Factors affecting exit intentions in Norwegian sheep farms

Ola Flaten*

Norwegian Institute of Bioeconomy Research (NIBIO), Department of Business Economics and Management, P.O. Box 115, 1431 Ås, Norway

*Corresponding author: Tel.: +47 941 79 046. E-mail address: ola.flaten@nibio.no
Abstract

Western livestock sectors have shifted towards fewer, larger farms, causing concerns about the appearance of the countryside, ecosystem services, and rural depopulation. This study empirically estimates factors likely to affect exit intentions in sheep farms. Data were collected from specialised sheep farms included in the Norwegian Farm Business Survey. Of the 59 responses, 44 operators believed the farm would be producing sheep in 10 years. A logistic regression model was used to determine the most decisive variables associated with an exit intention, where the interdependence of factors affecting profitability and, subsequently, exit intention were taken into account. This study found that farmers reporting the most positive views of the local farming community were less likely to plan an exit. Exit intentions were not significantly influenced by farming goals, location, off-farm income, or profitability. The primacy of non-economic, community-based factors as an engine to sustain farms, suggests that more attention need to be paid to social processes and relations in local communities. Farmer groups and policy-makers should consider how to encourage supportive local communities when designing policies to retain sheep farms.

Keywords: Sheep farming; exit; local community; profitability; logit; Norway
1. Introduction

Over the last decades, Western livestock sectors have witnessed substantial shifts to fewer, bigger farms. The number of sheep farms in Norway has also declined, from 28,887 in 1989 to 14,391 in 2015 (Statistics Norway, 2016). The decline has been concentrated among smaller farms. For example, the number of farms with less than 100 winter-fed sheep decreased by 58% between 1989 and 2015, whereas the number of farms with more than 200 sheep increased from 84 to 527 in the same period. The number of breeding sheep (ewes and rams per July 31) has been quite constant with 0.89 million in 1989 and 0.91 in 2015, while the number of lambs increased from 1.28 million in 1989 to 1.46 million in 2015.

Farm structural changes have been a controversial policy matter in Western societies. Historically, farm exits – and entries – have played an important role in introducing technologies and productivity growth in the agricultural sector of many countries. The shift in production has led to declining farm numbers through farm exit and consolidation. These adjustments are difficult for farm families with implications for the economic and social viability of the local communities (Lobao and Stofferahn, 2008). Fewer sheep farms, and less grazing livestock in particular, will also have consequences for maintenance of rural landscapes, biodiversity and the protection of the environment. Where sheep grazing is removed, there can be shrub encroachment, which can lead to loss of elements of landscape and biodiversity (Dýrmundsson, 2006; El Aich and Waterhouse, 1999; Ross et al., 2016).

Despite the importance of sheep farming as regards provision of ecosystem services and vibrant farming communities, few if any studies have attempted to examine why some operations exit sheep farming whereas others continue. Research from farming in general or other farm enterprises has, however, been conducted to identify a large number of factors that influence exit rates. The majority of contributions show that larger farms (Breustedt and Glauben, 2007; Dong et al., 2016; Landi et al. 2016; Susanto et al., 2010), higher profitability
(Bragg and Dalton, 2004; Dong et al., 2016), and younger farmers (Bergfjord et al., 2011; Bragg and Dalton, 2004; Howley, 2015; Mishra et al., 2014) are associated with a lower likelihood of exit. Some studies have identified part-time farming as a means of stabilising a farm business (Breustedt and Glauben, 2007; Kimhi and Bollman, 1999), whereas others have reported that working off the farm increases the probability of exit (Bragg and Dalton, 2004; Goetz and Debertin, 2001; Weiss, 1997). The influence of location is also mixed. Goetz and Derbertin (2001) and Landi et al. (2016) report that a higher population density positively affects exit behaviour. In contrast, Glauben et al. (2006) argue that population density decreases exit rates.

Mental models are cognitive constructs that people use to interact with the world around them (Jones et al., 2014), and farmers’ mental models are influenced by values and knowledge and serve as a guide in learning and decision-making (Eckert and Bell, 2005). Bergfjord et al. (2011) and Howley (2015) have provided support that farmers with financial objectives are more likely to leave farming than those finding non-financial concerns such as environment, farming lifestyle, stewardship and farm labour related benefits more important.

Community-based social processes can also be engines of change. Lyson et al. (2000) found New York dairy farmers’ community engagement to be negatively associated with an exit intention. Gezelius (2014) have suggested that the economic viability of modern, capital-intensive farms increases when these farms are located in multi-farm communities characterised by lasting social networks. Further, Morgan-Davies et al. (2012) found interdependencies in Scottish hill farming areas in such a way that as neighbouring farms disappear, remaining farms become less tenable.

The objective of the current study is to identify key factors influencing exit intentions in Norwegian sheep farms. The study combines accountancy and survey data collected from specialised sheep farms.
2. Materials and methods

2.1. Sample and data collection

Data used in this study come from the Norwegian Farm Business Survey (FBS) conducted by the Norwegian Institute of Bioeconomy Research (NIBIO). The FBS contains extensive details about financial condition and farm production from a sample of Norwegian farm holdings. Farms above a minimum economic size (standard gross margin) of 8 ESU (European Size Units, 1 ESU = € 1200), are eligible to become a FBS farm. The annual sample covers about 900 farms, which are selected to represent 70% of the total farm population of about 42,000 farms in Norway, 92% of the total farmland and 96% of the total agricultural gross output. The farms included in the survey are randomly selected along three dimensions: economic size, region, and type of farming (NIBIO, 2016). Around 90% of the farms remain in the sample the following year.

To obtain attitudinal and behavioural data not covered in the FBS data, a questionnaire was sent per mail in mid-March 2009 to all FBS farmers at that time. The questionnaire achieved after two reminders a response rate of 60%.

In Norway, sheep farming are based on the extensive use of free-range forest and mountain pastures in summer. Housing and feeding are required throughout the winter due to snow and frost, often for more than half of the year. Many sheep farms are located either close to mountain areas and other sparsely populated areas or along the coast, but some farms are also more centrally located.

The annual FBS data sets include around 200 farms with sheep. For the purpose of this study, farms with sheep kept in mixed farming systems of various types, for example, mixed dairy and sheep farms, were not included, making it possible to examine the effects of profitability in sheep farming on exit tendencies. This study was therefore restricted to the
annually around 100 specialised sheep farms, where the majority of farm gross output came from sheep. The FBS sample of specialised sheep farms represents 46% of the total sheep population and 33% of the sheep farms in Norway (own calculation). Due to the size requirement of at least 8 ESU, specialised sheep farms with less than 40–50 breeding ewes are not included in the FBS sample. These smaller holdings account for 8% of the sheep and 18% of the sheep farms.

In this paper, data only on sheep farms participating in the FBS in both 2007 and 2008 were used. Average figures of the 2 years were used to better characterise farm differences in physical and financial performance arising from managerial abilities rather than returns from a single year, which are more random because of uncontrollable events (such as the weather).

After deleting specialised sheep farms that did not respond to the questionnaire or with missing values on important variables to be used in the analysis, 59 usable observations remained.

2.2. Measures

Variables used in the analysis are presented in Table 1.

[Table 1]

2.2.1. Exit intentions

Exit intentions were measured by a self-reported response to whether the operator believed the farm would be producing sheep in 10 years. The indicator =1 was applied if the farm intended to exit sheep farming, and zero otherwise. Therefore, exit in this article means switching out of sheep production, irrespective of whether the farm exits the farming industry or takes up production of an alternative enterprise.
2.2.2. Profitability

The study focus on profitability based on both short-run and long-run rules. The exit or shut-down decision rule is based on the comparison of revenues relative to operating costs. Long-run profitability does also include returns on capital invested in the farm business and the opportunity cost of unpaid labour input, providing an indicator of whether the farm can replace capital assets and stay in business over time.

Long-run profitability was measured as the profitability coefficient (PC), defined as (Flaten et al., 2011):

$$PC = \frac{\text{Net farm income}}{\text{Interest claims on total value of farm assets} + \text{opportunity cost of unpaid labour}} \times 100.$$  

Here net farm income represents the return to all unpaid labour and management and to all the capital invested in the farm business. The farm asset value for the year is found by averaging the beginning and ending total asset values from the farm balance sheets. Following the procedures of the FBS, a flat labour charge per worked family hour equal to the wage rate for a skilled farm worker was used to compute costs of unpaid labour. The interest claims for farm asset values were set equal to the interest rate used in the FBS (5.5 per cent per annum).

If PC equals 100 (or higher), net farm income is sufficient to provide a return to capital and unpaid labour equal to (or higher than) their opportunity costs.

The short-run measure, return over operating costs (ROOC), was defined as gross farm sales (government payments included) net of operating costs, measured per breeding sheep. Operating costs included costs for feed; veterinary and medical services; bedding and litter; marketing; custom services; fuel, lubrication, and electricity; repairs; other costs; and operating interest. Annualised cost of maintaining the capital investment in the farming operation, costs for insurance, and costs of all labour were not included.
2.2.3. Off-farm income

The off-farm income variable measures the importance of off-farm income relative to other income sources. Total farm household income is defined as the sum of net income from all farming activities (agriculture, forestry, and on-farm diversification), non-farm business income, wages and salaries, pensions and sick pay, dividends, and interest earnings minus interest payments (NIBIO, 2016:137). The share of work-related off-farm activities (non-farm business income, wages, and salaries) in total farm household income was used as a proxy for the off-farm income variable.

2.2.4. Farming goals

The questionnaire included 20 statements on goals in farming, ranging over a wide variety of issues. The items were based on previous studies (Lien et al., 2006; Maybery et al., 2005) and were measured on a 7-point rating scale ranging from “not at all important” to “most important”.

Principal component analysis (PCA) with varimax rotation was applied to transform the 20 items to a smaller number of components. The value of the Kaiser-Meyer-Olkin overall measure of sampling adequacy (MSA) was 0.81 for the final solution, which included 11 items. A two-component solution was preferred. These components accounted for 64% of the total variance. Each item had a component loading of 0.74 or higher on only one component. All final communality estimates were above 0.55.

The first component, labelled “non-financial”, had high loadings on the following seven components: “ensure the best possible animal welfare standard”, “contribute to domestic food production”, “contribute to rural viability”, “maintain the cultural landscape”, “use pesticides and fertilisers sparingly”, “restrict the loss of nutrients”, and “maintain biodiversity” (Cronbach α = 0.89). The second component, labelled “financial”, included four components:
“high return on investments”, “maximise income”, “increase net worth”, and “reliable and stable income” (Cronbach α = 0.82). The Cronbach α values were above a generally agreed lower limit of 0.70 (Hair et al., 2006).

Summated scales were formed by combining all of the items loading highly on a component into a single composite measure where individual items were averaged. The components, represented by the composite measures, highlighted contrasting farming goals. Finally, the difference between the two summated scales was estimated, to be used in subsequent analysis as a measure of non-financial relative to financial goals.

2.2.5. Local farming community

Self-reported measures of farmers’ views on their local farming community were used. These measures are original and were measured on a 7-point rating scale ranging from “totally disagree” to “totally agree”. The statements were as follows: “In my local community there is a good farming environment”, “meeting other farmers is for me an important source of well-being”, and “people in my local community recognise ingenuity and innovation”.

A PCA was performed on the three statements. The model achieved an overall MSA of 0.73. One predominant component explained 78.5% of the variance. All component loadings were close to 0.90. The final communality estimates were all above 0.75. Cronbach’s α for the three items was 0.86, suggesting that it was appropriate to combine them into a single measure of what was labelled “local farming community”. A high score indicates a supportive local farming environment.

2.2.6. Location

Statistics Norway (2008) has constructed an indicator of centrality, placing each Norwegian municipality in one of four centrality categories. The variable measures the municipality’s
geographical location relative to a centre with higher order functions such as banks or post offices, as well as related to population size. Statistics Norway refers to these categories with values from zero to three, in order of increasing centrality: least central, less central, quite central, and central. To account for possible exit heterogeneity among farms of different centrality, the centrality categories were dichotomised into remote (value 0–1) and central (value 2–3) locations.

2.2.7. Other variables

*Flock size* was measured in number of breeding sheep (ewe lambs for breeding included) as of March 1. Flock size was adjusted for other ruminants present based on forage requirements (multiplication factors in parentheses): suckler cows (8), beef bulls (4), and goats (1).

*Meat output* per breeding sheep was used as a measure of sheep productivity. In addition to sales of lamb and mutton, inventory changes in sheep stocks and sales and purchases of live sheep were taken into account when calculating production of meat per breeding sheep. Meat output was described on a per kilogram carcass weight basis.

*Solvency* refers to a farm household’s total capital structure and its ability to meet its liabilities. The equity/asset ratio was used to evaluate solvency. *Agricultural education* indicates if the operator or the spouse has one or more years of agricultural education.

*Ownership* denotes the farm operators’ years of farm ownership.

2.3. Statistical analysis

First, farms that stated an intention to exit and those that did not were compared based on all variables presented in the study. A *t-test* for metric variables and a chi-square or Fisher’s exact test for discrete variables was used to assess the significance of differences between the groups.
Next, the most decisive variables associated with an exit intention were determined. There is an interdependence of factors affecting profitability and, subsequently, the exit intention. A two-stage approach was used to control for endogeneity in the exit decision model (Bragg and Dalton, 2004). In the first stage, factors affecting farm profitability measures were estimated. In the second stage, a binary logistic regression model was used to determine how the explanatory variables, including predicted profitability, influence the two options: exit or continue in sheep farming.

In stage 1, ordinary least squares (OLS) regressions were used to calculate the estimated profitability measures as a function of operator and farm characteristics such as ownership, agricultural education, solvency, flock size, and meat output (ownership was chosen instead of the correlated variable operator age).

In stage 2, under a logit specification, the predicted probability of exit for farm $i$ ($P_i$) (Greene, 2012) is identified as:

$$P_i = \frac{e^{\beta X_i}}{1 + e^{\beta X_i}}$$

Here $X_i$ contains the values of the explanatory variables of the model (location, off-farm income, predicted profitability, farming goal, and local farming community), including a constant, and $\beta$ represents the model coefficients to be estimated. The small sample size restricted the number of explanatory variables to be included in the logit models. The penalised likelihood approach proposed by Firth (1993) was used to reduce small-sample bias in maximum likelihood estimation of the logit models.

The results are reported as odds ratios and marginal effects. The marginal effects were computed at every observation in the sample and then averaged across all observations, which produces the average partial effects that are preferred in small samples (Greene, 2012).

No collinearity problems were encountered among the explanatory variables using variance inflation factors (all $<1.32$ in OLS, all $<1.30$ in logit) and condition indices ($<1.89$)
in OLS, <1.74 in logit). Statistical analyses were carried out with SAS 9.3 (SAS Institute, Cary, NC, USA), except for the use of STATA 12.1 (StataCorp, College Station, TX, USA) to estimate marginal effects.

3. Results and discussion

3.1. Descriptives

Twenty-five percent of the sample farms reported that they intended to exit sheep farming within a time horizon of 10 years. The intended annual exit rate is close to the actual exit rate in Norwegian sheep farming in the last decades.

Table 2 presents a summary of the characteristics of the exiting and remaining farms as well as the whole sample of sheep farms. Average performance indicates that flock size across the full sample was 138 breeding sheep, producing 28.2 kg meat per sheep per year with a ROOC per sheep of NOK 1969 and a PC in farming of 43. The low PC implies a return to capital and unpaid labour well below their opportunity costs. Average years of farm ownership was 17.8 years, with 63% holding an agricultural education, 29% with a central location, an average share of off-farm income of total household income of 62%, and an equity/asset ratio of 68%.

Table 2 also present results of a bivariate analysis conducted to test if the distributions of the characteristics between the two groups – exiting and continuing – were statistically significant. The results indicate that the intention to exit sheep farming was significantly associated with only two of the variables: local farming community and farming goals.
Perceptions of the local farming community were in general positive, but exiting farmers scored 1.37 points lower than the continuing farmers ($P = 0.01$). Non-financial farming goals scored on average higher than the business-related goals, supporting the rich literature on the importance of non-monetary benefits from farming (Garforth and Rehman, 2005). Exiting farms did, however, find financial goals relatively more important than the continuing farms ($P = 0.02$), as also reported by Howley (2015).

### 3.2. Profitability

The first-stage regressions showed as expected that larger flocks, on average, generated a higher PC than smaller flocks ($P < 0.05$; Table 3). On average, more experienced farmers did also perform better, measured as PC ($P < 0.05$). Higher yielding flocks did not achieve higher PC than those with lower meat output per breeding sheep. This result is in contrast with studies of other livestock farming systems, which often find yield differentials to be a key performance driver in farm profitability (Wilson, 2011). A plausible explanation is the use of livestock and area payments rather than higher output prices that moderates the economic importance of high yield per head (Flaten and Rønning, 2011). Agricultural education and solvency also had no significant associations with PC.

[Table 3]

ROOC was positively related to a higher equity/asset ratio ($P < 0.05$; Table 3). The other explanatory variables showed no significant effects on ROOC. The predicted PC and ROOC values from the OLS regressions were integrated into the second-stage logit regression models.
3.3. Model results

Results from the logit model estimates of farmers’ intentions to exit sheep farming are presented in Table 4. Specification 1 reports the model that included predicted PC as an explanatory variable, and specification 2 included predicted ROOC. Marginal effects are reported in Table 5.

(Table 4 and Table 5)

The overall models were significant \((P < 0.01)\) according to the likelihood ratio test (Table 4). To measure predictive power or how well the response variable is predicted based on the explanatory variables of the models, two \(R^2\) measures were calculated: McFadden and Tjur (Allison, 2014). The estimated models showed \(R^2\) measures of 0.26–0.29. Goodness-of-fit (GOF) tests help to decide whether the model is correctly specified. The models were checked for fit using four GOF tests, as recommended by Allison (2014). The low values in all GOF tests, yielding high \(P\)-values, suggest that both models fit the data well.

The estimated models yielded statistically significant parameters for the local farming community variable (Table 4). The other explanatory variables (location, off-farm income, predicted profitability, and farming goal) lacked statistical significance. The two model specifications generally yielded similar estimates in parameters, suggesting that specifying profitability in terms of PC and ROOC provided consistent results. For practical discussion, results given in specification 1 (PC) are emphasised, unless otherwise stated.

The higher a farmer’s perception was of the local farming community, the lower the probability of an exit intention \((P < 0.01;\) Table 4). The odds ratio was close to 0.50; that is, holding all other variables constant, for each one-unit increase in the score on the local farming community variable, the odds of exiting were halved. The estimated marginal effect
was -0.105 ($P < 0.01$; Table 5). This finding means that with a one-unit increase in the score, the probability of exiting decreased by 10.5%. A plausible explanation is that most economic behaviours are embedded in social networks (Granovetter, 1985), and areas where farming and rurality figure prominently are often found to have high levels of civic engagement (Gómez-Limón et al., 2014). Many studies have described how individuals and local communities that are rich in community participation and the social cohesion that it generates are advantaged across economic, social, and health domains (Coleman, 1990; Hogan et al., 2011; Putnam, 1995); it is positive for farmers’ well-being to be part of multi-farm communities with lasting social networks (Gezelius, 2014), and these dimensions are consequently important to exit intentions. The findings in this study support the results given by Lyson et al. (2000), where farmers’ community engagement decreased exit intentions. Since the local farming community variable was the only statistically significant variable, this factor seems to be of particular importance for the intent to continue with sheep farming. However, a conclusive relationship between the local farming community variable and farm exit rates solely on the basis of findings in this single study cannot be claimed.

The only additional marginal effect that tended to be significant was off-farm income in model 2 (ROOC, $P < 0.10$), suggesting that a 1% increase in total household income from off-farm work increased the probability of exit intentions by 0.36% (Table 5). Many sheep farms are part-time operations that are integrated with off-farm work. High off-farm income nevertheless tended to provide a pulling force on the exit intention, consistent with findings in Bragg and Dalton (2004), Mishra et al. (2014), and Weiss (1997).

The lack of statistical significance of many results should be assessed in light of the small sample used in the analysis. Logit-type models remain relatively robust for Type I errors and marginal effects estimates with small samples; however, caution is necessary in forming conclusions based on non-findings, that is, Type II errors (Bergtold et al., 2011; Hart...
and Clark, 1999). The risk of making Type II errors (false-negative findings) increases, and several true relationships may not be discovered. For example: a central location of a farm more than doubled the odds of reporting exiting compared to remote farms, and for each one-unit increase in the score on the composite variable for farming goals, the odds of reporting exiting decreased by a factor of 0.74 (Table 4). The magnitudes of these effects are large enough for their explanatory variables to have meaningful (although not statistically significant) influences on the exit rate.

Predicted farm profitability had a low impact on the exit intention. The non-significant coefficients suggested that more profitable farms, as measured by PC and ROOC, were more likely to exit. In contrast, studies of dairy farms have found higher profitability to lower the exit rate (Bragg and Dalton, 2004; Dong et al., 2016). At first glance, the finding here is surprising. It is, however, widely reported that farmers farm for reasons other than maximising profit (Garforth and Rehman, 2005; Howley, 2015). Furthermore, studies have found sheep farmers (in Norway) to be more satisfied with their farm work and lifestyle (despite the lower profitability) than farmers in general (Flaten and Rønning, 2011). The high satisfaction with the varied lifestyle and non-financial benefits in sheep farming may explain the low relevance of profitability to the exit decision.

3.4. Policy implications

Fewer sheep and sheep farms can have severe effects on the well-being of rural communities, the appearance of the countryside, biodiversity, and heritage values. The question arises of what policies best accomplish keeping sheep farmers in agriculture.

A number of government policies can influence farm structure. Some studies have found farm-support programmes to decrease exit rates (Breustedt and Glauben, 2007; Mishra et al., 2014; Raggi et al., 2013), whereas a study by D’Antoni et al. (2012) concluded that
government payments are a factor in pushing labour off the farm. One the one hand, government payments may help marginal farms to remain in business. On the other hand, payments can encourage farmers to expand. As a result, the structural impact of government programmes may be somewhat ambiguous and dependent on their design. This research identified additional factors that influence exit decisions and the need to go beyond the scope of price support and government payments to reduce farm exits.

Findings from this study point to the important effects of farmers’ perceptions of their local farming community and social processes on exit intentions. In many societies, (local) farmer collaboration has long been institutionalised in many forms of, for example through, local farmer organisations and associations, meetings and field days, informal farmer networks and groups for co-learning and exchange of ideas. Various collaboration initiatives can be important for farmers’ social relations. Further farmer and farmer group engagement and entrepreneurialism in the local community may be required to create new forms of social collaborations, both within and outside the local community, including the use of Internet and social media.

The issue of local social relations and innovations is not only a task for individuals in farming communities; public policy is also important (Bock, 2016). Public financial contributions can help to reduce exit rates if facilitating, for example, social networking and collective learning. Withdrawal of support for collaboration efforts can contribute to farm exits. This study suggests that a somewhat larger proportion of public agricultural funds to initiatives that encourage formation of social relations for farmers could have significant implications for keeping farms in the business.

3.5. Limitations and future research
This study has some limitations. One important point to note is that the reported relationships are associative rather than causal. To control for endogeneity, predicted values of the profitability measures were used. Endogeneity bias could still be affecting the estimates because the presence of other confounding factors cannot be ruled out. Outcomes can also be influenced by factors not specified in the model.

The empirical evidence of determinants of exit intentions is local, derived from a particular time, place, farming enterprise, and research design. There may be a question as to whether the findings are specific to the Norwegian sheep farming context examined at that particular time or whether they are generalisable to other farming environments. To further explore the link between social factors, in particular, and exit rates, additional studies within different kinds of farming environments across time and space should be undertaken so that a more general picture begins to emerge. This study supports the proposal of Gezelius (2014) that more research is needed to address a farm’s dependence on the broader community of neighbours, friends, and long-term colleagues.

The omission in the FBS of the smallest sheep farms, operations that may exist independently of the farm economy, precluded an analysis of their exit behaviour and implications for farm structures and land uses. The sample was necessarily small because of the reliance on archival financial performance measures from specialised sheep farms in the Norwegian FBS. The small sample size restricted analytical options and model specificity. Future research should include more explanatory variables to further examine the extent and limits of local farming community variables on exit behaviour. There is also a need for qualitative approaches such as in-depth interviews with farmers to gain a sharpened understanding of their reflections on exit decisions, and to better understand the deeper reasons and processes behind a decision to leave farming.
This study was based on stated intentions. Stated intentions are valuable information, also serving to examine policy effects. Intentions that are correctly expressed cannot, however, be assumed to be translated automatically into actual exit behaviour. Nor is a retrospective assessment necessarily a good measure of the actual choice because people may state beliefs to justify their choices; that is, the decision affects the beliefs instead of beliefs affecting the decision. Predictive power across a variety of both reported past behaviours as well as future planned behaviour would increase the validity of a hypothesis or theory.

Exit intentions connected to policy changes were not analysed. One needs to be aware that the conclusions derived from this study may not apply if major policy changes are introduced.

4. Conclusions

The results of this study provide evidence of the impact of farmers’ perceptions of the local farming community on the probability of exit intentions, where a lower perception increases the probability of exit intentions from sheep farming. The estimated marginal effect suggests that a one-unit increase in the score (on a scale from 1 to 7) on the local farming community variable decreases the probability of exit intentions by 10.5%. Farming goals, location, off-farm income, and profitability did not play a statistically significant role in the current sample.

The study suggests that farms and farmers being part of and embedded in community social structures is a key element to enhance the viability of farms. Farm policy may be more cost-effective in retaining sheep farms if the local community factor is considered in its design.

Acknowledgements

Funding for this work was provided by the Research Council of Norway [grant number NFR 208036] and Småfeprogrammet for fjellregionen (County Governor of Hedmark) through the
The author is grateful to Stig S. Gezelius, Torbjørn Haukås, Valborg Kvakkestad, Gudbrand Lien, Sjur Spildo Prestegard, two anonymous reviewers, and one of the Editors for helpful comments and suggestions.

References


Garforth, C., Rehman, T., 2005. Review of literature on measuring farmers’ values, goals and objectives. Project report no. 2 in the ‘Research to understand and model the behaviour and motivations of farmers responding to policy changes (England)’. School of Agriculture, Policy and Development, The University of Reading, Reading.


http://stabas.ssb.no/ClassificationFrames.asp?ID=919597&Language=en (accessed 25.03.15)


https://www.ssb.no/en/jord-skog-jakt-og-fiskeri/ (accessed 01.10.16)
