounds the farm can influence young farmers' decisions to leave the farm. This has been explored by taking into account land location, income gap between sectors and the size of the agricultural sector. Regarding land location, it is argued that off-farm employment and proximity to wealthy areas can stabilise the farms, and this claim is based on results showing that the exit rate is higher in remote areas where there are fewer off-farm alternatives and opportunities for part-time farming (Aldanondo Ochoa et al., 2007; Cavicchioli et al., 2018). On the other hand, the income gap which was analysed by Bertoni and Cavicchioli (2016), found that below a certain threshold, higher income gaps between sectors decreases the probability of succession, reflecting a possible inter-sector competition on labour forces. This is consistent with the result obtained by related investigations that have found that inter-sector labour migration in general is explained by cross-sector income differences (see for example Alasia et al., 2009; Olper et al., 2014). However, above the threshold, a higher income gap increases the probability of succession suggesting that more urbanised and wealthier areas provides the opportunity to develop high value-added farming activities. Finally, the size of the local agricultural sector was studied by Corsi (2009) who found that in-farm child employment is more likely when the relative labour size of the local agricultural sector is larger. According to Corsi, this result may reflect the fact that farm succession may be considered a result of occupational choice made by potential heirs.

In relation to farm characteristics, some studies have revealed that succession is more likely in farms that are older, larger and with higher levels of investment. Reasons for these findings are that older farms have a competitive advantage given by their long history, human capital and farm-specific skills which have been passed through generations; and larger farms with higher levels of investments may be seen by young farmers as more attractive than off-farm employment (Glauben et al., 2004a; Bertoni and Cavicchioli, 2016; Cavicchioli et al., 2018).

Finally, regarding family tradition, it is argued that the choice of

becoming a farmer is strongly influenced by family tradition (Glauben et al., 2004b; Borec et al., 2013). That is, farms that have been managed by the same family over several generations are more likely to be transferred to new generations of the same family.

According to Fischer and Burton (2014), the explanations described above correspond to 'factor-based' approaches where succession is seen as the result of a mixture of favourable factors. These researchers argue that the explanatory value of these factors is low because they have failed to predict the likelihood of succession, and this is due to the fact that the connection between the process of farm construction and farmers identity construction (i.e. ways in which farm structure and farmer identity interact resulting in farms with strong family connections to the land and their farms) has not fully been considered in previous research. In order to account for this connection and to explain the low predictive power of the factors identified in previous research, Fischer and Burton proposed a model referred to as *endogenous succession cycle*, which is based on the idea that the right conditions for succession are strongly related to the development of the farm and the successor identity.

The endogenous succession cycle model considers three intertwined processes that are relevant in explaining succession outcomes: the construction of successor identities; the progression on the farm ladder; and the development of the farm business trajectories. The construction of successor identities process refers to the way by which the successor identity is constructed through farm involvement and reinforced by family farm history, sense of place and attachment to the farm. On the other hand, the progression on the farm ladder process refers to the way by which children reaffirm their successor identity by becoming progressively involved in decision-making tasks and more complex farm activities. Finally, the development of the farm business trajectories process corresponds to farm business changes that are attributed to the influence of the potential successor.

According to Fischer and Burton (2014), the effect of the factors identified in the factor-based approaches on succession depends on the nature of endogenous succession cycles. That is, when the endogenous cycle is stable, the impact of these factors is less significant because the successor identity is not compromised. In contrast, when the endogenous cycle is broken, particularly in early childhood stages (e.g. as a consequence of a period of hardship, greater schooling requirements, etc.), the impact of these factors is more severe.

In recognising the age imbalance problem in agriculture, a number of strategies have been implemented to address the young farmer problem. They include regulations aimed to facilitating new entrants to agriculture, facilitating family farm succession, or both (Kimura and Le Thi, 2013; DEFRA, 2013; Andersons, 2015).

In relation to facilitating new entrants, assistance for setting up young farmers has been available in the EU since the 1980s (Bika, 2007). For example, Measure 112 'Setting up of young farmers' (Common Agricultural Policy, Pillar II) under the 2007–2013 CAP targeted the establishment of farms by farmers under 40 years old (Kontogeorgos et al., 2017). Nowadays the most important support is Measure 6 'Business start-up aid for young farmers' under the 2014–2020 CAP, which provides a maximum funding of €70,000 in at least two instalments over a period of five years to young farmers who submit and implement a business plan (Zagata and Sutherland, 2015).

Regarding regulations adopted to facilitate family farm succession, earlier, succession has been promoted by means of early retirement schemes introduced by the 1992 CAP reforms under regulation 2079/92, which encouraged the restructuring and retirement of elderly farmers, mainly in the countries of southern Europe (Mazorra, 2000). Later on, Measure 113 'Early retirement scheme' (Common Agricultural Policy, Pillar II) under the 2007–2013 CAP was introduced with the purpose of encouraging early retirement of elderly farmers by offering a pension of up to €15,000 a year for up to 10 years (Zagata and Sutherland, 2015).

A final policy tool that has been introduced to encourage

generational renewal is the Young Farmer Payment (Common Agricultural Policy, Pillar I) as part of the 2013 CAP reform which is a compulsory scheme under Regulation (EU) No 1307/2013. This scheme requires the Member States to allocate up to 2% of the direct payment envelope to the young farmer payment, and most of them have opted for 25% of the average direct payment per hectare with a limit of 90 ha of entitlements (Zagata and Sutherland, 2015). The young farmer payment is given to farmers of no more than 40 years old who are setting up for the first time an agricultural holding and as head of the holding, or who have already set up an agricultural holding during the previous 5 years of their first application to the scheme (EC, 2016; RPA, 2016).

Several criticisms have been raised in relation to the effectiveness of these policy instruments. For example, statistics from the European Network for Rural Development (see ENRD, 2014) shows that between 2007 and 2012, Measure 112 helped more than 126,000 young EU farmers, with France being the country with the highest support accounting for more than 26,400 young farmers under this measure. In contrast, only 19 young farmers in the UK were assisted in this way during that period, reflecting a lower policy priority attached to attracting new entrants to the sector. On the other hand, it is argued that Measure 113 has not been successful in promoting inter-generational transfer and was phased out as part of the 2013 CAP reform (Davis et al., 2013; Zagata and Sutherland, 2015). Regarding the young farmer payment, the NFU (2011) calculated the maximum value of the young farmer payment at €5445 based on a basic payment in lowland areas of €242 per hectare. Andersons (2015) concluded that this assistance for young farmers within the recent CAP reforms provides a limited amount of financial support and is of little long-term consequence. Carbone and Subioli (2008) had previously drawn similar conclusions in relation to Italy, namely that the level of young farmer support available was inadequate for attracting young people into the farming sector or for encouraging family succession in existing holdings. It is also argued that the general objective of encouraging generational renewal was not reflected in the objective of Pillar 1 payments to young farmers (ECA, 2017).

Another criticism that is relevant for the current investigation is related to the endogenous succession cycle model introduced by Fischer and Burton (2014). According to these researchers, while policy intervention can influence farm succession, this influence may be low when compared to endogenous factors (i.e. factors associated with the internal dynamic of the farm) because these factors are what directly influence decisions on transferring the farm to new generations. While this is a reasonable claim in the context of the endogenous succession cycle paradigm, it appears that no quantitative work has been developed to determine its validity.

The objective of this investigation is to undertake a quantitative assessment of the effectiveness of the young farmer payment in influencing the incentives for young farmers to stay in the farm. For this purpose, a behavioural approach based on the endogenous succession cycle model was adopted.

Using the structural modelling technique, we found evidence that supports the predictions made by Fischer and Burton (2014). That is, while the young farmer payment influences young farmers' decision to stay in the farm to some extent, this decision is also affected by other stronger behavioural drivers that include external as well as endogenous factors.

This article presents the theoretical framework adopted to study the motivations of young farmers in the UK in Section 2. Section 3 then describes the methodology adopted in the investigation, with Section 4 presenting the results and Section 5 providing a discussion of findings and conclusions.

## 2. Theoretical framework

Behavioural approaches to study farmers' decision making are

widely used to identify farmers' intention to pursue a determined behaviour such as technology adoption, policy adoption, participation in cooperation, entrepreneurial behaviour, and rural immigration, among others (Ajzen, 1985; Bergevoet et al., 2004; May, 2012; Deng et al., 2016; Nakagawa, 2018). In line with this research, the current study considers the endogenous succession cycle model as the relevant theoretical development to investigate the effect of the young farmers payment on young farmers' incentives to stay in the farm.

This model was originally presented by Fischer and Burton (2014) as a qualitative development. Thus, in order to obtain a quantitative version of this approach, a theoretical framework was developed following the key ideas of the model.

As detailed in Section 1, the endogenous succession cycle model considers three intertwined processes that are relevant in explaining succession outcomes. The *construction of successor identities process* refers to the way by which the successor identity is constructed through farm involvement and reinforced by family farm history. We consider this process a key component and construct of the theoretical framework proposed in this article. On the other hand, both the *progression on the farm ladder process* and the *development of the farm business trajectories process* reflect an increase in the involvement by the potential successor from progressively assuming more complex farm activities to the ability to make relevant decisions. In considering this complexity progression, we joined these processes into a single construct referred to in this paper as *involvement progression*. Following this line of reasoning, a young farmer who has achieved a high degree of responsibility throughout involvement progression is probably in control of a number of aspects in the farm. We account for this by adding the construct *sense of control over the farm*. This would represent the last stage of the involvement progression construct.

According to the endogenous succession cycle model, young farmers' motivations are influenced by the three intertwined processes which in this article are captured by the constructs *construction of successor identities process*, *involvement progression* and *sense of control over the farm*. In considering this influence, we add the construct *young farmers' motivations* into the proposed theoretical framework.

Finally, Fischer and Burton (2014) argue that the influence of 'factor-based' approaches on young farmers' incentives to leave the farm depends on the current state of the endogenous succession cycle. That is, these factors would be stronger in preventing succession when some of the processes of the cycle are weak or broken, particularly at early stages of childhood. As described in Section 1, there are a significant number of factor-based approaches that have been identified in the literature. In order to simplify the number of these factors, this investigation considers three generic exogenous factors captured by three different constructs: *beliefs about the farming sector*; *beliefs about policy support in general*; and *beliefs about the young payment*. The aim of introducing the first construct is to account for external market and economic conditions that may affect young farmers' incentives to leave the farm. The second construct was introduced to reflect the influence of policy support in general on farmers' incentives to leave. Finally, the young farmer construct was introduced to explore how this exogenous factor influences young farmers' motivations within the context of the endogenous succession cycle model. It is important to clarify, however, that there are more factor-based approaches identified in the literature. However, using generic constructs has the potential to get some insights of the effects of exogenous factors without complicating the theoretical framework in excess. A scheme of the theoretical framework based on the considerations discussed is presented in Fig. 1. More complex versions of this framework are left for future research.

In this figure the oval shapes represent the constructs that reflect the endogenous succession cycle model. For example, the construct *construction of successor identity* inform about the successor identity that was created mainly in childhood. This construct affects both the constructs *involvement progression* and *sense of control over the farm* because, according to the theory, a failure in the process of creating successor

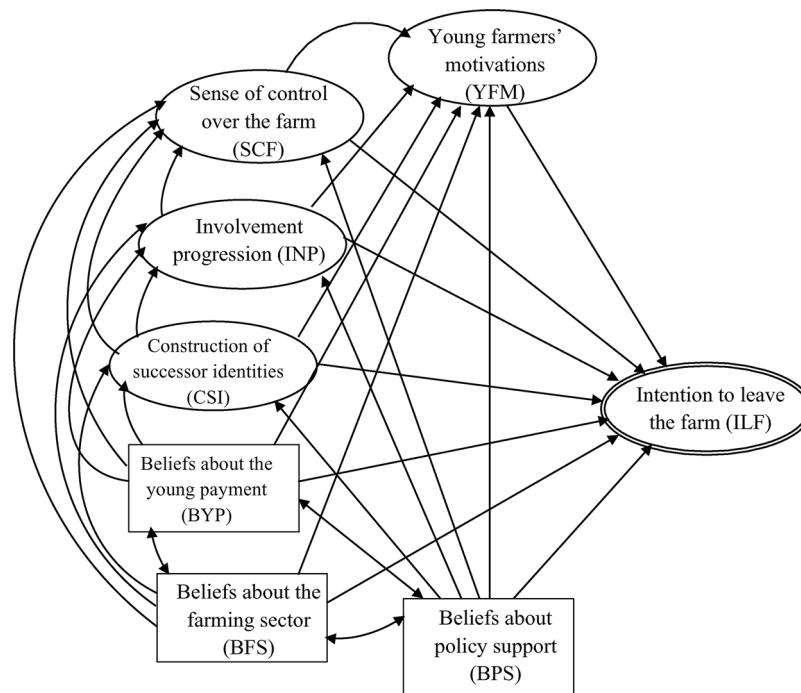


Fig. 1. Theoretical framework based on the endogenous succession cycle model.

identity at early ages negatively affects young farmers' involvedness in the farm activities. These three constructs, in turn, may directly or indirectly affect young farmers' motivations to be a farmer. The square shapes, on the other hand, correspond to constructs reflecting exogenous factors (i.e. factor-based approaches) which, according to Fischer and Burton (2014), their influence on young farmers' incentives to stay in the farm depends on the nature of the endogenous cycle. Finally, the double line oval shape is a construct that reflects young farmers' incentives to leave farming. In this framework, this construct is considered as the dependent variable.

It is important to clarify that this framework is generic in the sense that it shows all the potential relationships between the constructs because, to the best of our knowledge, there are no studies indicating which of these links exist in real life. In order to identify existing relationships, the structural modelling technique was adopted. This is explained in the next section.

### 3. Methodology

In order to obtain quantitative data for the constructs of the theoretical framework and to determine significant relationships between these constructs, a questionnaire based on 5-points Likert scale was designed. The sampling technique adopted in the research corresponds to the snowball sampling technique. According to Salganik and Douglas (2004), this technique consists of selecting respondents from the friendship network of existing members of the sample. The sample process starts when the researcher selects an initial small number of respondents referred to as *seeds*. After that, the seeds recruit others to participate in the study, and this process of existing sample members recruiting future respondent members continues until the size of the sample selected for the investigation is reached.

The snowball technique adopted in the current research follows a similar approach to that adopted by Morais et al. (2017), who undertook closely related research. In particular, the current investigation used several seed farmers located in different relevant UK counties in order to cover a range of different geographical areas. The farmers who accepted to participate in the study were invited to complete an online survey. Using this approach, 287 young farmers responded to the

questionnaire. However, some of them omitted key questions and were not included in the sample. As a result, a sample of 255 young farmers was obtained.

The information extracted from the questionnaire was used to obtain measurements for the constructs of the theoretical framework. These measures correspond to 5-points Likert scale statements (1: Strongly disagree; 2: disagree; 3: indifferent; 4: agree; 5: strongly agree) and are presented in Table 1 (profile questions are shown in Appendix A). The rationales for these measures are explained as follows.

Let us first consider the endogenous factors of the theoretical framework. In the case of the construct *construction of successor identities* (CSI), two statements were selected. Following the theoretical arguments considered by the endogenous successor cycle model, these statements capture the importance that young farmers attribute to the family tradition and the farming community as a way to create successor identity. For the construct *involvement progression* (INP), general statements informing about the degree of involvement in the farm and the ability to make decisions such as exploring new activities were considered. For the construct *sense of control over the farm* (SCF), four statements were including that inform about the knowledge that young farmers have about the stability of the farm and the ability to control the business. Finally, for the construct *young farmer motivation* (YFM), five statements were considered. They inform about possible goals that are relevant for the young farmers, including both economic and social goals.

In the case of exogenous factors, the construct *beliefs about the farming sector* (BFS) was measured by means of two statements reflecting negative beliefs in relation to the sector that may encourage young farmers to leave the farm. In the case of the construct *beliefs about policy support* (BPS), two statements were including to explore how negative beliefs about support may affect young farmers' incentives. One of them captures the own opinion of young farmers, and the other captures the influence of the opinion of neighbours in relation to policy support. Finally, the construct *beliefs about the young payment* (BYP) was measured by means of 11 statements reflecting different possible meanings that young farmers may attach to this payment.

The last construct considered in the theoretical framework is *intention to leave the farm* (ILF). As explained above, this is the dependent



**Table 1**  
Constructs and measurements of the theoretical model.

Constructs	Variables	Description of question
CSI	CSI_1	It is important to be part of the farming community
	CSI_2	I try to maintain the family tradition
INP	INP_1	I like to try new things on my farm
	INP_2	Keeping the farm up to date is very important to me
	INP_3	I take risks more often than other farmers
	INP_4	Administration tasks take up a lot of time on my farm
SCF	SCF_1	My home farm is currently in a healthy financial condition
	SCF_2	Off-farm income is important for sustaining our farm
	SCF_3	My farm currently produces above-average yields
	SCF_4	I am well informed on the relevant legislation for my farm
YFM	YFM_1	I always aim to achieve an income as high as possible
	YFM_2	I enjoy my work
	YFM_3	Have sufficient time for leisure
	YFM_4	I value recognition and prestige as a farmer
	YFM_5	I try to be among the highest producing farms
BFS	BFS_1	The future of the farming sector is very uncertain
BPS	BFS_2	Low profit levels would prevent me staying in the farming industry
	BPS_1	Agriculture should not need to be supported by public subsidies
BYP	BPS_2	Neighbouring farmers could resent the idea of additional subsidy to young farmers
	BYP_1	The young farmer payment would make me feel more secure in my role
	BYP_2	The young farmer payment would improve my quality of life
	BYP_3	The young farmer payment would increase the stress levels experienced by young farmers
	BYP_4	The young farmer payment would influence my decision to remain in farming
	BYP_5	The young farmer payment would encourage greater variety of cropping and stocking
	BYP_6	The young farmer payment would offset the risk and uncertainty in the farming sector
	BYP_7	The young farmer payment would be too small to keep me in farming
	BYP_8	The young farmer payment would lead to more environmentally-friendly farming practices
	BYP_9	The young farmer payment would allow me to improve the productivity of the farm
ILF	BYP_10	The young farmer payment would increase my motivation to succeed in the farming industry
	BYP_11	The young farmer payment would not compensate for the high levels of debt on my farm
	ILF_1	I am planning to leave the farm in the near future
	ILF_2	Uncertainty about the future of farming will make me consider an alternative career path

variable in this framework and was measured by means of two statements reflecting young farmers' willingness to give up farming.

Significant constructs and interactions between them were identified by means of the Structural Equation Modelling (SEM) technique. This method is defined by Hair et al. (2013) as a second generation multivariate method that aims to relate data and theory where prior knowledge is incorporated into an empirical analysis. The SEM combines observable and latent variables by considering two models referred to as *measurement* and *structural* models. The measurement model defines and specifies the relationships between the observable and latent variables or constructs and their indicators. The structural model, on the other hand, describes potential relationships between the latent variables.

The type of SEM adopted in this study is the Partial Least Square (PLS-SEM). This approach is more appropriate to predict the dependent latent variables of the model by maximising the explained variance ( $R^2$ ). The main advantages of this approach are that it allows for exploring possible relationships between constructs and it does not require samples with normal distribution (Pavlou and Chai, 2002; Dibbern et al., 2004; Reinartz et al., 2004; Esposito Vinzi and Russolillo, 2010; Hair et al., 2013; Rodríguez-Entrena et al., 2013 Henseler et al., 2016). In considering these advantages, the PLS-SEM approach was adopted for two reasons. Firstly, the interactions between the construct of the theoretical framework are unknown, and consequently, an exploration of the possible relationships is required. Secondly, as explained above, the sampling method used in the study corresponds to the snowball technique, and since the resulting sample is not perfectly random, the PLS-SEM is the most appropriate method for this research.

An important limitation of the study is that the results cannot be generalised because the sample is not normal. However, given the difficulty in finding normal samples in agriculture, the PLS-SEM offers an interesting analytical tool for this sector.

## 4. Results

This section reports the results obtained from the questionnaire. It starts describing the profile and main characteristics of the sample. After that, the results of PLS-SEM approach are presented in the three steps followed in the study: fitting results of the measurement model; fitting results of the structural model; and total effect results.

### 4.1. Sample profile

The farmers age in the sample was on average 22 years old (SD = 3.9). Regarding the level of education in relation to the UK system, 54% of these farmers had an A level, 28% had an undergraduate degree, 15% had a General Certificate of Secondary Education (GCSE) or equivalent, and the rest had other studies. In terms of the role in the farm, most of the young farmers were family members (65%) and farm workers (24%). The main farm types where these farmers worked corresponded to mixed agriculture (26%), dairy (24%), cereals (19%), and Lowland grazing livestock (14%). Fig. 2 shows the geographical distribution of the farmers in the sample.

### 4.2. Results from the PLS-SEM approach

This section reports the results obtained from the PLS-SEM approach and are presented in the three steps followed in the study: fitting results of the measurement model; fitting results of the structural model; and total effect results. Descriptive statistics of the variables that were found significant by the PLS-SEM model are summarised in Table 2.

#### 4.2.1. Fitting results of the measurement model

The measurement model generated by the data shown in Fig. 3 describes how each latent variable is explained by the observable variables or items. In order to determine whether the constructs and

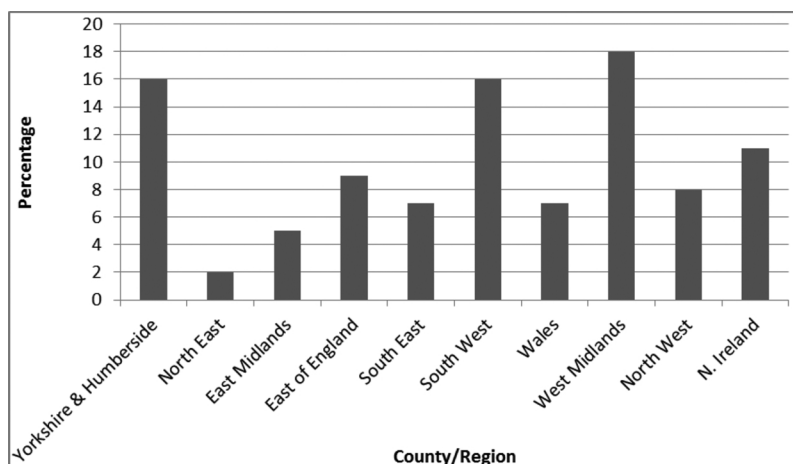


Fig. 2. Geographical distribution of the Young farmers in the sample.

**Table 2**  
Descriptive statistics of key variables.

Constructs	Variables	Mean	Standard deviation
CSI	CSI_1	4.31	0.67
	CSI_2	3.89	0.93
INP	INP_1	3.91	0.82
	INP_2	4.04	0.81
SCF	SCF_3	3.35	0.95
	SCF_4	3.46	0.95
YFM	YFM_2	4.40	0.61
	YFM_4	3.95	0.78
BFS	BFS_1	3.74	1.01
	BFS_2	3.27	1.13
BPS	BPS_1	2.66	1.36
	BPS_2	2.84	0.96
BYP	BYP_1	3.55	0.89
	BYP_2	3.56	0.92
	BYP_9	3.63	0.86
	BYP_10	3.53	1.03
ILF	ILF_1	2.17	1.08
	ILF_2	3.04	1.24

their items in this model are consistent, they have to satisfy minimum conditions of validity and reliability.

Table 3 summarises the results related to the verification of the internal consistence of the indicators of each construct, the Composite Reliability (CR), and the convergent validity corresponding to the Average variance extracted (AVE). The values in the table ensure that approximately 50% of the variance ( $\lambda^2$ ) of the observed variable is shared by the construct, the observable variables measure the latent variable, and the construct shares more than 50% of the variance with its indicators. On the other hand, the Fornell–Larcker discriminant validity criterion revealed that the constructs measure different concepts (Cepeda and Roldán, 2004; Hair et al., 2013).

#### 4.2.2. Fitting results of the structural model

The structural model is the one that shows the relationships between independent and dependent variables. In order to obtain an appropriate interpretation of the behavioural model, it is necessary to carry out an evaluation of the structural model. This consists of determining the path coefficients ( $\beta$ ) and their corresponding  $t$  values, the explained variance ( $R^2$ ), and the predictive relevance ( $Q^2$ ). The path coefficients or standardised weights of the regression ( $\beta$ ) measure the strength of the relationships between the constructs.

According to Fig. 4, the  $t$  values (estimated by means of the bootstrap method, see Varian, 2005) of the regression coefficients between the constructs or latent variables are highly significant at the 95% significant level. As a result, ten relationships of the theoretical

framework in presented in Fig. 1 are verified.

On the other hand, Table 4 shows that the construct *Attitudes towards farming* is the one with the highest contribution to the variance percentage of the factor *intention to leave the farm*, and the model overall explains 43.14% of this variance.

To evaluate the predictive relevance of the model, a procedure referred to as Blindfolding is carried out to obtain the index  $Q^2$  (Tenenhaus et al., 2005). The results presented in Table 5 are all positive, meaning that the predictive relevance of the model is satisfied.

On the other hand, the value of  $R^2$  corresponds to the fraction of variance of a variable that is explained by the dependent constructs. The acceptance minimum limit for this value is 0.1, because lower values have a low predictive level (Falk and Miller, 1992). Table 5 shows that the three constructs have a high  $R^2$  implying that a high percentage of the variance is explained by the model.

In summary, the measurement model has satisfactory psychometric properties that validate the estimation of latent variables as the validity and reliability criteria are both satisfied. On the other hand, the structural model shows statistically significant relationships which correspond to ten of the possible relationships described in the theoretical framework presented in Fig. 1. Finally, the predictive relevance is satisfied and the values of  $R^2$  are over the minimum acceptable limit for the explained variance of the model.

#### 4.2.3. Total effect

Table 6 shows the total effect that each construct has on the factor *intention to leave the farm*. The construct *beliefs about the farming sector* is the one with the highest effect. This is nearly twice the effect of *beliefs about policy support*. The incidence of the other constructs is negative and significant implying that these constructs have a negative effect on intention to leave the farm. Among them, the *young farmer motivation* construct is the one with the highest effect. According to the information presented in this table, if the factor *Beliefs about the farming sector* increases by one unit, then *intention to leave the farm* will increase by 0.571 standard deviations. Similar interpretations apply to the other constructs.

### 5. Discussion and conclusions

Having described the results obtained from the PLS-SEM approach, let us focus now on the implications of the findings. For this purpose, Fig. 5 which provides an alternative representation of the models depicted in Figs. 1 and 4. It shows the specific statements that form part of the constructs, the significant links between these constructs, and the effect (positive or negative) that a construct has on another when they are linked. As in Fig. 1, the oval shapes represent the constructs that

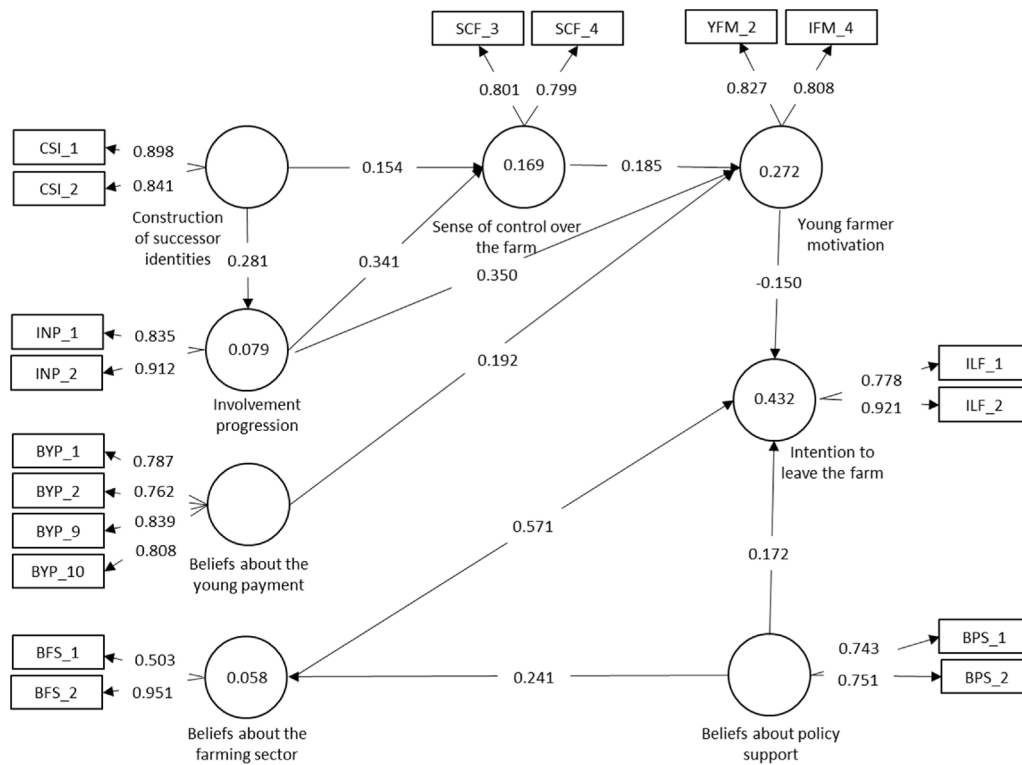


Fig. 3. Measurement model showing the path  $\beta$  coefficients between the constructs.

Table 3  
Indicators of the measurement model.

Construct	Indicator	Individual reliability Loading $\lambda$	AVE	CR
Beliefs about the young payment (BYP)	BYP_1	0.787	0.639	0.876
	BYP_2	0.762		
	BYP_9	0.839		
	BYP_10	0.808		
Involvement progression (INP)	INP_1	0.835	0.766	0.867
	INP_2	0.913		
Construction of successor identities (CSI)	CSI_1	0.898	0.757	0.780
	CSI_2	0.841		
Intention to leave the farm (ILF)	ILF_1	0.778	0.727	0.862
	ILF_2	0.921		
Young farmer motivation (YFM)	YFM_2	0.827	0.699	0.801
	YFM_4	0.808		
Beliefs about the farming sector (BFS)	BFS_1	0.503	0.579	0.715
	BFS_2	0.951		
Sense of control over the farm (SCF)	SCF_3	0.801	0.640	0.780
	SCF_4	0.799		
Beliefs about policy support (BPS)	BPS_1	0.743	0.558	0.716
	BPS_2	0.751		

reflect the endogenous succession cycle model, the square shapes represent exogenous factors, and the double line oval shape is a construct reflecting young farmers’ incentives to leave the farm.

This quantitative assessment is consistent with the endogenous succession cycle model proposed by Fischer and Burton (2014). The construction of successor identities process, captured in Fig. 5 by the construct construction of successor identities (CSI), shows that young farmers who care about family tradition and being part of the farming community are more involved in farming activities that requires innovation and decision making. This is revealed by the positive effect of the construct CSI on the construct involvement progression (INP) which includes both the progression on the farm ladder and the development of the farm business trajectories processes of the endogenous succession cycle model. The constructs CSI and INP, in turn, positively affects the

construct sense of control over the farm (SCF) meaning that young farmers who have successfully created a successor identity and who have progressively assumed farm activities that requires levels of decision making are more aware of the actual productive and legal situation of the farm.

In relation to motivations, the quantitative assessment revealed that the construct young farmers’ motivations (YFM) are positively influenced by INP and SCF. This means that increasing involvement with farm activities and decision making, and having more control over the farm in terms of knowing the current situation of the farm positively affect young farmers’ enjoyment at work and allow them to obtain recognition and prestige. Finally, a farmer who is more motivated in terms of enjoyment and prestige is less willing to leave the farm which is what explains the negative relationship between the constructs YFM and intention to leave the farm (ILF).

According to Fischer and Burton (2014), the influence of ‘factor-based’ approaches (i.e. exogenous factors) on young farmers’ incentives to leave the farm depends on the current state of the endogenous succession cycle. That is, these factors would be stronger in preventing succession when some of the processes of the cycle are weak or broken. Our results confirm this claim. For example, a change in the Likert scale values assigned to the statements in the construct CSI in Fig. 3 would certainly affect the path  $\beta$  coefficient between the constructs YFM and ILF. What is discovered in our quantitative assessment is that it describes the ways by which exogenous factors influence young farmers’ incentives to leave. To see this, we consider three different exogenous factors: beliefs about the farming sector (BFS); beliefs about policy support (BPS); and beliefs about the young farmer payment (BYP), which is the focus of this article.

The construct BFS directly affects young farmers’ incentives to leave (ILF) and is the most influential in terms of the path  $\beta$  coefficient between constructs that are directly linked to ILF (i.e. 0.571 in Fig. 3). It is composed of statements reflecting pessimistic beliefs in relation to the farming sector. This suggests that even when young farmers are highly motivated, economic conditions that negatively affect the farming sector can reinforce the decision to leave the farm. On the other hand,





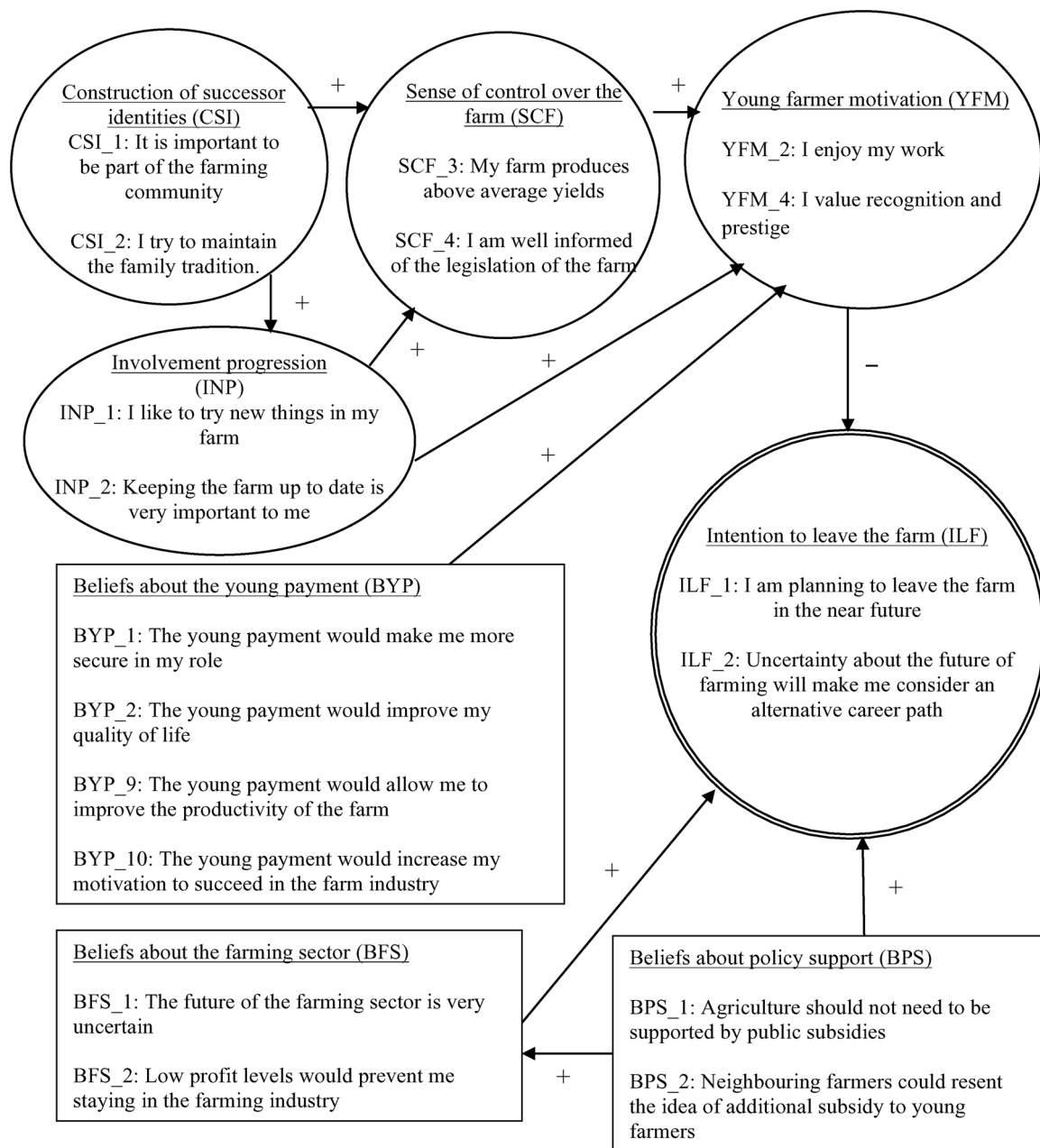


Fig. 5. Behavioural model based on the endogenous succession cycle approach.

motivation, quality of life, and farm productivity. This construct positively affects the construct *young farmers' motivation* (YFM) implying that farmers who agreed to the positive beliefs associated with the young payment perceived this payment as a tool to achieve motivational goals such as job enjoyments and recognition. In other words, and contrary to what it was expected, the young payment was not only perceived as an economic incentive, but as a means to achieve non-economic goals.

This finding has an important implication, that the YFM construct corresponds to a mediating variable between the payment and young farmers' incentives to leave the farm, suggesting that the effectiveness of this support may potentially be reinforced by attaching motivational meanings to the payment. This can be illustrated from the fact that the young payment was available only to qualified farmers. This suggests that farmers who obtained the payment gained recognition and prestige with respect to their reference group and, therefore, they were less willing to leave the farm.

The results have also an important implication for policymakers. That is, policies based on payments given to young farmers may not work if they are not aligned with key social and psychological behavioural drivers. The reason is because the young farmer payment was not the strongest factor affecting farmers' motivations and willingness to leave the farm. For example, leaving the farm would still be the preferred choice of too pessimistic young farmers who are strongly influenced by the negative opinion of relevant neighbours. Likewise, a payment may not be adopted if young farmers feel that they do not form part of the farming community.

In considering both the motivational effects and the limitations of the young payment described above, it is argued in this article that a payment given to young farmers to prevent them from leaving the farm could be an option for other countries. However, they should be accompanied with additional complementary strategies. The aims of these strategies would be to reduce pessimism, favour community and family integration, facilitate the integration of young farmers into the business'

decision making, and attach the payment to the notion that this is not only an economic incentive, but also a tool that can facilitate the achievement of motivational goals. Major barriers that should be addressed in order to provide a strategy package of this nature are the

problems of farm succession and the lack of credit access to young farmers. Specific formulas to deal with these barriers are left for future research.

**Appendix A**

*Profile questions*

1. Is there an opportunity in the future for you to take over as 'head of holding'?

Yes	No	I don't know
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2. Are you Male or Female?

Male	Female
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3. In what year were you born? (enter as yyyy)

4. Please indicate your highest level of educational attainment to date

GCSE or equivalent	A level or Further Education equivalent	Degree	Postgraduate	Other
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5. If you work or live on a farm, please choose your location from the following list of Regions

Yorkshire & Humberside	North East	East Midlands	East of England	South East	South West	Wales	West Midlands	North West	N. Ireland	Other
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6. If you work or live on a farm, what is the MAIN farm type?

Cereals	Dairy	General cropping	Mixed	Pigs/Poultry	LFA grazing livestock	Lowland grazing livestock	Other
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7. If you work or live on a farm, how many hectares of land do you actively farm?

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