Early Exit from Business, Performance and Neighbors' Influence: A Study of Farmers in France*

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Abstract

This article examines the influences of economic performance and neighbors' characteristics on farmers' early exit decisions. Using a unique set of social security data describing all French farmers over the years 2004-2017, we investigate how these influences depend on farmers' characteristics and their position relative to their neighbors Probit estimations show that younger farmers and farmers operating smaller farms are more sensitive to their own and neighbors' performance. Allowing for an asymmetric comparison effect between farmers and their neighbors, we uncover a nonlinearity in the influence of own and neighbors' profit and size. Consistent with prospect theory and the empirical literature on relative income, farmers below their neighbors' average are found to be more influenced by relative profit and size.

Keywords: Exit; Farms; Performance; Profit; Neighbors; France.

JEL classification: D22; Q12; R32.

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The sustained downward trend in the number of farmers in industrial countries raises concerns about the future of farming in these countries, and the reason why farmers quit. Classically, farmers' economic performance and the level of local competition, notably for land, are expected to play a key role in this decision. However, empirical evidence of these effects remains scarce. In this article, we examine the influences of farmers' economic performance and neighbors' characteristics on exits, and how these influences depend on farmers' characteristics and their position relative to their neighbors.

To do so, we employ a unique data set at the farmer-level produced by the French authority for farmer health care and social security ("Mutalité Sociale Agricole" or MSA). Contrary to most past studies resorting to farm-level census data available only for certain years (Weiss 1999; Kimhi 2000; Goetz and Debertin 2001; Foltz 2004; Key and Roberts 2006; Storm et al. 2015) or survey data on a sample of farmers (Dong et al. 2010; Dong et al. 2016), our data set is both exhaustive and annual, in the sense that it contains the yearly records of all French self-employed farmers who contribute to the health care and social security system between 2004 and 2017. One strength of this panel data set is thus that it permits the identification of all exits from the farming sector, the year in which they occur, and the characteristics of the farm and farmer prior to exit. Since we are primarily interested in exits motivated by economic reasons, we focus on early exits from business and hence remove farmers of retirement age from the data.[1] The richness of the data allows us to investigate various kinds of heterogeneity in the effects of the characteristics of farmers and their neighbors on the expected utility of exit. Our estimations uncover a nonlinear effect of relative profit and size between farmers and their neighbors, with stronger marginal effects for farmers below the average of their neighbors.

We first estimate the influence of agricultural profits on the probability of exit using a probit model and study how this influence varies across farmers depending on their age, the size of their farms, and their number of associates. Our estimations reveal significant heterogeneity in the effect, which is more negative for younger farmers with smaller farms. This result contributes to fill the gap in the literature on the influence of economic performance on farm exits.[2] To the best of our knowledge, only a few case studies provide empirical evidence of the expected negative link between firm performance and firm exit (Dimara et al. 2008; Dong et al. 2016; Peel et al. 2016). Using a subset of the data we use, Saint-Cyr et al. (2019) also estimate heterogeneous effects of agricultural profit on exit, but consider this heterogeneity as unobserved.

Second, we estimate the influence of the density of farmers in the neighborhood and of the neighbors' characteristics, including their average profit and size, on a farmer's exit decision. We check the consistency of our estimates

[1] Pietola et al. (2003) also resort to social security data in Finland, but they include only elder farmers (between 55 and 64 years old), that is, those close to retirement, while we consider only those who are not of retirement age.

[2] The literature is however dense on other factors driving structural change in the farming sector, such as farm size (Weiss 1999; Sumner 2014), public policies (Foltz 2004; Ahearn et al. 2005; Key and Roberts 2006) or cohort effects (Katchova and Ahearn 2017). Quite surprisingly, the influence of economic performance has received less attention.

to two different definitions of neighborhood, either a given municipality only or both the given and adjacent municipalities, and two types of neighbors, either all farmers or only farmers engaged in the same type of farming. Interacting the neighbors' average profits with farmers' characteristics, we find that neighbors' profits may generate positive or negative spillovers depending on farmers' characteristics. This qualifies the recent contributions of Storm et al. (2015) and of Saint-Cyr et al. (2019) who consider a constant effect of neighbors' profits, and obtain opposite signs. Our estimates consistently show that neighbors' average profits have a stronger influence on the exit decision of younger farmers. We also find evidence that smaller farmers are significantly more sensitive to neighbors' average profits when deciding whether to remain in or exit early from the business. These results are in line with several articles showing that neighbors' have a greater influence on "vulnerable" populations in various fields of economics, including labor (Weinberg et al. 2004; Falk and Ichino 2006), psychology (Santiago et al. 2011) and industrial organization (Neffke et al. 2012; De Vaan et al. 2013). The nonlinear neighborhood effect we obtain also relates to the nonlinear peer effects exhibited in the education economics literature (Sacerdote 2001; Carrell et al. 2013); see Sacerdote (2011) for a review.

Lastly, we uncover a nonlinearity in the effect of neighbors' profits and size, depending on whether the farmer is below or above the neighbors' average. To do so, we consider an asymmetric influence of the respective differences between own and neighbors' profit and size, which we hereafter refer to as the relative profit and size. We find that farmers below the neighborhood average are more sensitive to relative profit and size. This nonlinearity explains most of the heterogeneity in the effects of own and neighbors' profit on exit. Farmers below the average suffer more severe adverse competition effects from their neighbors, while farmers above the average tend to benefit from having more competitive neighbors. These last findings relate to the literature on the effect of relative income on subjective well-being; see, for instance, Luttmer (2005) and Clark et al. (2008) for a review. In our framework, the effects of relative profit and size on the expected utility of exit are nonlinear and larger among farmers who are below the average of their neighbors. This resonates with a repeatedly established result in the life satisfaction literature. Among other papers, Ferrer-i Carbonell (2005), Vendrik and Woltjer (2007) and Senik (2009) provide strong evidence that the marginal effect of relative income on life satisfaction is larger for negative values of the former, a phenomenon consistent with the nonlinear value function in prospect theory (Kahneman and Tversky 1979; Tversky and Kahneman 1991) and which corroborates our finding.

The remainder of the article is structured as follows. Section 1 presents the data set and how we construct the variables controlling for neighbors' characteristics. Section 2 explains our empirical strategy and how we progressively introduce more heterogeneity in the estimated effects. Section 3 presents the results of our estimations. We first comment on the heterogeneity in the effect of own performance and that in neighbors' influence, then we describe the nonlinear effect for neighbors below and above the average of the neighborhood, and finally, we show the distribution of the total effect of a shock on all profits. Section 4 concludes the article.

1 Data

1.1 Description of the data set

The French authority for farmer health care and social security (MSA) provided access to its database that includes all individuals registered as self-employed farmers in France on January 1 of each year over the period 2004-2017. For each farmer registered in the database, the available data consist of various characteristics of him/herself and of the farm that he/she operates.

To exclude from the data exits due to legal retirement and to focus on farmers exiting for other reasons, we only work on the sub-sample of farmers under 50. Furthermore, we exclude farmers paying a flat-rate social security tax (27.6% of farmers in the full database), as this implies that their agricultural profit, which we use as the indicator of economic performance, is not reported in the database.[3] This leaves us with a large sample of 2,272,158 observations over 14 years, related to 308,854 farmers and 261,587 farms. We define exit in year $t+1$ when both the farmer and the farm that he/she operates are not present in the database in $t+1$ and subsequent years, meaning that the farmer is no longer a self-employed farmer and that his/her farm stops being operated as such. The farm may, however, be dismantled and integrated in pieces into other farms or taken over by another farmer with a new record number. These cases are, however, not investigated here because we focus on farmers' exits and not on farm exits per se.

The agricultural profit is defined as the difference between the total output and the total input generated by the farm during the tax year. The total output consists of agricultural market sales and public support, stock variations and gains or losses derived from asset sales. Total input consists of variable costs (including paid salaries and the corresponding social contributions), overhead, taxes and depreciation costs. In the MSA database, each farmer is attributed an agricultural profit: if the farmer operates a farm with associates, his/her agricultural profit is adjusted by his/her capital shares in the farm. For each year t and each farmer i, we observe the agricultural profit of each of the five years t to $t-4$. We define $\overline{PROFIT}_{i,t}$ as the average of the agricultural profit over these five years, which is our main variable of interest in this article.

Based on the existing literature on farm exit and on data availability in the MSA database, the explanatory variables for the probability of exit include the farmer's age (AGE), the operated area ($SIZE$), the agricultural profits

[3] For the farmers that we retain in the database, the social security tax amount is based on the annual profit and is thus reported in the data.

($\overline{PROFIT}$), the production specialization of the farmer (SPE), the farmer's marital status ($MARITAL$), the importance of farming relative to off-farm work ($IMPFARMING$) and the number of self-employed associates operating on the farm ($ASSOCIATES$). Regarding profit, if the farmer has associates, the operated area recorded in the data is the fraction of the total farm area corresponding to the farmer's capital shares. We also consider categorical variables for age ($AGECAT$) and the number of associates ($ASSOCIATESCAT$) to allow for a nonlinear effect of those variables on the probability of exit. Table 1 provides the summary statistics of these variables.

Table 1: Summary statistics

Quantitative variables (for each farmer)					
Variable (unit)	Mean	Median	Min.	Max.	S.d.
$\overline{PROFIT}$ (k€)	14.5	11.1	-433.8	1,123.0	18.6
$SIZE$ (ha)	65.2	54.4	0.0	1,549.4	52.0
AGE (years)	40.4	42.0	18.0	49.0	6.4
$ASSOCIATES$	0.7	0.0	0.0	48.0	0.9

Categorical variables (share of farmers)			
Farmer's exit		Farmer's age	
$EXIT$		$AGECAT$	
Yes	0.9 %	18-24	1.0 %
No	99.1 %	25-29	6.2 %
Number of associates		30-34	12.5 %
$NASSCAT$		35-39	19.6 %
0	50.3 %	40-44	27.8 %
1	35.2 %	45-49	32.8 %
2+	14.5 %	Farmer's specialization	
Marital status		SPE	
$MARITAL$		Beef cattle	15.6 %
Single	41.7 %	Dairy cattle	25.5 %
Married	54.7 %	Field crops	19.2 %
Separated	3.1 %	Fruits and vegetables	3.1 %
Widowed	0.4 %	Mixed crops and mixed livestocks	15.2 %
Importance of farming		Other livestocks	1.0 %
$IMPFARMING$		Other permanent crops	2.1 %
Exclusive activity	89.1 %	Pigs and poultry	5.6 %
Main activity	6.3 %	Sheeps and goats	3.0 %
Secondary activity	4.6 %	Vineyards	9.6 %

Between 2004 and 2017, 0.9% of the sample farmers exit early, that is, before retirement age. Given our large sample size, we observe 20,381 early exits in the data, a number large enough to safely neglect the small sample bias in discrete choice models applied to rare events[4]. The annual agricultural profit for each farmer is 14.5 k€ on average, but note that average profits are negative for 8.9% of the observations. The farmers in our sample operate 65.2 ha on average, which is slightly more than the 2010 Agricultural Census average of 55 ha (Agreste 2011).[5] Almost one-third of the farmers are aged 45-49, and 7.2% are under 30. Farming is the exclusive activity

[4] See King and Zeng (2001) for an analysis of this bias in the case of the logit model.

[5] This is because farmers paying a flat-rate social security tax, who are excluded from our sample, generally operate smaller farms. Note, however, that our data do include small farms, as 213,609 observations have areas under 10 ha.

for a large majority (89.1%) of the sample farmers. Approximately half of the farmers (50.3%) work with no associate.

1.2 Definitions of the neighborhood

The municipality where the farmer's farm is located enables the identification of the farmers' neighbors. For each farmer, we compute several neighbor variables, namely, the average agricultural profit of the farmer's neighbors over the past five years ($N\overline{PROFIT}$), the average annual operated area ($NSIZE$) of the farmer's neighbors, and the annual density of the farmer's neighbors ($NDENSITY$). The latter is defined as the ratio of the number of neighbors ($NNUMBER$) to their aggregate operated area ($NAREA$).

We use two definitions of neighborhood. In the first definition, we restrict the definition of neighbors to those whose farm is located in the same municipality as the farmer under consideration. In the second definition, following Latruffe and Piet (2014), we also consider farmers located in municipalities adjacent to the farmer's municipality. In both definitions, we exclude the farmer and his/her associates from the set of neighbors, and all neighbors are assigned an equal weight. For each specification presented in section 3, we test whether our estimates are robust to the use of either of these two definitions of neighbors.

Table 2 displays descriptive statistics on the neighbors. The means and medians are similar when considering only neighbors in farmers' own municipalities and when including adjacent municipalities. For further robustness checks, we also consider a stricter definition of neighbors whereby only farmers with the same specialization are included in the neighborhood. The corresponding summary statistics are provided in Table 6 in the Appendix.

2 Empirical strategy

In each period, farmers face two alternatives for the next period, remain in business (i.e., survival) or close the business (i.e., exit). The binary decision depends on the difference in expected utility between the two alternatives, but we only observe the farmers' resulting decision, while the difference in utilities is a latent variable that is not observed. We consider the following general Probit model for the probability of exit:

$$\text{Prob}(EXIT_{i,t+1}) = \Phi(\beta_0 + \beta_1 X_{i,t} + \beta_2 NZ_{i,t} + \alpha_t + \alpha_{d_i}) \tag{1}$$

where i denotes farmers; t denotes time periods; $EXIT_{i,t+1}$ is a binary variable indicating that the farmer exits the sector in period $t+1$ when the variable is equal to 1 and remains in the sector when the variable is equal to

Table 2: Summary statistics: Variables relative to neighbors

Variable (unit)	Mean	Median	Min.	Max.	S.d.
Neighbors in farmers' own municipality					
$N\overline{PROFIT}$ (k€)	14.4	12.1	-8,022.4	606.8	13.2
$NSIZE$ (ha)	57.6	51.1	0.0	994.9	32.1
$NNUMBER$	36.3	20.0	0.0	706.0	56.4
$NAREA$ (ha)	3,011.3	1,929.4	54.2	75,740.9	3,971.2
$NDENSITY$ (ha^{-1})	0.013	0.010	0.000	0.201	0.012
Neighbors in farmers' own and adjacent municipalities					
$N\overline{PROFIT}$ (k€)	14.4	12.3	-566.0	238.7	8.7
$NSIZE$ (ha)	57.4	52.0	0.1	256.2	26.7
$NNUMBER$	217.3	146.0	0.0	3,064.0	254.5
$NAREA$ (ha)	18,815.3	14,608.2	138.9	192,119.1	16,635.1
$NDENSITY$ (ha^{-1})	0.011	0.010	0.000	0.091	0.007

Note: $N\overline{PROFIT}$ and $NSIZE$ are computed over all farmers in the neighborhood, including farmers over 50 years old, and the $NSIZE$ also accounts for all farmers paying a flat-rate social security tax located in the neighborhood. This explains why the minimum of $N\overline{PROFIT}$ over neighbors in farmers' own municipality is smaller than the minimum of farmers' own profit.

0; Φ is the standard normal cumulative distribution; $X_{i,t}$ and $NZ_{i,t}$ are vectors of explanatory variables relative to farmer i and her/his neighbors, respectively; α_t and α_{d_i} are dummies specific to year t and the region d_i where i operates;[6] and β_0, β_1 and β_2 are vectors of parameters to be estimated. The argument of function Φ is the expected utility of exit $\mathbb{E}U$. Building on the results of Storm et al. (2015), who run similar regressions and find virtually identical results for a model controlling for spatial autocorrelation and models which do not, we ignore unobserved spatial correlation in this draft.

In section 3, we consider various specifications for the vectors X and NZ. In all these specifications, the vector X contains the control variables $AGECAT$, $ASSOCIATESCAT$, $MARITAL$, and $OFFFARM$, SPE, an interaction term $SPE \times SIZE$ allowing the influence of area to differ across specializations, our main variable of interest $\overline{PROFIT}$, and cross-effects between $\overline{PROFIT}$ and AGE, $SIZE$ and/or $ASSOCIATES$ depending on the specification. The vector NZ contains the variables $N\overline{PROFIT}$, $NSIZE$ and $NDENSITY$ relative to the neighbors and interaction terms depending on the specification. The robustness of the estimates of the neighborhood effects is assessed over the four definitions of neighbors defined in subsection 1.2.

We first consider a series of specifications of the model with no neighborhood effect, namely, where $\beta_2 = 0$, in which we interact $\overline{PROFIT}$ with AGE, $SIZE$ and $ASSOCIATES$, as we expect the influence of profit to depend on these farmer characteristics. The results of these estimations are reported in subsection 3.1.

Second, we add neighborhood effects, including $N\overline{PROFIT}$, $NSIZE$, and $NDENSITY$, as well as interaction terms between $\overline{PROFIT}$ and AGE, $SIZE$ and $ASSOCIATES$, to test whether the influence of neighbors' profits

[6] These regions are the 95 French administrative counties ("'départements").

depends on the farmer's own characteristics. These estimations are reported in subsection 3.2.

Third, we test for the existence of a comparison effect between farmers' own characteristics and those of their neighbors. To do so, we allow for own and neighbors' profit and size to have a different influence depending on whether the farmer is above or below the average of the neighborhood. To avoid any discontinuity in the expected utility function around the neighbors' average, we consider a term representing the difference between a farmer's characteristic $Y \in \{\overline{PROFIT}, SIZE\}$ and the average NY among her/his neighbors. Let Δ be the difference operator such that $\Delta Y \equiv Y - NY$ is the relative value of Y. Since ΔY is a linear combination of Y and NY, we cannot separately identify the effects of Y, NY and ΔY. Therefore, we do not attempt to test which effect dominates among the respective influences of the absolute value of Y and the relative values of ΔY.[7] However, we can test whether the result from the life satisfaction literature according to which the slope of the effect of relative economic performance is greater for individuals situated below the average of their neighbors applies to our case. Let us consider the notation $(Y)^- \equiv Y \times \mathbb{1}\{Y < 0\}$. In this last specification, we test whether the terms $(\Delta\overline{PROFIT})^-$ and $(\Delta SIZE)^-$ significantly influence the probability of exit. We report these last estimations in subsection 3.3, analyze the distributions of the estimated marginal effect in subsection 3.4 and exploit them to simulate a shock to all profits in subsection 3.5.

3 Results

3.1 Heterogeneous influence of own profit

We first investigate how the influence of profits on the probability of exit varies across farmers' characteristics. To do so, we successively interact the average profit with the cultivated area, the age, and the number of associates of each farmer. Table 3 reports the estimated coefficients of the corresponding probit models.

Figure 3 in the Appendix displays the distribution of the estimated probability of exit $\widehat{Prob(EXIT)}$ in the specification corresponding to column (5) conditional on observed exit, and it shows that this distribution is shifted to the right for exiting farmers.[8] To assess how well our model compares to random classifiers, we report the receiver operating characteristic (ROC) curve. The ROC curve plots the true-positive rate against the false-positive rate when viewing the fitted probabilities as scores determining whether to classify an observation as an exit or not, and varying the threshold of this classifier between 0 and 1. It has long been a standard tool to evaluate classifiers in various fields, such as medicine, psychology and meteorology, and has been more recently used in economics

[7] The dominance of the effect of relative income on life satisfaction is reported by Vendrik and Woltjer (2007).

[8] The estimated probabilities of exit are low for all farmers but are significantly higher for exiting farmers. The average among exiting farmers is 0.0288 against 0.0086 among stayers. A t-test rejects the equality of these means at the 0.1% level.

Table 3: Estimates of the probit model excluding neighbors' variables

	Dependent variable: $EXIT$				
	(1)	(2)	(3)	(4)	(5)
$ASSOCIATESCAT$: 1	-3.95e-01 ***	-3.96e-01 ***	-3.94e-01 ***	-3.96e-01 ***	-3.98e-01 ***
$ASSOCIATESCAT$: 2+	-6.57e-01 ***	-6.57e-01 ***	-6.53e-01 ***	-6.62e-01 ***	-6.62e-01 ***
$AGECAT$: 25-29	1.02e-02	1.29e-02	1.97e-02	9.87e-03	2.19e-02
$AGECAT$: 30-34	6.38e-02 *	6.82e-02 *	7.43e-02 **	6.32e-02 *	7.76e-02 **
$AGECAT$: 35-39	1.10e-01 ***	1.15e-01 ***	1.11e-01 ***	1.09e-01 ***	1.16e-01 ***
$AGECAT$: 40-44	1.21e-01 ***	1.26e-01 ***	1.08e-01 ***	1.20e-01 ***	1.13e-01 ***
$AGECAT$: 45-49	1.32e-01 ***	1.37e-01 ***	1.02e-01 ***	1.31e-01 ***	1.08e-01 ***
$MARITAL$: Married	8.65e-03	9.23e-03	7.63e-03	8.68e-03	8.35e-03
$MARITAL$: Separated	4.11e-01 ***	4.13e-01 ***	4.08e-01 ***	4.11e-01 ***	4.11e-01 ***
$MARITAL$: Widowed	3.12e-01 ***	3.13e-01 ***	3.11e-01 ***	3.12e-01 ***	3.12e-01 ***
$IMPFARMING$: Main	4.10e-01 ***	4.07e-01 ***	4.09e-01 ***	4.10e-01 ***	4.06e-01 ***
$IMPFARMING$: Secondary	3.65e-01 ***	3.52e-01 ***	3.63e-01 ***	3.65e-01 ***	3.48e-01 ***
SPE : Dairy cattle	3.84e-02 *	4.03e-02 *	3.91e-02 *	3.85e-02 *	4.12e-02 *
SPE : Field crops	-3.03e-02	-2.33e-03	-2.94e-02	-3.04e-02	-5.07e-04
SPE : Fruits and vegetables	3.65e-01 ***	3.68e-01 ***	3.65e-01 ***	3.65e-01 ***	3.69e-01 ***
SPE : Mixed	6.32e-02 ***	6.67e-02 ***	6.39e-02 ***	6.31e-02 ***	6.74e-02 ***
SPE : Other livestocks	4.98e-01 ***	4.77e-01 ***	4.93e-01 ***	4.98e-01 ***	4.70e-01 ***
SPE : Other permanent crops	3.00e-01 ***	2.89e-01 ***	2.97e-01 ***	3.00e-01 ***	2.89e-01 ***
SPE : Pigs and poultry	2.78e-01 ***	2.79e-01 ***	2.79e-01 ***	2.78e-01 ***	2.81e-01 ***
SPE : Sheeps and goats	2.08e-01 ***	2.04e-01 ***	2.08e-01 ***	2.08e-01 ***	2.03e-01 ***
SPE : Vineyards	7.93e-02 ***	8.87e-02 ***	8.16e-02 ***	7.93e-02 ***	9.21e-02 ***
$SIZE$	-4.39e-03 ***	-4.69e-03 ***	-4.37e-03 ***	-4.39e-03 ***	-4.67e-03 ***
$SIZE \times SPE$: Dairy cattle	3.79e-04	3.52e-04	3.76e-04	3.76e-04	3.48e-04
$SIZE \times SPE$: Field crops	1.52e-03 ***	1.02e-03 ***	1.51e-03 ***	1.52e-03 ***	9.98e-04 ***
$SIZE \times SPE$: Fruits and vegetables	-4.47e-03 ***	-4.40e-03 ***	-4.49e-03 ***	-4.48e-03 ***	-4.38e-03 ***
$SIZE \times SPE$: Mixed	2.44e-04	1.61e-04	2.41e-04	2.44e-04	1.57e-04
$SIZE \times SPE$: Other livestocks	-5.40e-03 ***	-4.89e-03 ***	-5.32e-03 ***	-5.40e-03 ***	-4.75e-03 ***
$SIZE \times SPE$: Other permanent crops	-6.03e-03 ***	-5.20e-03 ***	-5.84e-03 ***	-6.03e-03 ***	-5.13e-03 ***
$SIZE \times SPE$: Pigs and poultry	-4.50e-03 ***	-4.48e-03 ***	-4.54e-03 ***	-4.50e-03 ***	-4.52e-03 ***
$SIZE \times SPE$: Sheeps and goats	5.07e-04	5.71e-04	5.02e-04	5.07e-04	5.68e-04
$SIZE \times SPE$: Vineyards	-2.03e-03 ***	-2.00e-03 ***	-2.04e-03 ***	-2.03e-03 ***	-2.01e-03 ***
$\overline{PROFIT}$	-7.54e-03 ***	-9.53e-03 ***	-2.29e-02 ***	-7.75e-03 ***	-2.55e-02 ***
$\overline{PROFIT}^2$	4.29e-06 ***	-2.61e-06 **	5.47e-06 ***	4.24e-06 ***	-3.84e-06 ***
$\overline{PROFIT} \times SIZE$		3.22e-05 ***			3.32e-05 ***
$\overline{PROFIT} \times AGE$			3.58e-04 ***		3.59e-04 ***
$\overline{PROFIT} \times ASSOCIATES$				1.77e-04	3.65e-04 ***
Year dummies	Yes	Yes	Yes	Yes	Yes
Region dummies	Yes	Yes	Yes	Yes	Yes
Number of observations	2,272,158	2,272,158	2,272,158	2,272,158	2,272,158
Number of exits	20,260	20,260	20,260	20,260	20,260
AUROC	0.7976	0.7979	0.7985	0.7975	0.7987
Log-likelihood	-102,710	-102,588	-102,647	-102,710	-102,538

*Note: *, **, and *** indicate statistical significance at the 10, 5, and 1% level.*

to evaluate financial crisis models (Berge and Jordà 2011; Schularick and Taylor 2012; Anundsen et al. 2016).[9] The ROC curve corresponding to the specification in column (5) is plotted in Figure 4 in the Appendix, and the area under the ROC curve (AUROC) is given for each specification in Table 3. An AUROC value of 0.5 corresponds to a random coin toss classifier, whereas we obtain values close to 0.8, indicating significant explanatory power.[10] Our AUROC values lie close to those reported in the recent applications in economics cited above.

The estimated coefficients of the control variables take signs that are overall consistent with the literature. The probability of exit is lower for farmers with associates and older farmers. Our nonlinear specification of the influence of age reveals that the probability of exit increases rapidly until 35 and then continues to increase but at a slower rate. Marriage is associated with neither a lower nor a higher probability of exit, but separated and widowed farmers have a significantly higher probability of exit. In contrast with the conclusions of Kimhi (2000), we find that part-time farmers have a higher probability of exit than full-time farmers, a result in line with the conclusions of Goetz and Debertin (2001). The probability of exit depends significantly on the specialization of the farmer. Consistent with the literature (Weiss 1999; Dong et al. 2016; Storm et al. 2015), we find that larger farms have a smaller probability of early exit, although the slope of this relationship depends on the specialization of the farmer.

As expected, our main variable of interest $\overline{PROFIT}$ decreases the probability of early exit. The estimates reported in columns (2)-(5) show that the marginal effect of $\overline{PROFIT}$ is negative and increases toward zero when age and size increase.[11] Although the interaction between the average profit and the number of associates is statistically significant in column (5), it is less economically significant as $ASSOCIATES$ varies little in the data ($ASSOCIATES \in \{0, 1, 2\}$ for 96% of the observations). Overall, the negative marginal effect of profits on the expected utility of exit, hereafter denoted $\frac{\partial \mathbb{E}U}{\partial \overline{PROFIT}}$, is stronger for younger farmers and farmers operating a smaller area and slightly stronger for farmers with no associates *ceteris paribus*. Note that the sign of the quadratic effect of profit changes depending on the specification considered. Although it is statistically significant in all columns, this quadratic term does not quantitatively affect the marginal influence of profit on the expected utility of exit;[12] hence, we do not include this term in the next specifications we consider. We provide a graphical illustration of how the cross-effects between profit and farmers' characteristics affect the distribution of $\frac{\partial \mathbb{E}U}{\partial \overline{PROFIT}}$ in section 3.4.

[9] See Berge and Jordà (2011) for a thorough discussion on the advantages of the ROC curve for the evaluation of classification models.

[10] For the specification in column (5), the 95% confidence interval for the value of the AUROC computed with the DeLong et al. (1988) algorithm is $[0.7956 - 0.8018]$.

[11] The full specification in column (5) implies that the marginal effect of $\overline{PROFIT}$ is positive for 99.54% of observations.

[12] Considering the estimates given column (5), the marginal influence of the quadratic profit (-3.84e-06$\times 2 \times \overline{PROFIT}$) is equal to 1.9% of the total marginal effect of profit $\frac{\partial \mathbb{E}U}{\partial \overline{PROFIT}}$ on average across all observations. The median of the ratio between these two terms is 1%.

3.2 Heterogeneous neighborhood effects

In this section, we present the estimated coefficients of probit models, including the neighbors' variables, with the two aforementioned definitions of neighborhood. The estimates for the variables of interest are reported in Table 4, where all specifications include all the control variables shown in Table 3 and dummies for each year and each region.

The signs and significance levels of the estimates for the three spatially lagged variables are the same under both definitions of neighbors.[13] The coefficient on the density of farmers' neighbors is always negative and strongly significant. This reveals that farmers in areas where the density of farmers is high have a lower probability of early exit and suggests positive agglomeration effects. In these specifications, the average size of the neighbors is estimated to have a positive effect on the probability of exit, a result in contrast to the estimates of Storm et al. (2015) but in line with those of Saint-Cyr et al. (2019), who also find a positive effect on average. Neighbors' average profit is found to have a negative effect on a farmer's probability of early exit similar to the effect of farmer's own profit, suggesting positive spillovers. All these effects are robust to both definitions of neighbors, even when considering only neighbors with the same production specialization as the farmer, that is, ignoring neighboring farms with different specializations than the farmer (see Table 7 in the Appendix).

Table 4: Estimates of the probit model accounting for neighbors' influence

	Dependent variable: $EXIT$			
Neighborhood definition:	Same municipality only		Same and adjacent municipalities	
	(1)	(2)	(3)	(4)
$\overline{PROFIT}$	-2.37e-02 ***	-2.26e-02 ***	-2.34e-02 ***	-2.27e-02 ***
$\overline{PROFIT} \times SIZE$	2.73e-05 ***	2.66e-05 ***	2.71e-05 ***	2.66e-05 ***
$\overline{PROFIT} \times AGE$	3.31e-04 ***	3.12e-04 ***	3.26e-04 ***	3.08e-04 ***
$\overline{PROFIT} \times ASSOCIATES$	3.62e-04 ***	1.22e-04	3.55e-04 **	4.09e-04 **
$NDENSITY$	-1.12e+00 ***	-9.42e-01 ***	-1.81e+00 ***	-1.74e+00 ***
$NSIZE$	9.65e-04 ***	9.55e-04 ***	1.63e-03 ***	1.50e-03 ***
$N\overline{PROFIT}$	-3.26e-04 **	-6.04e-03 ***	-2.64e-03 ***	-8.54e-03 ***
$N\overline{PROFIT} \times SIZE$		9.61e-05 ***		1.19e-04 **
$N\overline{PROFIT} \times AGE$		1.63e-05 ***		3.50e-05 ***
$N\overline{PROFIT} \times ASSOCIATES$		3.72e-04 **		-1.55e-04
All control variables	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Region dummies	Yes	Yes	Yes	Yes
Number of observations	2,233,371	2,233,371	2,271,539	2,271,539
Number of exits	19,863	19,863	20,239	20,239
AUROC	0.7984	0.7985	0.7992	0.7992
Log-Likelihood	-100,598	-100,586	-102,389	-102,377

*Note: *, **, and *** indicate statistical significance at the 10, 5, and 1% level.*

[13] We now consider specifications without a quadratic term for profit, given its non-significance in the full specification presented in column (5) of Table 3. Including this term does not qualitatively affect our results.

Columns (2) and (4) report the estimated coefficients of the cross-effects between the average profit of the neighbors and a farmer's size, age and number of associates. We find that the cross-effects with size and age are positive and statistically significant under both definitions of neighborhood, while the cross-effect with the number of associates is statistically significant only when including adjacent municipalities in the neighborhood. The corresponding estimates ignoring neighbors with different specializations are reported in Table 7 in the Appendix, where only the cross-effect with farmer's age is statistically significant at the conventional 5% level. Overall, we find evidence that younger farmers benefit more than older farmers from the profit spillover from neighbors. These cross-effects also imply that the sign of this spillover depends on the farmer's characteristics. Using the specification of column (4) of Table 4, we find that the marginal profit spillover $\frac{\partial \mathrm{EU}}{\partial N\overline{PROFIT}}$ is positive for 16.0% of observations. An in-depth commentary on the distribution of this effect is provided in subsection 3.4 using the fully specified model presented in the next section.

3.3 Nonlinear comparison effects

In a last series of estimations, we relax the linearity assumption of the neighborhood effects and allow the effect of neighbors' profit and size to differ depending on whether the farmer is below or above the average of the neighborhood. As presented in section 2, we test whether the asymmetric deviations $(\Delta\overline{PROFIT})^-$ and $(\Delta SIZE)^-$ significantly influence the probability of exit. We obtain nonlinear and heterogeneous marginal effects of own and neighbors' profit and size.

Table 5 reports various specifications testing for asymmetries in the effect of own and neighbors' profits and size. The coefficients on the asymmetric terms are negative and strongly significant in all cases, even when considering only neighbors with the same specialization (see Table 8 in the Appendix). They imply that the marginal effects of profit and size are nonlinear and more negative for farmers below the respective averages of their neighbors. We hence provide evidence of a comparison effect between farmers and their neighbors that is nonlinear and stronger among farmers who are below their neighbors' average. This is closely related to a result reported several times in the economic literature on happiness, according to which the function mapping relative income to life satisfaction is significantly steeper for negative than for positive values of relative income (Ferrer-i Carbonell 2005; Vendrik and Woltjer 2007; Senik 2009). This asymmetric effect is consistent with the broader view in prospect theory according to which individuals pay more attention to their position relative to their social reference point when they are below it than above it, hence being more sensitive to losses and disadvantages than to gains and advantages (Tversky and Kahneman 1991).

Both cross-effects with the number of associates become statistically non-significant in the full specification of

Table 5: Estimates of the probit model with asymmetric neighbors' influence

	Dependent variable: $EXIT$					
Neighborhood definition:	Same municipality only			Same and adjacent municipalities		
	(1)	(2)	(3)	(4)	(5)	(6)
$\overline{PROFIT}$	-1.89e-02 ***	-2.19e-02 ***	-1.91e-02 ***	-1.69e-02 ***	-2.21e-02 ***	-1.72e-02 ***
$\overline{PROFIT} \times SIZE$	2.30e-05 ***	2.20e-05 ***	1.96e-05 ***	1.96e-05 ***	2.07e-05 ***	1.54e-05 ***
$\overline{PROFIT} \times AGE$	2.86e-04 ***	3.04e-04 ***	2.84e-04 ***	2.74e-04 ***	3.02e-04 ***	2.74e-04 ***
$\overline{PROFIT} \times ASSOCIATES$	-1.92e-04	8.75e-05	-1.58e-04	1.41e-04	4.95e-04 **	2.67e-04
$NDENSITY$	-1.15e+00 ***	-8.04e-01 **	-9.77e-01 ***	-1.98e+00 ***	-9.73e-01	-1.21e+00 *
$NSIZE$	8.88e-04 ***	-2.98e-03 ***	-2.92e-03 ***	1.58e-03 ***	-2.71e-03 ***	-2.52e-03 ***
$N\overline{PROFIT}$	-1.19e-02 ***	-7.65e-03 ***	-1.22e-02 ***	-1.64e-02 ***	-1.01e-02 ***	-1.70e-02 ***
$N\overline{PROFIT} \times SIZE$	1.97e-04 ***	1.26e-04 ***	2.04e-04 ***	2.14e-04 ***	1.42e-04 ***	2.26e-04 ***
$N\overline{PROFIT} \times AGE$	1.32e-05 ***	2.49e-05 ***	2.25e-05 ***	3.43e-05 ***	4.81e-05 ***	4.81e-05 ***
$N\overline{PROFIT} \times ASSOCIATES$	6.50e-04 ***	4.07e-04 ***	6.29e-04 ***	1.54e-04	-3.25e-04	2.95e-06
$(\Delta\overline{PROFIT})^-$	-3.25e-03 ***		-2.54e-03 ***	-5.85e-03 ***		-5.08e-03 ***
$(\Delta SIZE)^-$		-5.24e-03 ***	-5.09e-03 ***		-6.24e-03 ***	-6.03e-03 ***
All control variables	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Region dummies	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	2,233,371	2,233,371	2,233,371	2,271,539	2,271,539	2,271,539
Number of exits	19,863	19,863	19,863	20,239	20,239	20,239
AUROC	0.799	0.7997	0.8001	0.8003	0.8007	0.8016
Log-likelihood	-100,549	-100,370	-100,350	-102,296	-102,103	-102,040

*Note: *, **, and *** indicate statistical significance at the 10, 5, and 1% level.*

column (6), which suggests that the significance of these interactions indicated in the previous tables may be spurious. Interestingly, when accounting for the asymmetric influence of relative size in columns (2), (3), (5) and (6), the effect of the absolute neighbors' size ($NSIZE$) on exit becomes negative and hence takes the same sign as that of the absolute neighbors' profit. Our estimates imply that the net marginal effect of neighbors' size is positive for farmers operating a larger area than their neighbors and negative for those operating smaller farms. Following the finding of Saint-Cyr et al. (2019) that neighbors' size conveys both a negative spillover stemming from accrued land competition and a positive spillover due to agglomeration benefits, we obtain that the net effect is detrimental for smaller farmers and beneficial for larger farmers. We comment on the distribution of the net effect of $\overline{PROFIT}$ and $N\overline{PROFIT}$ in the next subsection.

By accounting for this heterogeneity in the spillovers, we show that both the average size and profits of neighbors can convey positive and negative spillovers. Overall, our findings are consistent with the hypothesis that the positive spillovers associated with the benefits of agglomeration are mainly conveyed by the absolute value of neighbors' profit and size, whereas the negative spillover due to fiercer land competition and comparison effects affect farmers mainly through their relative values. Although we do not claim to formally test that hypothesis, our nonlinear framework does reveal that the vast majority of farmers above their neighbors' average are both less sensitive to their relative performance and positively affected by their neighbors' average performance. Accounting for all interactions, 91% of the farmers above their neighbors' average profit are positively affected by it, while 100% of the farmers above their neighbors' average size are positively affected by it.

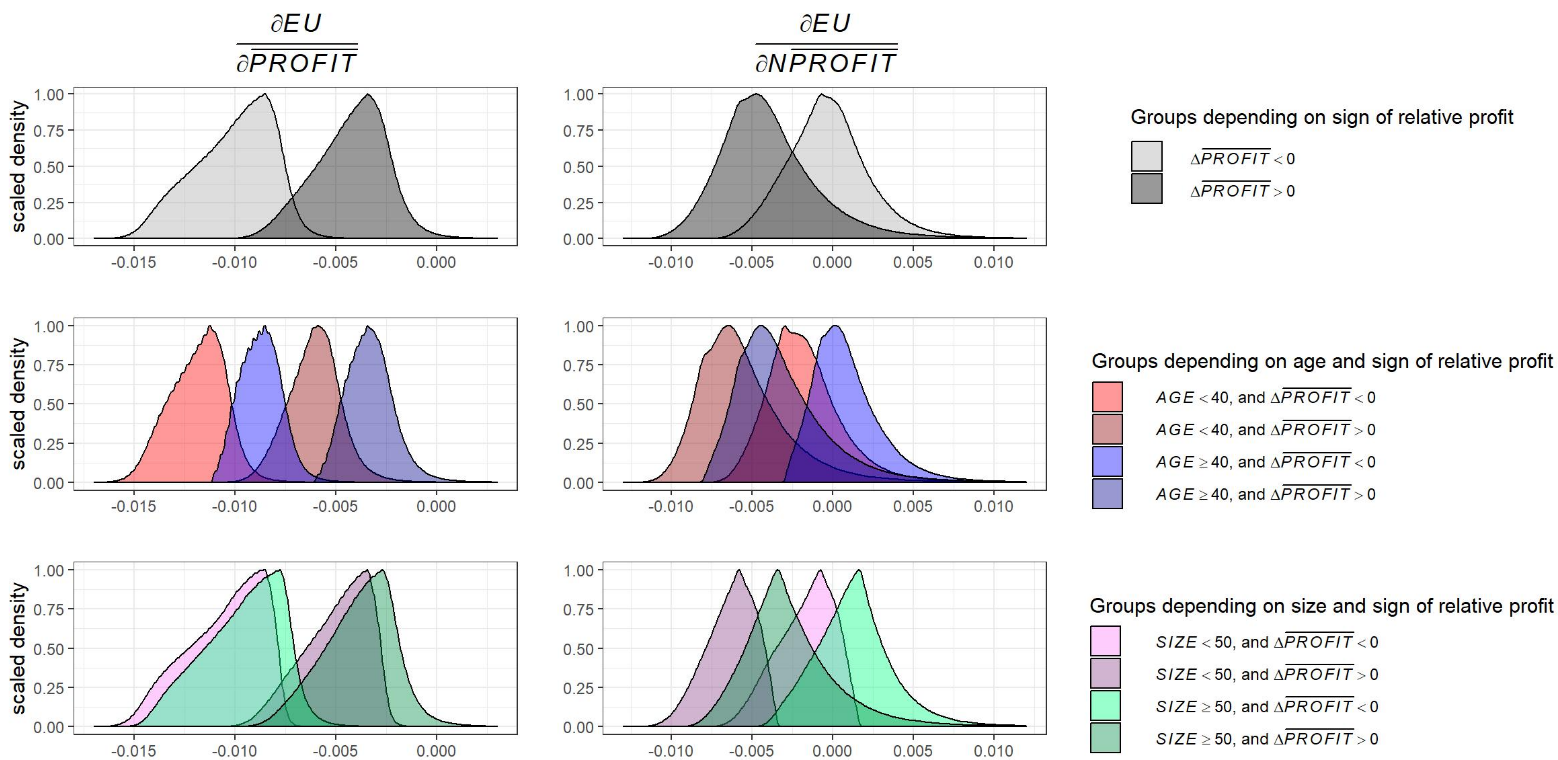
3.4 Distribution of the heterogeneous effects of own and neighbors' profit

In this section, we comment on the respective distributions of the net effects of own and neighbors' profit among the farmers in the sample. We henceforth consider the full model corresponding to column (6) of Table 5. Figure 1 displays the respective scaled densities of the net marginal effect of own (left panels) and neighbors' profit (right panels) on a farmer's expected utility of exit, denoted $\frac{\partial \mathbb{E}U}{\partial \overline{PROFIT}}$ and $\frac{\partial \mathbb{E}U}{\partial N\overline{PROFIT}}$.

The two top panels show these densities for two groups of farmers, those above and below their neighbors' average profit. In the top-left panel, we can see a clear difference between the two densities, with the average marginal effect of own profit being more than twice as large for the farmers below their neighbors' average profit (-0.010 against -0.004).[14] The sign of the relative profit also significantly shifts the marginal effect of neighbors' profits, although the two densities in the top-right panel largely overlap. As mentioned above, for the vast majority (91%) of farmers above the average profit of their neighbors, $\frac{\partial \mathbb{E}U}{\partial N\overline{PROFIT}}$ is negative, whereas it is positive for a large share

[14]These means are significantly different at the 0.1% level.

Figure 1: Distribution of the marginal effects of own and neighbors' profits on the expected utility of exit



(43%) of farmers under their neighbors' average profit. Overall, we find that 28% of farmers suffer from a net adverse spillover (increased expected utility of exit) from their neighbors' profits. Of these farmers, 85% have lower profits than their neighbors.

We then further disaggregate the sample to illustrate how age also significantly contributes to explaining the heterogeneity of the estimated marginal effects. In the middle panels, we subdivide the sample into four groups depending on both the sign of the relative profit and whether the age category is below or above 40, a value close to the median age in our sample. We obtain four distinct densities of $\frac{\partial \mathbf{E}U}{\partial PROFIT}$, while the densities of $\frac{\partial \mathbf{E}U}{\partial NPROFIT}$ overlap more across the four groups. The explanatory power of age is substantial, as the four densities are spread in a balanced way, although the sign of the relative profit has more explanatory power for the heterogeneity of the marginal effects. For instance, the average marginal effect of own profit is smaller in absolute value for farmers under 40 and above their neighbors' average profit than for older farmers with lower profits than their neighbors (0.0060 against 0.0087)[14]. The densities displayed in the middle-right panel show that age also significantly explains the distribution of the net marginal effect of neighbors' profits. Most of the farmers with a positive marginal effect of neighbors' profits (82%) are above age 40.

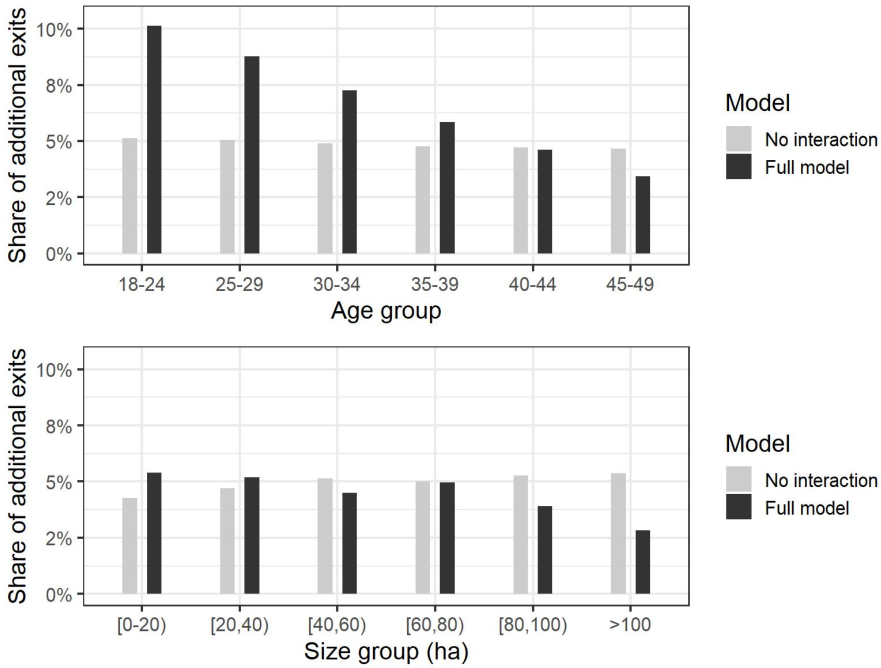
In the bottom panels, we similarly consider groups based on size category (more or less than 50 ha, a value close to the median size in our sample) and the sign of relative profits. The densities substantially overlap, especially those of $\frac{\partial \mathbf{E}U}{\partial PROFIT}$ in the bottom-left panel. However, size has significant explanatory power for the heterogeneity of the marginal effect of neighbors' profit. In our sample, 82% of the farmers receiving an adverse spillover from their neighbors' profit operate an area larger than 50 ha, while the two categories of size are rather balanced among farmers receiving a favorable spillover (56% of farmers under 50 ha and 44% above that figure).

3.5 Simulation of a shock to all profits

Finally, we illustrate how this uncovered heterogeneity translates into exit decisions. We simulate a shock to all profits where we decrease all profits by a value equal to 10% of the standard deviation of profits (1,860€). Such a decrease in agricultural profits could be generated by a decrease in payments received from the CAP, which is not an unlikely scenario given the decreasing trend of the CAP budget.

Figure 2 shows the share of additional early exits generated by such a shock to profits depending on age and size groups for two different specifications of the model. We compare the results using the full model corresponding to the estimates in column (6) of Table 5 and discussed in the previous subsection to a specification that also includes own profit and neighbors' profit, size and density but with no interaction between profits and farmer

Figure 2: Distribution of the effect of decreasing profits by 0.1 standard deviation



characteristics.[15] The number of exits increases in each category and for each specification, but ignoring the interactions leads to substantial underestimates of the share of additional early exits among younger farmers and substantial overestimates of the share of additional early exits among farmers operating large areas. The results of this simulation suggest that reducing agricultural profit-supporting policies would generate more exits among younger and smaller farmers, hence accelerating the aging and concentration process already at work in the farming sector in France.

4 Conclusion

This article provides an empirical examination of the heterogeneous influences of profit, neighbors' characteristics and relative economic performance on farmers' exit. To this end, we explore a large annual panel data set at the farmer level over a period of 14 years produced by the French authority for farmer health care and social security.

Our contribution in this article is threefold. First, we examine the heterogeneity of the effect of a farmer's own profit on the decision to exit. Our empirical analysis reveals that this effect is negative and more important in absolute value for younger farmers and farmers operating smaller areas. Second, we investigate the influence of neighbors' characteristics on exit. Using a variety of definitions of neighbors, our estimates consistently show that neighbors' average profits have a stronger influence on the exit decision of younger farmers. We also pro-

[15]This specification corresponds to that displayed in column (1) of Table 4 but without the interaction terms with $\overline{PROFIT}$.

vide evidence that smaller farmers are significantly more sensitive to their neighbors' average profits. Third, we uncover an asymmetry in the influence of relative profit and size. Our estimations reveal that the effects of these relative values depend on whether the farmer is below or above the average of his/her neighbors. For both profit and size, the effects of the relative values are stronger for farmers below the average of their neighbors. This finding is consistent with the conjecture of prospect theory according to which the value function is asymmetric and steeper for values defined as negative with respect to some reference point, a postulate strongly corroborated by the empirical literature on relative income. Here, the reference point is the average profit and size of the neighbors. Finally, we simulate a shock to profits to illustrate how this heterogeneity influences the distribution of exits. Our results are consistent with the view that both positive and negative spillovers pass through both the profit and the size of the neighbors and in a heterogeneous way among farmers. The direction of the net effect depends on farmers' characteristics.

Our framework opens a promising avenue to disentangle the effects of the absolute performance of farmers and their neighbors from that of relative performance and to explore whether one effect dominates. Accounting for these comparison effects should allow us to refine the evaluation of agricultural policies, especially with respect to their distributional outcome.

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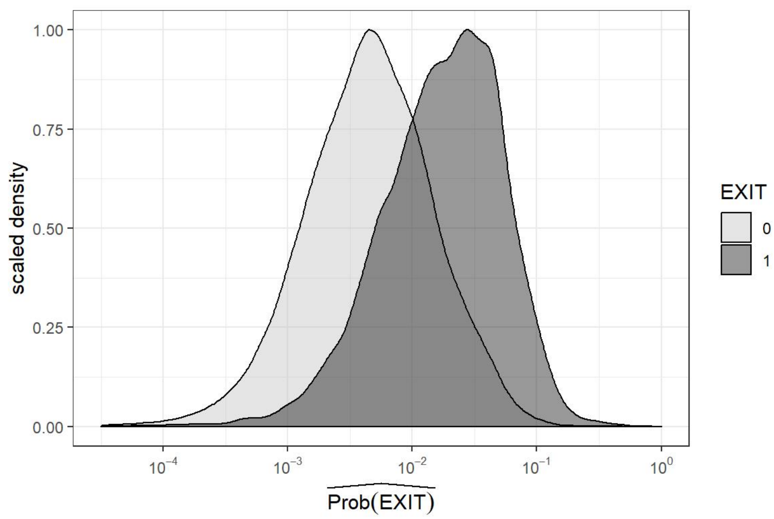
Appendix

Table 6: Summary statistics of neighbors with the same specialization

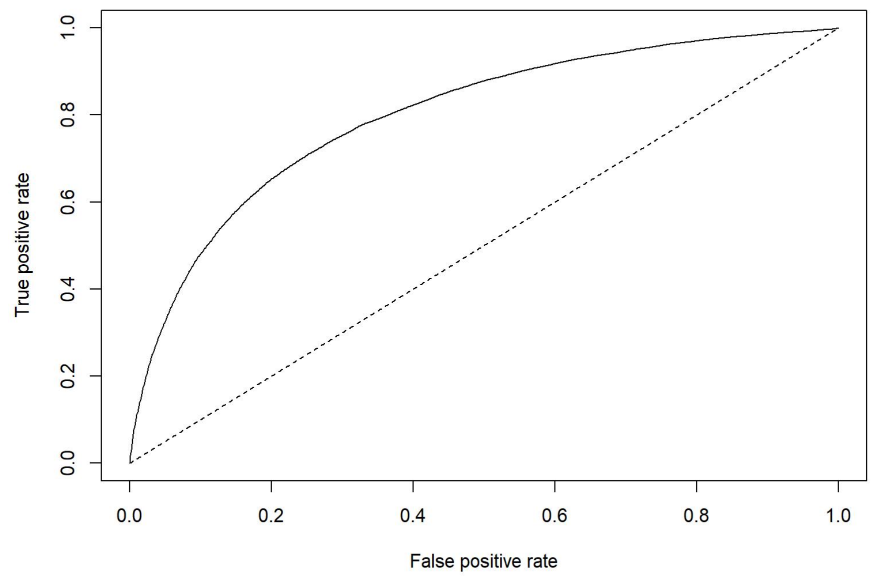
Variable (unit)	Mean	Median	Min.	Max.	S.d.
Neighbors in a farmer's own municipality with the same specialization as the farmer					
$\overline{NPROFIT}$ (k€)	13.0	10.8	-704.6	773.6	12.7
$NSIZE$ (ha)	58.2	51.0	0.0	994.9	37.3
$NNUMBER$	15.2	7.0	0.0	254.0	23.8
$NAREA$ (ha)	3,011.3	1,929.4	54.2	75,740.9	3,971.2
$NDENSITY$ (ha^{-1})	0.006	0.004	0.000	0.201	0.011
Neighbors in a farmer's own and adjacent municipalities with the same specialization as the farmer					
$\overline{NPROFIT}$ (k€)	14.6	12.3	-2,056.9	333.8	10.6
$NSIZE$ (ha)	30.6	25.1	-25.5	333.4	24.2
$NNUMBER$	85.7	49.0	0.0	896.0	102.1
$NAREA$ (ha)	18,815.3	14,608.2	138.9	192,119.1	16,635.1
$NDENSITY$ (ha^{-1})	0.005	0.004	0.000	0.090	0.006

Figure 3: Distribution of the fitted probability of exit in the specification presented in column (5) of Table 3



Note: The mean of $\widehat{Prob(EXIT)}$ among exiting farmers ($EXIT = 1$) is 0.0288 against 0.0086 among stayers ($EXIT = 0$). A t-test rejects the equality of these means at the 0.1% level. The quantile of order 99.1% of the overall distribution is 0.065.

Figure 4: ROC curve of the model presented in column (5) of Table 3



Note: The area under the curve equals 0.7987, while a random model has a value of 0.5. The ROC curves for the other specifications of the model are virtually identical.

Table 7: Neighbors' influence including only neighbors with the same specialization

	Dependent variable: $EXIT$			
Neighborhood definition:	Same municipality and same specialization		Same and adjacent municipalities and same specialization	
	(1)	(2)	(3)	(4)
$\overline{PROFIT}$	-2.36e-02 ***	-2.41e-02 ***	-2.32e-02 ***	-2.30e-02 ***
$\overline{PROFIT} \times SIZE$	2.68e-05 ***	2.61e-05 ***	2.70e-05 ***	2.64e-05 ***
$\overline{PROFIT} \times AGE$	3.31e-04 ***	3.45e-04 ***	3.21e-04 ***	3.09e-04 ***
$\overline{PROFIT} \times ASSOCIATES$	3.84e-04 ***	3.86e-04 **	3.47e-04 **	6.04e-04 ***
$NDENSITY$	-1.46e+00 ***	-1.38e+00 ***	-4.13e+00 ***	-3.85e+00 ***
$NSIZE$	7.80e-04 ***	6.94e-04 ***	8.14e-05	-1.28e-04
$N\overline{PROFIT}$	-9.65e-04 ***	9.33e-04	-1.01e-03 ***	-3.49e-03 *
$N\overline{PROFIT} \times SIZE$		-6.41e-05 *		5.97e-05
$N\overline{PROFIT} \times AGE$		2.03e-05 ***		3.53e-05 ***
$N\overline{PROFIT} \times ASSOCIATES$		-6.07e-06		-7.46e-04
All control variables	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Region dummies	Yes	Yes	Yes	Yes
Number of observations	1,966,151	1,966,151	2,207,088	2,207,088
Number of exits	15,970	15,970	18,828	18,828
AUROC	0.7904	0.7904	0.7954	0.7954
Log-likelihood	-82,887	-82,877	-96,377	-96,359

*Note: *, **, and *** indicate statistical significance at the 10, 5, and 1% level.*

Table 8: Asymmetric neighbors' influence including only neighbors with the same specialization (same specifications as Table 5)

	Dependent variable: $EXIT$					
Neighborhood definition:	Same municipality and same specialization			Same and adjacent municipalities and same specialization		
	(1)	(2)	(3)	(4)	(5)	(6)
$\overline{PROFIT}$	-2.12e-02 ***	-2.37e-02 ***	-2.13e-02 ***	-1.93e-02 ***	-2.28e-02 ***	-1.95e-02 ***
$\overline{PROFIT} \times SIZE$	2.18e-05 ***	2.21e-05 ***	1.88e-05 ***	2.18e-05 ***	2.42e-05 ***	2.04e-05 ***
$\overline{PROFIT} \times AGE$	3.38e-04 ***	3.40e-04 ***	3.35e-04 ***	2.86e-04 ***	3.05e-04 ***	2.86e-04 ***
$\overline{PROFIT} \times ASSOCIATES$	2.57e-04	4.15e-04 **	3.10e-04 *	5.49e-04 **	6.87e-04 ***	6.35e-04 ***
$NDENSITY$	-1.53e+00 ***	-1.35e+00 ***	-1.48e+00 ***	-4.19e+00 ***	-3.27e+00 ***	-3.60e+00 ***
$NSIZE$	6.09e-04 ***	-2.64e-03 ***	-2.57e-03 ***	-1.11e-04	-1.70e-03 ***	-1.60e-03 ***
$N\overline{PROFIT}$	-1.14e-03	6.45e-04	-1.07e-03	-7.39e-03 ***	-3.89e-03 **	-7.41e-03 ***
$N\overline{PROFIT} \times SIZE$	-6.57e-05 **	-5.98e-05 *	-6.22e-05 *	1.19e-04 ***	6.88e-05 *	1.22e-04 ***
$N\overline{PROFIT} \times AGE$	1.78e-05 ***	2.72e-05 ***	2.48e-05 ***	3.10e-05 ***	4.09e-05 ***	3.70e-05 ***
$N\overline{PROFIT} \times ASSOCIATES$	1.28e-04	-6.50e-05	5.70e-05	-8.84e-04 *	-9.70e-04 **	-1.08e-03 **
$(\Delta\overline{PROFIT})^{-}$	-3.86e-03 ***		-3.26e-03 ***	-4.07e-03 ***		-3.70e-03 ***
$(\Delta SIZE)^{-}$		-4.42e-03 ***	-4.22e-03 ***		-4.84e-03 ***	-4.57e-03 ***
All control variables	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Region dummies	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	1,966,151	1,966,151	1,966,151	2,207,088	2,207,088	2,207,088
Number of exits	15,970	15,970	15,822	18,828	18,828	18,828
AUROC	0.7911	0.7917	0.7872	0.7961	0.7959	0.7965
Log-likelihood	-82,834	-82,745	-82,512	-96,313	-96,282	-96,243

*Note: *, **, and *** indicate statistical significance at the 10, 5, and 1% level.*