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Barriers to increasing productivity on upland farms

JEREMY FRANKS¹, CHARLES SCOTT², ELLIOT TAYLOR³, JAMES STEELE⁴ and CATHERINE MAUGHAN⁵

ABSTRACT

This study reports the impacts of resource constraints on upland farms in England. The majority of respondents (105, 85%) reported one constraint, 65 (52%) reported two. “Land- and tenure-related issues” was reported by 44 (42%); “personal and family related issues (including succession)” by 18 (17%); “poor cash flow and low profitability” by 17 (16%); and “general uncertainty regarding Brexit” by 16 (15%). The main impacts included reduced profitability (30 respondents), lower stocking rates (17) and investment (12), and problems managing livestock (9). Only five respondents reported that the bottleneck created by these constraints motivated the development of their business. The majority of respondents wanted direct payments to remain and there was support for grant schemes targeted at upland farming (25). However, 58 (48%) believed they could not remove their constraint without assistance, though few suggested innovative policies or instruments. The findings suggest that a farmer’s willingness and ability to adapt to changes in policy and support payments will be the most important factor in determining which upland farms continue in business after the UK has left the European Union.

KEYWORDS: upland farming; resource constraints; bottlenecks; farmer survey; productivity

1. Introduction

Businesses use inputs, such as labour, land and water, to create outputs, and add value in the process. The efficiency with which this transformation occurs depends on the types and combinations of inputs used. Businesses which achieve the perfect balance between, and optimal levels of inputs, so that each is fully utilised, are the most economically efficient. However, a shortage of one input can create a bottleneck which prevents other inputs being fully utilised. This reduces the productivity of the farm, which lowers its profitability.

Resource shortages constraint farming systems by creating bottlenecks which lower farm productivity. It is because bottlenecks have an adverse effect on the industry’s international competitiveness that the barriers to their removal are of interest to policy makers. Total factor productivity (TFP) measures the ratio of outputs to inputs, therefore it measures the rate at which all inputs are converted into output. TFP and annual labour productivity (ALP, measures the ratio between farm output and the single input, labour) in the agricultural and horticultural sector have levelled off in recent years (Defra, 2019c), and the rate of TFP growth has fallen behind comparative countries:

“The rate of growth in TFP in the UK [agriculture and horticulture sectors] has fallen behind that of many of our major competitors, averaging 0.9 per cent per year as opposed to 3.5 per cent in the Netherlands, and 3.2 per cent in the USA” (AHDB, 2018: p 3).

Newly calculated data shows that TFP of upland LFA grazing livestock farms has:

“Decreased by 9% from 1990/91 to 2017/18. The decrease in productivity is largely driven by an increase in the volume inputs (9%), while there has been no increase in the volume of outputs over the period” (Defra, 2019b: p 12).

It is in part because Defra believes that direct payments “undermine efficiency and productivity growth” (Defra, 2018a: p 3) that it supports their withdrawal and to use a proportion of the funds released for the provision of public goods, despite acknowledging that these changes will increase the rate of restructuring, that is, force farms out of business (Defra, 2018b). However, one way the adverse impacts of structural change can be lessened is by tailoring support instruments to help

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¹ Corresponding author: Newcastle University. E-mail: Jeremy.Franks@newcastle.ac.uk

² Newcastle University.

³ George F White (Farm Business Consultants).

⁴ Newcastle University.

⁵ Newcastle University.

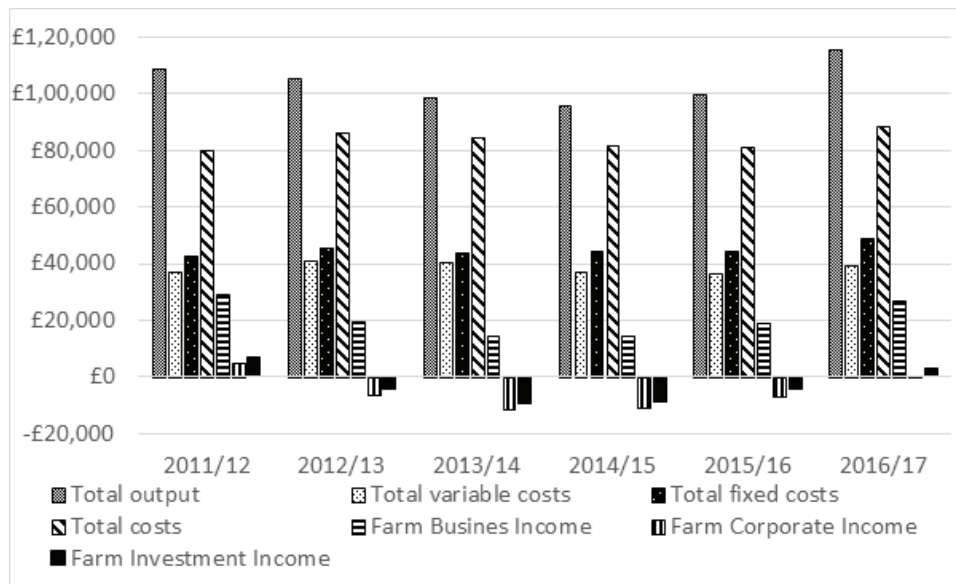


Figure 1: Upland Grazing Livestock Farms performance: full FBS sample, raised data. (£) (Source: derived from Harvey and Scott (various)).

farmers raise productivity. To allow it to give targeted assistance, Defra needs to know the key resource constraints farmers face, the impacts these constraints have on farm productivity, and the barriers to their removal. This study aims to answer these questions for upland farm businesses in England. A survey of 124 upland farmers in England identifies their most limiting resources, the bottlenecks the resource constraints create and their impacts on the farm business, and the policies respondents believe would be most effective in helping to remove their bottlenecks.

The paper is structured as follows. The next section describes the typical resources available to upland farmers, and presents recent trends in the profitability of upland farms. Section 3 reports the methodology used in the survey, discusses respondent's understanding of the concept of resource constraints and bottlenecks, and presents details of the questionnaire and summary statistics of respondents. Section 4 reports the primary constraints, summarises the impacts of these constraints on the farm business, lists the barriers to their removal, and summarises the policy interventions respondents believe would most help them to remove the bottleneck. Section 5 discusses the research findings, and Section 6 concludes.

2. Background to upland farming systems in England

2.1 Agricultural and environmental characteristics of upland farms

Farms are classified as upland farms if they have at least 50% of their total area in a Less Favoured Area (LFA). In England some 2.2 million ha of land is classified as LFA, 1.8 million ha of which is in agricultural production (which is approximately 17% of the total agricultural land in England (DEFRA, 2008c; Defra, 2008a)). The natural characteristics of these areas, their geology and altitude, allow a restricted range of agricultural activity, predominately sheep and cattle grazing (EFRA Committee, 2011). These characteristics, together with a generally poor climate and the distance from large urban

markets makes it difficult for these farms to compete with lowland farms.

However, the uplands are nationally and internationally important for biodiversity, contain significant landscape, archaeological, recreational, heritage, and natural resource value, and contribute to cultural diversity.⁶ For these reasons, and because upland farming has important implications for the economic, social and environmental sustainability in these areas (IEEP/LUC/GHK, 2004; Midmore and Moore-Colyer, 2005), governments have supported policies that support upland farming (Wathern *et al.*, 1986; DEFRA, 2008b). Examples of bespoke policies include the Hill Livestock Compensatory Allowance (introduced in 1975), the Moorland Scheme (1995) and Hill Farming Allowance (HFA) (2001) (DEFRA, 2006). In 2005 all existing schemes were replaced by the Single Payment Scheme (SPS) and Environmental Stewardship Scheme (ESS), with an Upland Entry Level Scheme opened in 2009. Further changes in 2015 introduced the Basic Payment Scheme payments and the Environmental Stewardship. And upland farmers can apply for grants under the Farming and Forestry Improvement Scheme and, more recently the Countryside Productivity Scheme (Redman 2018: p 152).

2.2. Profitability of upland farms

Figure 1 shows output value, input costs, and three farm income measures for upland farms in England between 2011/2 and 2016/7. Average Farm Business Income (FBI), which is Defra's preferred measure of farm income, decreased from £29,203/farm in 2011/12, to £14,640/farm in 2014/15, but increased in 2015/16 and reached £16,967 in 2016/17.⁷ However, FBI makes no

⁶For example; "The need for the continued presence of hill farming activities to maintain the upland environment is largely recognized and accepted by both environmentalists and farmers alike", and "The main economic rationale for public support for hill farming is to ensure the provision of public goods that would otherwise be under provided. The continuation of hill farming, in one shape or another, appears critical to maintaining and enhancing the environmental quality of the uplands" (IEEP/LUC/GHK 2004).

⁷This survey excludes any contribution to the farm household income from off-farm income, although the FBS acknowledges that off-farm incomes can be used to support farming activities and household, and hence would be expected to influence the rate of farm restructuring.

Table 1: Farm income by cost centres: upland farms in 2015/16 and 2016/17 (full FBS upland farm sample, weighted data)

Cost centre and measures of farm income	2015/16	2016/17
Agriculture	-10,771	-9,436
Agri-environment and other payments	9,779	11,199
Diversification out of agriculture	2,287	2,365
Single/Basic Payment	17,677	22,838
Farm Business Income	18,972	26,967
Farm Corporate Income	-6,754	295
Farm Investment Income	-4,568	2,875
Investment Income Net farm Income	9,761	16,615
Management and Investment Income	-11,681	-4,876

(Source: Harvey and Scott (2018))

Table 2: Respondents' understanding of the concept of bottleneck/primary constraint

Respondent had a clear knowledge of the farm's major system's constraint. (The farmer has clearly thought about prior to being asked the question).	Understood the concept of bottleneck, but respondent had not considered this question recently. (No ready answers were available to the questions; farmer needed time to reflect and consider).	Respondent was not aware of binding resource constraint concept.
64 (52%)	37 (30%)	12 (10%)
Number of complete responses		113
Number of incomplete responses		11 (8%)
Total		124

allowance for the “farmer and spouse labour and managerial input”.⁸ Defra imputes a reasonable values for these labour costs and subtracts them from FBI to produce Farm Corporate Income (FCI), which is, therefore, a closer estimate of profit as a businessperson or an informed layman would understand by the term. Figure 1 shows that FCI has been negative in each year between 2012/3 and 2015/6, with a positive value of only £295/farm in 2016/17. Low and negative FCI, stretching back of many years, reduces farmers' abilities to make the investments needed to replace wearing and worn equipment (Franks, 2006).

The FBS also reports financial performance by four costs centres. Table 1 shows that the average upland farm lost £10,771 and £9,436 from their traditional farming activities in 2015/16 and 2016/17 respectively. It also shows the important contributions agri-environment and the Basic Payment Scheme payments make to FBI and FCI.

3. Survey methodology and descriptive statics

The survey used in this research was completed by Farm Business Survey (FBS) co-operators. The FBS is an entirely voluntary survey which records financial and performance details from a randomly stratified sample of about 2,000 farms in England and Wales each year. In 2016/7, 217 of these farms were classified as upland farms. The survey was conducted in the spring and summer of 2017, participation aimed to recruit 50% of eligible farms, and was entirely voluntary. A total of 124 useable returns were obtained from

⁸ Farm Business Income (FBI) is defined to represent the return to all unpaid manual labour and management (farmer, spouse, farmer's family and others with an entrepreneurial interest in the farm business) and to all their capital invested in the farm business including land and farm buildings: it is Defra's preferred measure of farm income.

either face-to-face interviews or telephone surveys undertaken by trained FBS researchers.

The survey asked respondents to identify their main farm business objective over the next three years, to identify up to two constraints that are preventing them meeting their objective and the bottlenecks these constraints created. Respondents were then asked about the barriers they faced in removing the bottleneck, and to suggest policies and instruments which would most help them overcome the bottleneck.

3.1. Farmer's understanding of the concept of a constraint/bottleneck

Immediately after introducing the survey, each interviewer was asked to check that the farmer understood the concept of resource constraints, bottlenecks and the potential of bottlenecks to adversely affect farm performance. If respondents were not familiar with these concepts, the interviewer was required to discuss and explained it before starting the survey. The majority of respondents (64, 52%) understood the principle and had also recently considered this question. A further 37 (30%) understood the concept but had not considered it recently. Twelve respondents (10%) were not familiar with the concept and eleven awareness evaluations were not completed (Table 2).

3.2. Descriptive analysis of respondents (2016/17)

All of the surveyed farms were livestock farms (18 specialist beef (SDA), 42 mixed grazing livestock (SDA), 28 specialist sheep (SDA) and 36 various grazing livestock (DA)).⁹ The average age of respondents was

⁹ The uplands are subdivided into Severely Disadvantaged Areas (SDA) and Disadvantaged Areas (DA) in accordance with Article 19 of EC Regulation 1257/1999. About 70% of the uplands in England is classified as SDA, the remainder as DA (Defra (2008a)).

Table 3: Details of income by cost centre 2016/17, (agricultural, diversification, environmental and BPS payments) (N=124).

	Profit from agricultural production	Profit from diversification enterprises	Financial surplus from AES	Financial surplus from BPS payment
Average/farm	- 12,040	3,275	15,197	29,881
Max/farm	52,332	86,703	206,414	206,878
Min/farm	- 168,059	- 3,190	0	0
Standard deviation	30,101	9,802	25,045	26,170

68 farms received some form of diversification activity payment
104 farms received some form of environmental payment
All farms received a BPS payment

Table 4: Primary and second constraints (N=124)

	Primary constraint	Secondary constraint	Total
The primary constraint	(N)	(N)	(N)
Land (and tenure related) issues.	22	16	44
Farm buildings.	12	6	18
Personal and family related issues, including succession.	11	7	18
Cash flow and low profitability.	12	5	17
Brexit and uncertainty.	9	7	16
Staff related issues.	10	*	*
Access to, and affordability of capital.	10	*	*
Farming production issues relating to TB controls and general animal health issues.	7	*	*
Others include:			
<ul style="list-style-type: none"> • Tenure related issues • Restrictions imposed on farming practices by environmental schemes. • Commodity market (level and volatility) issues. • Geographically related constraint • Only received part of my BPS payment each year • The ability to develop new incomes streams to support the development of the farm • Red tape and paperwork 			
No primary/secondary constraint.	19	59	
Total responses.	124	124	
*Number withheld because responses below the minimum level for disclosure of 5.			
Responses to the question: what are the business's two most binding constraints/ bottlenecks which are preventing/hindering delivery of your declared business objective?			

61 (standard deviation 9.4 years) with an average of 25.9 years farming experience. Average FBI for the 124 farms was £36,115, with an average FCI of £7,327. Table 3 presents financial performance by four profit centres. It shows the importance of direct payment and agri-environment payment to farm profitability. The average net worth of the farms was £1,080,648.

4. Survey findings

Table 4 shows the primary and secondary constraints reported by respondents. Nineteen farmers stated they had no limiting constraint. The most commonly reported constraint was "land quality and tenure" (44).

Interviewees were asked to explain the impacts their primary constraint had on their farm performance. Their responses are summarised in Table 5 under two headings: "economic impacts" and "business development impacts".

The most frequently mentioned impact of the farmer's primary constraint was reduced profits (30), either

because the business had increased costs or reduced revenues. Seventeen said their primary constraint reduced the number of livestock on the farm, thus reducing productivity and profitability. Twelve said their constraint lowered investment, and nine that it had created problems managing livestock – all impacts which are likely to either increase costs or to reduce revenues, or both. These constraints will therefore have lowered agricultural production and therefore contributed towards the low and negative return from agriculture activities reported in Table 3.

Nineteen respondents said the constraint had hindered the development of their farm business. However, five said their constraint had forced them to change and evolve the business.

Table 6 presents the reasons farmers were unable to remove their bottleneck. Fifty-eight (61%) thought they could not remove the bottleneck created by their farm's primary constraint without external assistance, 31 (53%) blamed this on low profitability. The lack of cash, and,

Table 5: Impact of primary constraint (N=105)

Impact	(N)
Adverse economic impacts	
Low profitability (increases cost, lowers revenue)	30
Reduces the number of stock on the farm	17
Reduces investment in the farm business	12
Creates stock management problems	9
Adverse business development impacts	
Hinders the development of the farm business	19
Stimulated changes to the farm business	5
Others	
Farmers need to carefully manage their workloads	6
Other	8
Others include	
<ul style="list-style-type: none"> • Jobs not getting done • Impact not yet seen but expected shortly • Cannot benchmark performance • Demoralising for the farmer • Impossible to budget accurately 	

Table 6: Reasons why farmers were prevented from removing their primary constraint (N=95)

Barriers to removal of primary constraint	(N)
There is nothing an individual farmer can do	58
Low farm profitability – making costs of addressing the problem unaffordable	31
Others	6
<ul style="list-style-type: none"> • Lack of farmer time to address the issue • Limited by over farm resources • Difficulty finding reliable advice • It takes a long time to deliver genetic improvement 	
Total responses	95

in some cases inability to access capital, reduced or prevented investments thus holding back productivity.

Farmers gave many reasons why they are not able to remove their bottleneck without external assistance. For example, nine respondents cited labour issues that were outside their control, seven were unable to influence the area of farmland coming to market. Seven referred to the difficulties they faced overcoming personal health-related issues and inter-generational issues/disputes. Many respondents were unable to improve cash flow or to access additional capital. Policy-related issues, such as Brexit, were mentioned by seven. Others cited the burden of regulations, either those imposed upon them, such as TB restrictions, the legal framework underpinning Farm Business Tenancies, and local planning regulations, or those voluntarily entered into, such as organic regulations and agri-environment schemes, which were considered too inflexible by several respondents.

Although a wide range of policy interventions and instruments was suggested, they were, by and large, based on established policies and approaches such as grant schemes, changes in taxation regulations, targeted subsidised loans and reforms to tenancy legislation. Ten suggestions involved changes to the Basic Payment Scheme payment – including more prompt payment and

Barriers to increasing productivity on upland farms making its terms and conditions more favourable, no interviewee supported its removal. A few did suggest more innovative policies, such as support for share farming and farmer retirement schemes, support to help increase off-farm income, schemes that would reduce market price variability, and one respondent suggested schemes that prioritise conservation activities (such as specialist conservation grazing management schemes) at the expense of traditional livestock production.

5. Discussion

The majority of farmers understood the concept of resource constraints creating bottlenecks which adversely affected the farm's efficiency and productivity, which in turn reduced profitability. Of the 124 respondents, 105 (85%) reported at least one constraint, of these 58 (55%) believed they were of a structural nature which they could not remove without help, low profitability was the reason given by 31 (30%) for asking for some form of externally provided assistance.

5.1 Land quality

Perhaps not surprisingly given the characteristics of upland farming, the most commonly mentioned constraint was poor quality farmland. However, although it may be technical possible to improve land quality, for example by drainage schemes, it may not always make commercial sense to do so. And whilst such an improvement might increase farm output it may also exclude the farm from participating in agri-environment schemes. Where there is no business case for removing the constraint, farmers have little option but to accept and devise farming systems that minimise the impacts of the bottleneck on farm productivity.

5.2. Future support payments, and the balance between food and environmental outputs

The changes to agricultural policy proposed in the Agriculture Bill (2018) include phasing-out direct payments and introducing Environmental Land Management (ELM) systems (previously known as agri-environment schemes). These changes will offer additional support to environmental rather than traditional farm outputs. Responses to this survey suggest these changes will not meet with universal approval - even though analyses of the economic performance of upland farms show traditional farming activities to be loss-making activities. These analyses show that the majority of farms are financially reliant of the Basic Payment Scheme (Table 3), so its withdrawal is seen as a direct threat to the farm's survival.

Defra recognises these policy changes are likely to increase the rate at which farms cease trading,

“delinking [i.e. removing the link between Direct Payments and land] removes the need [for farmers] to farm the land so it may encourage those who chose to leave [farming] to accelerate this decision” (Defra, 2018b: p 45).

However, it supports the reforms because it believes that direct payments,

Table 7: Policy suggestions respondents believed would help them alleviate their primary constraint (respondents were allowed to suggest more than one policy) (N=111).

Policy instrument	(N)
Make grants available (including help with TB related costs and subsidies rural housing)	25
Suggestions related to Basic Payment Scheme payments	10
Provide training courses in practical livestock husbandry skills	7
Adjust the existing balance between food and environmental outputs	6
Change taxation regulations	6
Do not know	*
Others:	*
<ul style="list-style-type: none"> • Tenancy reform • Subsidised loans • Increase output prices (including improved lamb marketing) • Want a good trade deal • Change to planning regulations • Need to earn more off-farm income • Support share farming initiative • Support farmer retirement scheme • Provision of ADAS-type advice service • Reduce imports 	
No suggestions offered (including do not know)	35
*Number withheld because responses below the minimum level for disclosure of 5.	

Table 8: Policy measures identify as being innovative to the European CAP (Baker (2018))

Country	Policy measure
South Korea	Provides an agricultural pensions, which are often contingent on part-time farmers ceasing farming. Has created a successful high end horticultural sector by identifying areas with potential – in terms of soil, weather and access to markets – which are supported with focused interventions schemes.
Norway	Has a legislative limits to farm size (see also Forbord <i>et al.</i> , 2014)
New Zealand	In 2009 it established Land and Water Forum (LAWF) stakeholder group which consisting of farming representatives, NGOs, regional councils and indigenous right groups. Government set the 'what' - such as % reductions in e. coli in the water and a % of rivers that had to be swimmable by 2040 – and members of LAWF were tasked with agreeing a group consensus on the how (Land and Water Forum, 2011).
Japan	“Hometown dues” tax policy allows urban workers to pass some of their income tax back to underfunded rural areas. National-Regional-Local structured Environmentally Friendly Farming subsidy scheme, in which each tier has clear and complementary roles related to land use.
(Source: Baker (2018))	

“are a poor tool for income support and can introduce distortionary incentives that inhibit productivity” (Defra, 2018b: p 3).

In particular that

“Direct Payments can hinder productivity growth by undermining incentives to adopt best practice and by encouraging suboptimal investments that impact profitability” (Defra, 2018b: p 16)).

It is planned to roll-out ELMS in phases, eventually becoming available to all farms in England by 2025 (NAO, 2019). How well the proposed ELM systems dovetail into upland farming systems, and the proposed payment rates, will be critical to the economic survival of many upland farms. Currently agri-environment payment rates are limited by World Trade Organisation rules to “profit foregone”. With upland farming profitability low,

it is difficult to see how the loss of direct payment can be made-up through ELMS payments without a significant increase in the environmental outputs. This would impose additional environmental conditions on the farm, lowering production of traditional agricultural produce. However, it may increase productivity if input use is reduced by a higher proportion than output falls.

These policy changes will represent substantial challenges to all farm businesses, but especially to upland farms whose financial underpinning is so dependent on direct payments and agri-environment payments (Table 3). The survey suggests these changes will not be popular with upland farmers, with many respondents already unhappy with the extent and influence of environmental regulations. Only one respondent reflected on the possibility that they may have to cease producing traditional agricultural outputs (which on most upland farms is a loss making activity anyway (Table 3)) and focus on delivering environmental outputs as, in this case, a specialist conservation grazer.

5.3. Grants aided support for upland farming

The survey was conducted before the launch of the Countryside Productivity Scheme (CPS), a grant based scheme designed to improve farm productivity. CPS had two arms. Its Large Grant Scheme offered grants of up to 40% with a minimum grant of £35,000 but no maximum, for a range of projects selected for their potential to improve farm productivity. For example, capital grants could be used to purchase robotic equipment designed to aid crop and livestock production, to increase the use of renewable energy produced on the farm, to purchase LED wavelength controlled lighting to aid crop production, and to increase the efficient use of livestock slurries, manures and digestates. Clearly, many of these technologies would be of little use on upland farms. Moreover, the scheme requires applicants to co-fund to the value of at least £52,500, which is likely to be out of the reach for the majority of upland farmers.

The second arm of CPS was the Small Grants Scheme. This provided grants of up to 40% of eligible costs (increased to 50% for farmers in Cornwall or the Isles of Scilly) (Defra, 2018c). With a minimum award of £3,000 and a maximum of £12,000, applicants would need to find a more modest sum, of between £5,250 and £18,000, to apply. These grants can be used to purchase cattle handling systems, cattle crush and electronic weighing systems, and equipment designed to improve resource efficiency and nutrient management, items generally of more relevance to typical upland farmers.¹⁰ Provisional data shows that more than 3,500 such grants, worth a total of £23.5 million have been made (Defra, 2018c). There is currently no breakdown of awards by geographical region. Neither arm of the CPS supported the modernisation of or improvement to farm buildings.

5.4. Tenancy reform

Should the agricultural policy reforms be introduced, then more land is likely to come to market for purchase or to rent (Defra, 2018b). Given current trends, any new rental agreements would be FBT. So the concerns raised by respondents that the legal framework governing FBT was unbalanced in favour of the landowner are likely to become more important to the efficiency with which land is used. Some of these concerns have been raised by the Tenancy Reform Industry Group (TRIG) report in October 2017. However, the TRIG's concerns were not included in the Agriculture Bill. Defra (2019a) launched a consultation exercise to seek views on options for reform of agricultural tenancy law in England. A key aim of the consultation was to identify how reforms could remove barriers to help deliver productivity improvements, to facilitate structural change in the tenant farming sector, to support new entrants and the next generation of farms, to enable environmental improvements and to incentivise sustainable farming practices. However, most of the items under consultation refer to possible changes to Agriculture Holding Act tenancies rather than to FBT (Defra, 2019a).

¹⁰ Examples of items of livestock equipment eligible for funding include; handling systems, crushes, calving detectors, weighing equipment, calf feeders, EID devices, pasture plate meters and electric scraper systems. Examples of arable equipment eligible for funding include, precision-farming equipment, including GPS units, yield mapping devices, variable rate controllers and direct or strip till drills.

5.5. Examples of innovative policies

The policy suggestions given by respondents to help them remove their bottleneck included capital grant schemes (25), beneficial changes to and retention of the Basic Payment Scheme payments (10), the provision of training courses (7), adjusting the existing balance between food and environmental outputs towards food production (6), changes in taxation regulations (6), (and fewer than 5 responses for each of) reforms to tenancy law, provision of subsidised loans, and increasing output prices. They are, therefore, largely tried and tested approaches which could have been used under the European Union's Common Agricultural Policy.

In addition to withdrawing direct payments and making public money available for public goods, the Agriculture Bill includes measures to increase productivity,

“[The Agriculture Bill includes] provisions which allows the Secretary of State to give financial assistance for, or in connection with, the purpose of starting, or improving the productivity of an agricultural, horticultural or forestry activity” (Coe and Downing, 2018 p. 28).

How these measures are drafted to provide targeted benefits to upland farms will be critical to the rate at which upland farm businesses close. This is clearly shown by the Economic Resilience Scheme currently under consideration by The Welsh National Assembly (Welsh Government (2018)). As currently proposed, this economic resilience measure would provide “targeted, wide-ranging economic support” across the food chain to increase market potential, improve productivity, support farm enterprise diversification, assist with effective risk management, and to improve knowledge exchange, skills and stimulate innovation. However, any assistance will be “conditional on a credible business strategy, assessment of viability, and potential for a return on investment”, so that only farms “with the potential to be viable” (para 4.13) would be able to apply for support though this scheme. The Welsh Assembly accepts that not every farm will meet these criteria. A similar scheme may be of value to upland farmers in England, but the criteria used to assess the credibility of applicant's farm business strategy will clearly be important. For this reason The Welsh Assembly intends to create “a new and valuable income stream through the Public Goods scheme” (para 5.18) to support “the delivery of outcomes for which there is no functioning market” (para 6.4).

Therefore, the Economic Resilience Scheme may well be the mechanism that effectively differentiates those farms considered to have a future in food production from those whose future existence will depend on the delivery of public goods. Such a scheme may well increase agricultural productivity whilst reducing the production of traditional-farm outputs.

5.6. The Brexit “dividend”

The Agriculture Bill also includes measures that address other aspects of food production and the food chain. For example, it will facilitate the collection and sharing of data from those involved with/having an impact on matters linked to certain activities in the agri-food supply chain (excluding consumer-based information) to help

ensure “fairness” in the supply chain, to intervene in the market “in exceptional circumstances”, and to allow Producer Organisation to continue. These measures have found some support by respondents of this survey. However, Baker (2018) argues that the UK is at risk of missing the opportunities provided by Brexit to introduce innovative policies, such as those listed in Table 8. These include providing pensions for farmers to help succession related-issues, and governance systems that involve farmers in deciding the details of environmental schemes.

6. Conclusions

The economic performance of upland farm businesses in England is currently characterised by low profitability. Traditional agricultural activities are loss making, which means that direct payments and agri-environment payments underpin the financial viability and survival of many businesses. Under these circumstances it is perhaps not surprising the majority of respondents identified at least one resource constraint that created a bottleneck on their farming system which had adverse impacts on farm efficiency, productivity and profitability. However, the majority of respondents believed they were unable to remove their constraint, and so release the bottleneck, without external assistance. The policies respondents supported favoured increasing traditional farming outputs and the removal of environmentally-based restrictions on farming practices. This suggests the proposal to phase-out direct payments and introduce ELM systems would be unpopular with the majority of upland farmers. The overall impacts of these changes will depend on the detail of the schemes and programmes which are introduced.

The opportunity exists to influence future support in ways identified by the respondents such as the introduction of grants scheme targeted at the needs of upland farmers, for example to refurbish and expand agricultural buildings, to support training schemes, help provide affordable capital, and introduce tenant-favourable reforms to FBT. However, more far-reaching changes, along the line of an Economic Resilience Scheme and new environmental markets for which compensation payments are not tied to World Trade Organisation rules (such as carbon off-setting and flood management) may be needed to allow upland farms to continue in business.

Policy changes as fundamental as those proposed in the Agricultural Bill will create winners and losers. These will be determined by the new trade relationships and tariff levels for example, but as farmers cease trading more land will come to the market which will enable the surviving farms to expand. However, ELM is likely to be more demanding as it aims to enhance environmental performance, and therefore it is likely to become more restrictive of farming practices. Despite the economic realities, the majority of upland farmers still supported policies that prioritise food production at the expense of environmental outputs. If the planned policy changes do take place, then without targeted measures to support upland farms it is likely that a farmer’s willingness and ability to work their land for environmental rather than more traditional farming-related outputs will be the most significant determinants of which upland farms survive after the UK ceases to be a member of the European Union.

About the authors

Jeremy Franks is a Senior Lecturer in Farm Business Management in the School of Natural and Environmental Science at Newcastle University, and is Head of the third year Farm Management option. He has wide range of research interests, with over 100 publications. He is currently interested in the impact on farm businesses of the agricultural policies outlined in the Agriculture Bill.

Charles Scott is the Manager of the Farm Business Survey for the North and North East of England. He has worked with the FBS for many years, and has considerable experience surveying farmers, producing reports and disseminating information at local and national conferences.

Elliot Taylor is the Associate Farm Business Consultant at George F White. He has 20 years of experience in both the academic and commercial sectors. He currently leads a regional team of consultants providing professional advice to clients covering all areas of agricultural business management. His areas of expertise include farm management and strategic business planning, whole farm appraisals, budgeting and cash-flow management.

James Steele is a graduate of Newcastle University. He has worked for the Farm Business Survey for over 10 years, and during that time been involved in a number of bolt-on farm business surveys, helping to analyse and present research findings. He also helps manage his family’s 240 ha sheep and cattle hill farm.

Catherine Maughan is a Research Officer for the Farm Business Survey Unit within the School of Natural and Environmental Sciences at Newcastle University. She has over 10 years of experience in undertaking the Farm Business Survey and analysing and presenting the results to farmer co-operators. In addition, she has also collected data and contributed to varied areas of research on behalf of other stakeholders that have an interest in agriculture and the natural environment.

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REFERENCES

- AHDB (2018). *Driving productivity growth together*. https://projectblue.blob.core.windows.net/media/Default/Market%20Insight/Horizon_Driving%20Productivity_Jan2018.pdf [accessed August 2019].
- Baker, J. (2018). *UK FOOD, farm and land use policy needs to catch up with the rest of the world* ([13th August 2018]). Available at: <https://www.thersa.org/discover/publications-and-articles/rsa-blogs/2018/08/uk-food-farm-and-land-use-policy-needs-to-catch-up-with-the-rest-of-the-world>.
- Coe, S. and Downing, E. (2018). *The Agriculture Bill (2017-19)*. House of Commons Briefing Paper, No. CBP 8405, London, <https://researchbriefings.files.parliament.uk/documents/CBP-8405/CBP-8405.pdf> [accessed August 2019].

- DEFRA (2006). *Hill Farm Allowance: Explanatory Booklet 2007*. London: DEFRA.
- Defra (2008a). *Hill Farm Allowance Explanatory Booklet 2008*. London: Defra.
- DEFRA (2008b). *Specific funding for the Uplands*. Available at: <http://www.defra.gov.uk/rural/uplands/support.htm>.
- DEFRA (2008c). *Upland Land Classification*. Available at: www.defra.gov.uk/rural/uplands/land-classification.htm.
- Defra (2018a). *Defra Evidence and Analysis Paper No. 7. Agricultural Bill analysis and rationales for government intervention*. London, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/740670/agri-bill-evidence-paper.pdf [accessed August 2019].
- Defra (2018b). *Moving away from Direct Payment: Agriculture Bill: Analysis of the impacts of removing Direct Payments. Government Statistical Service*. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/740669/agri-bill-evidence-slide-pack-direct-payments.pdf [Accessed June 2019].
- Defra (2018c). *Rural Development Programme for England (RDPE) Countryside Productivity Scheme: Small Grant Handbook*. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/690772/Countryside_Productivity_Small_Grant_Scheme_Handbook_v1.0_online.pdf [accessed June 2019].
- Defra (2019a). *Agricultural tenancy consultation and call for evidence on mortgage restrictions and repossession protections for agricultural land in England. April 2019*. https://consult.defra.gov.uk/ahdb-sponsorship-and-agricultural-tenancies/agricultural-tenancy-consultation/supporting_documents/agriculturaltenancyconsultdoc.pdf [accessed June 2019].
- Defra (2019b). *Total Factor Productivity for England by Farm Type, based on the Farm Business Survey (Experimental Statistics)*. file:///E:/Work/Jeremy/Work%20related/main%20constraints/2019_TFP-by%20farm%20type-statsnotice-27jun19.pdf [accessed August 2019].
- Defra (2019c). *Total factor productivity of the UK agriculture industry. First estimate for 2018*. London, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/800783/agriproductivity_statsnotice_10may19.pdf [accessed August 2019].
- EFRA Committee (2011). *Written evidence submitted by Department for Environment, Food and Rural Affairs*. Environment, Food and Rural Affairs Committee, House of Commons. <https://publications.parliament.uk/pa/cm201011/cmselect/cmenvfru/556/556we08.htm> [accessed 2012]. [Online]. Available at: <https://publications.parliament.uk/pa/cm201011/cmselect/cmenvfru/556/556we08.htm> [accessed 2012].
- Forbord, M., Bjørkhaug, H. and Burton, R.J. (2014). 'Drivers of change in Norwegian agricultural land control and the emergence of rental farming'. *Journal of Rural Studies*, 33, pp. 9-19.
- Franks, J.R. (2006). 'Farm Futures: some Impacts of the Fischler Reforms on Livestock Farming in the North East of England'. *Journal of Farm Management*, 12(10), pp. 627-642.
- Harvey, D. and Scott, C. (various) *Farm Business Survey: Hill Farming in England*. Newcastle: Newcastle University.
- IEEP/LUC/GHK (2004). *An assessment of the impacts of hill farming in England on the economic, environmental and social sustainability of the uplands and more widely*. London: DEFRA. [Online]. Available at: <http://statistics.defra.gov.uk/esg/reports/hillfarming/volume1.pdf>.
- Land and Water Forum (2011). *A Common Direction for Water Management in New Zealand*. Available at: <http://www.landandwater.org.nz/> [accessed August 2018].
- Midmore, P. and Moore-Colyer, R. (2005). *Cherished Heartland. Future of the Uplands in Wales*. Cardiff: Institute of Welsh Affairs.
- NAO (2019). *Early review of the new farming programme*. National Audit Office, London, UK: HC 2221, SESSION 2017-2019, London, UK. <https://www.nao.org.uk/wp-content/uploads/2019/06/Early-review-of-the-new-farming-programme.pdf> [accessed June 2019].
- Wathern, P., Young, S.N., Brown, I.W. and Roberts, D.A. (1986). 'The EEC less favoured areas directive: Implementation and impact on upland land use in the UK.'. *Land Use Policy*, 3(3), pp. 205-212.
- Welsh Government (2018). *Brexit and our land: Securing the future of Welsh Farming*. https://gov.wales/sites/default/files/consultations/2018-07/brexit-and-our-land-consultation-document_0.pdf [accessed June 2019].