Uptake of Environmental Schemes: An analysis of the farm business survey 2016-2021

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Research Brief: Ensuring positive behavioural change for farmers towards best practice for clean growth (Project B3-1): SRUC-B3-1

Uptake of Environmental Schemes: An analysis of the farm business survey 2016-2021

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Summary

Agricultural transition is a key pillar of Scotland's post-Brexit framework for support of farmers. The proposed support framework outlines a greater commitment to reward environmental benefits in line with food production. Understanding why some farmers choose to commit to greater environmental enhancement will be of increasing interest to policy makers who wish to embed nature based and climate enhancing goals within future support policy.

We use the Farm Business Survey (FBS), for the period 2016-2021, and aggregate environmental payments (these cover such aspects as farmland management options, such as management of woodland and wetland). We explore uptake of environmental payments per standard labour requirement against a number of variables between 2016-2021.

- Around 60% of the farms in the FBS have received some environmental payment under pillar 2 but there are wide variances in payment across SLR within farms of the whole FBS cohort.
- Indicators of innovation, information seeking and farm tenancies are drivers of high environmental payments per SLR on farms.
- Farm family life cycle factors have an influence, though succession plans tend to focus on embedding agricultural production, whereas as the farmers reach planned retirement, they tend to increase the intensity of environmental payments.

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1.0 Introduction

Agricultural transition is a key pillar of Scotland's post-Brexit framework for support of farmers. The proposed support framework outlines a greater commitment to reward environmental benefits in line with food production[1]. Whilst there are financial factors to encourage engagement with environmental schemes, there is a large literature which emphasises the range of other factors that would determine uptake, these include the ability of the farm to accommodate environmental schemes as well as other family related factors. Understanding why some farmers choose to commit to greater environmental enhancement will be of increasing interest to policy makers who wish to embed nature based and climate enhancing goals within future support policy.

2.0 Method

The Farm Business Survey (FBS) collects detailed financial and production related data for a set of farms in Scotland. The depth of the survey offers an understanding of the financial performance of farms over time. Whilst the sample has declined over this period there is an average of 480 farms across the 2015-2021 timeframe.

Our key indicator of uptake is the environmental payments received. These relate to environmental activities funded under Pillar 2 payments to the farm and breakdown into a series of detailed payments. For statistical estimation we take the aggregated value of payments to all environmental related payments, these cover farmland management options, such as management of woodland and wetland, as well as organic options. To account for size of the business we adjust for standard labour requirements, which is a proxy indicator for capacity of the business. This indicates the intensity of environmental payments per SLR.

3.0 Results

3.1. Distribution and change in payments

Figure 1 shows a quantile plot which indicates the distribution of payments across the sector. This includes those farms who received no payment and provides an indication of the spread and size of payments in the sector. This merges the 6 years of data and shows that, of the sample around a half received little or no payment against these categories.

[1] See: https://www.gov.uk/government/publications/agricultural-transition-plan-2021-to-2024/agricultural-transition-plan-update-january-2024

Figure 1 shows the distribution of payments for the farms over the 6 year period as a 'quantile' plot. This shows the fraction of farms receiving payments and adjusts them for size using standard labour requirements. Overall, around 40% of the farms recorded 0 payments, but the remainder show a widespread with outlier farms receiving payments of between £10-30 per SLR.

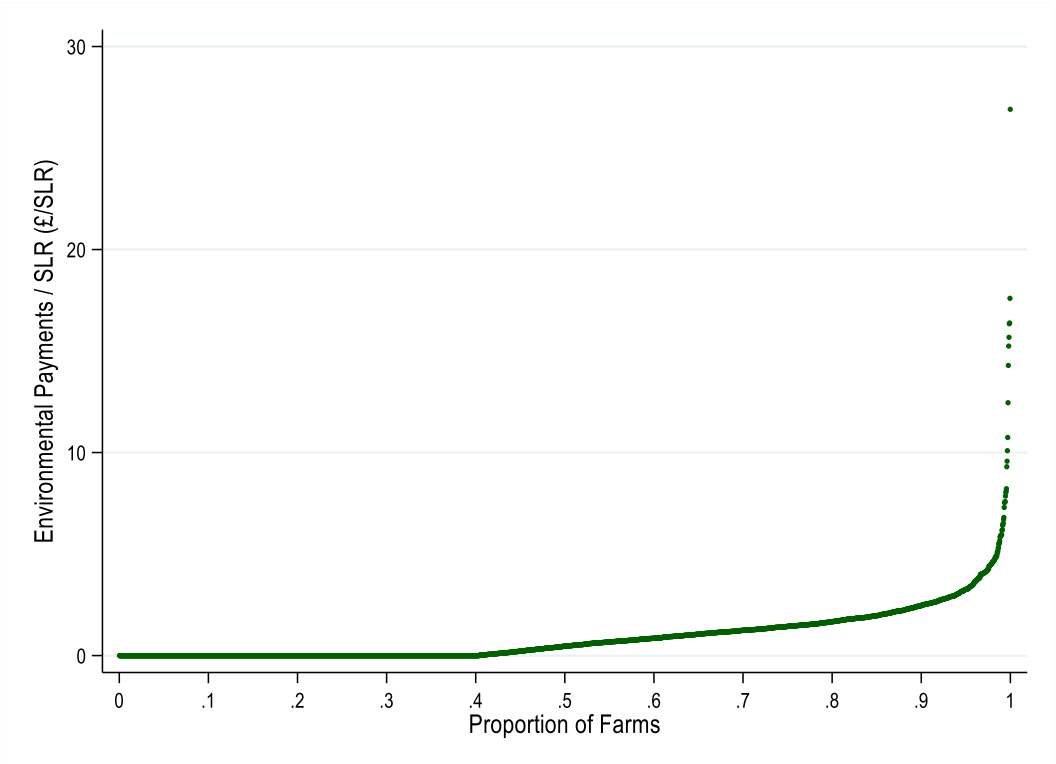

Table 1 shows the payments by year for those who received payments only. This shows an average payment of £1.6 per SLR but with large variances across the farms. The table also shows the percentage of farms within the FBS receiving an environmental payment.

Year	£ Env Payment/SLR			
	N	Mean	SD	% farms
2016	290	1.718	1.159	57%
2017	286	1.518	1.341	58%
2018	294	1.609	1.966	60%
2019	290	1.753	1.816	60%
2020	255	1.611	1.853	61%
2021	255	1.327	1.780	64%
Total	1,670	1.595	1.677	

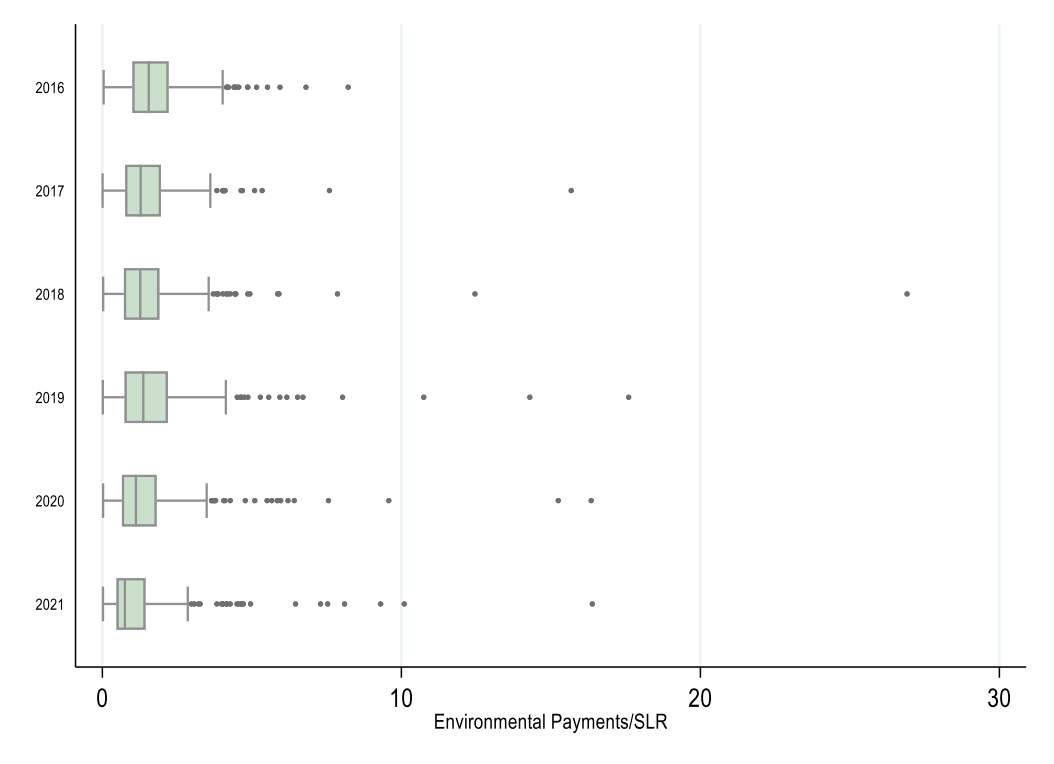

Figure 2 shows the distribution of payments across the years, whilst it shows a median of around £1.25 /SLR but with a wide upper limit. These show a small number of farms receiving between £10-£20/SLR with a payment in 2018 of £28/SLR.

To explore these outliers further we explored the top 1% of recipients and examined whether they were different. Overall, this covered 27 observations but tended to be between 2-7 farms per year. Using a test of significance between the two we found there were significant differences between these farms and tenure (higher numbers under mixed tenancies), attendance at group discussions (higher attendance), and in organic (higher numbers fully organic). Though these represent small numbers and comparative results must be viewed with caution.

3.2. Drivers of Uptake of Environmental Scheme Participation

Given the divergence in environmental payments we categorised the payment data into three categories, namely those farmers receiving no payments, those receiving payments lower than the median payment (£1.24), and those receiving higher than the median. As these categories are progressive, we employ an ordinal logistic regression model[2].

We selected a range of variables of interest, based on a literature search and reviews of uptake of environmental scheme data. The FBS offers a range of farm level information, including age, gender of main decision maker and plans for succession. Moreover, other indicators such as information seeking, around group engagements as well as software and internet use are available. In addition, some indicators give proxies for innovation such as investment in smart equipment. The results of the ordinal regression are shown below. These are presented as odds ratios. An odds ratio above 1

[2] This assumes that the categories follow an order, in our case it reflects the higher level of payment per SLR.

indicates a positive influence on increased environmental payments to SLR, whereas below 1 indicates a negative influence.

Table 2. Results of the ordinal regression, where 0= no participation, 1=below median payment for environment, 2=above median payment for environment.

	Odds ratio	p.	Std. err.
Size (Ref: Small ESU<8)			
Medium (ESU >=8-16)	1.480	-	*(0.449)*
Large (ESU >=16)	0.998	-	*(0.272)*
Expenditure on Smart Equipment	1.014	-	*(0.158)*
Tenure (Ref: Owner-Occupier)			
Tenanted	1.449	**	*(0.162)*
Mixed	1.197	*	*(0.109)*
Has Agricultural Education	0.706	***	*(0.061)*
Expenditure on Software for Farm	1.251	*	*(0.118)*
Group Membership (Reference:No Engagement)			
Single Group Membership	0.994	-	*(0.091)*
More than 1 Group Membership	1.511	**	*(0.208)*
Use internet for Information Seeking	0.928	-	*(0.084)*
Identified a Successor	0.769	**	*(0.065)*
Within 10 yrs of retirement	1.281	**	*(0.113)*
Organic	3.422	***	*(0.888)*

* p<0.05, ** p<0.01, *** p<0.001

The estimates show the influence of various key characteristics leading to higher levels of intensity in environmental payments per SLR. For example, expenditure on software is a proxy for managerial behaviour and a one unit increase in expenditure would lead to an expected 1.3 increase in odds of being part of a more environmentally intensive group.

Similarly, membership of groups is a proxy for information seeking, and those farmers who engage in more than one group are far more likely (1.5:1) to have a greater environmental payment to SLR than those with no membership of groups. Tenancy is a key driver, with both those on mixed and pure tenancy agreements have log odds higher than 1 which shows higher expectation of more intensive participation than owner occupiers.

A number of variables, including size, expenditure on smart equipment, which is a proxy for innovative adoption behaviours, were not significant. As an indicator of farm family life-cycle

events, the identification of a successor has an odds ratio below 1 and leads to lower environmental intensity than if farms have not identified a successor. This may be related to an increased focus on agricultural activity to prepare the farm for handover under a succession plan. Conversely as farmers approach retirement there is a higher expectation of participation. Finally, those farms which are fully organic or undergoing conversion, compared to non-organic farms, have an odds ratio higher than 1 which will infer a higher intensity of environmental payments, however it is notable that those who are registered organic within the FBS are very small, e.g. roughly about 2% of the sample.

4.0 Summary

- We apply the Farm Business Survey and explore uptake of environmental payments per standard labour requirement against a number of variables between 2016-2021.
- Around 60% of the farms in the FBS have received some environmental payment under pillar 2.
- There are wide variances in payment across SLR within farms of the whole FBS cohort.
- Indicators of innovation, information seeking and farm tenancies are drivers of high environmental payments per SLR on farms.
- Farm family life cycle factors have an influence, though succession plans tend to focus on embedding agricultural production, whereas as the farmers reach planned retirement, they tend to increase the intensity of environmental payments.

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Annex. List of Environmental Schemes

We selected the following codes based on the range of options where there were entries and offering a large enough sample for analysis.

PILLAR_2_CODE	PILLAR_2_NAME
SRAF	Agroforestry
SRCI	Targeted capital Items
SRCS	Non targeted capital items which can stand-alone
SRFH	Farmland habitat and features options
SRFI	Forest Infrastructure
SRGO	Grassland options
SRLS	LFASS
SROO	Organic options
SRPA	Public access options
SRTH	Tree Health
SRUO	Upland, peatland, moorland and heath options
SRWI	Woodland improvement grant
SRWO	Wetland & bog options
SRWP	Woodland Creation
SRWQ	Managing water quality and flood risk options