What Factors Encourage Intrafamily Farm Succession in Mountain Areas?

Evidence From an Alpine Valley in Italy

Daniele Cavicchioli*, Danilo Bertoni, Federico Tesser, and Dario Gianfranco Frisio

*Corresponding author: daniele.cavicchioli@unimi.it, danielecavi@libero.it
Department of Economics, Management and Quantitative Methods (DEMM), Università degli Studi di Milano, Via G. Celoria 2, 20133 Milan, Italy

Open access article: please credit the authors and the full source.

Introduction

The Food and Agriculture Organization declared 2014 the International Year of Family Farming, pointing out its central role for agriculture and rural development, especially in mountain areas (Wymann von Dach et al 2013). Migration from rural to urban areas is a key feature related to economic development and structural change (Todaro 1969; Mundlak 1979; Lucas 2004). Farming may be essential to preventing or at least slowing outmigration and land abandonment in mountain areas. Furthermore, family farm persistence in disadvantaged areas, like mountains frequently are, is particularly important for protecting and managing the landscape, avoiding environmental degradation, and supporting local economic development (MacDonald et al 2000; Dax 2001). It is therefore important to keep family farming alive in mountain areas.

One element of farm survival is the ability to identify a successor to inherit the family farm (Inwood and Sharp 2012; Mann et al 2013). Agricultural activity on such a farm will hardly be taken over by someone outside the family, given the high investments required and the low profitability to be expected, and family labor lowers production costs compared to hired labor. Moreover, the farm transfer to someone who has not lived on the farm implies the loss of skills and expertise accumulated within the family farm (Corsi 2009). For the previously mentioned reasons, intrafamily farm succession is often a necessary condition for farm survival in less-favored agricultural areas such as mountains. Better knowledge of the farm succession process is therefore of interest for mountain agriculture. Based on an analysis of a group of apple producers in an Italian Alpine valley (Figure 1), the aim of this paper is to add knowledge about intrafamily farm succession in mountain areas by quantifying its extent and identifying factors that may foster or discourage this practice.

The article is structured as follows: The following section reviews previous studies of family farm succession, and the next section summarizes data collection and statistical analysis methods. This is followed by a discussion of the results and a comparison with previous findings. Finally, we draw conclusions and policy implications and suggest future lines of research to extend knowledge of family farm succession to other mountain areas.

Previous studies on family farm succession

Family farm succession and related issues have been explored and summarized extensively (Lobley et al 2012).
These studies may be roughly classified as qualitative (Dumas et al 1995; Keating and Little 1997; Mann 2007b; Otomo and Oedl-Wieser 2009; Inwood and Sharp 2012) or quantitative (Kimhi 1994; Kimhi and Lopez 1999; Stiglbauer and Weiss 2000; Kimhi and Nachlieli 2001; Glauben et al 2004; Simeone 2005, 2006; Aldanondo Ochoa et al 2007; Mann 2007a; Calus et al 2008; Kerbler 2008, 2009, 2012; Mishra and El-Osta 2008; Corsi 2009; Glauben et al 2009; Mishra et al 2010). They examine family farm succession from different perspectives, focusing on the timing and intergenerational component of succession and retirement (Kimhi 1994; Kimhi and Lopez 1999; Glauben et al 2004), the effect of agricultural policy (Mishra and El-Osta 2008) or farm assets (Calus et al 2008), or the effect of intrafamily succession on farm performance (Carillo et al 2013).

One of the main tools of analysis in the quantitative studies is binary-choice dependent-variable regression (probabilistic, referred to as probit, or logistic) that allows quantification of whether and to what extent various characteristics of the family farm (and its individual components) increase or reduce the probability of intrafamily succession. Intrafamily succession is rarely directly observable unless farm-level data are registered over a long time span, like the agricultural census (e.g. Kimhi 1994; Stiglbauer and Weiss 2000). When such information is not available, outcomes are more often deduced from interviews with farmers, family members, or both (Simeone 2005, 2006; Kerbler 2008), or the assumption is made that a farmer’s children working on the farm will take it over. The latter case is represented by the research of Corsi (2009), which used data from the 2000 Italian Agricultural Census in the Piedmont region to study how various farm, farmer, and territorial features influence farm children’s probability of working on the farm (full or part time), using this information as a proxy of farm succession. Among other results, Corsi found that children are 3% more likely to work on farms specializing in fruit, while the probability of this outcome is up to 6.5% higher on mountain farms (other explanatory factors being equal). The Piedmont region is next to the Lombardy region, the location of the present study.

Simeone (2005, 2006) surveyed farms from 2 Italian regions and, going further than Corsi, included some sociodemographic characteristics and attitudes of farmer’s children and partners. Kerbler (2008) surveyed
a large group of family farms in the Slovenian mountains to isolate and measure the effect of their sociogeographic structure on intrafamily succession.

Methodology and results from the previously mentioned papers were used, where possible, to identify and select variables for use in our analysis. Comparisons between our findings and those of previous studies are presented in the Results section.

Data and method of analysis

To study farm succession in our mountain region, we took advantage of a survey carried out in 2010 among 600 farms specializing in fruit and vegetables and belonging to various producer organizations, mainly located in Lombardy in northern Italy (see Frisio et al 2012a, 2012b). We used data from farms in Valtellina, an Alpine valley in Sondrio Province in Lombardy (Figure 2). These farms specialize in apple production under the rules of the “protected geographical indication”—a legally protected place-based product name in the European Union—Mele [apples] di Valtellina and belong to the producer organization Melavi, whose aim is to increase the quality and market value of farm products. The survey covered all full-time farms and a representative sample of part-time farms for a total of 178 family farms.

To examine farm succession, we considered only those 103 farms with at least 1 child older than 15 years. Among these, 27 farms had a child willing to take over the farm, while 75 farms did not (1 respondent did not answer the question). According to these data, only 26.5% of apple farms will have an intrafamily succession; for the previously mentioned reasons, such a low succession rate may raise concerns about the future of apple production in this area. Furthermore, this unbalance between farms with and those without a potential successor may represent a limitation for the analysis; even though the questionnaire contained questions about family farm succession, the survey sampling was designed for other purposes.

To explore farm succession patterns, we selected, following findings from the literature, all relevant farm and farmer characteristics, creating a farm-level data set whose dependent variable (succession) is whether the farmer thinks the next generation will take over the farm. Because the survey was carried out only once (in 2010), we could not observe actual intrafamily succession, so our analysis had to rely on farmers’ expectations. The farm-level data set has the aim of relating these expectations with all relevant and observable farm, family, and farmer (intended as the primary decision-maker) characteristics. Table 1 shows the variables used in the farm-level data set;
Supplemental data, Table S1 (http://dx.doi.org/10.1659/MRD-JOURNAL-D-14-00107.S1) provides detailed descriptive statistics. Variables were coded depending on their placement in 1 of 3 categories:

- **Child** (chld) variables control for the presence of at least 1 child living on the family farm with a certain level of general and agriculture-related education.
- **Farmer** (frmr) variables include sociodemographic characteristics like age, gender, education, information technology skills, and number of children (Glauben et al 2004; Simeone 2005, 2006; Kerbler 2008; Corsi 2009), as well as on-farm work experience and off-farm employment (Aldanondo Ochoa et al 2007; Mishra et al 2010).
- **Farm** (farm) variables include total and rented utilized agricultural area (Simeone 2005, 2006; Kerbler 2008), economic dimensions expressed as annual farm sales (revenues from selling farm products) and total explicit production costs (cost of purchasing production support not provided by the family farm; Glauben et al 2004; Corsi 2009), sales trends over the previous 5 years (Mishra et al 2010), proportion of farm work carried out by family members, and number of children in the farm family.

Several variables were expressed in dichotomous form (eg 1 = yes, 0 = no; 1 = female, 0 = male).

Among the 103 family farms examined, there were 196 children. Of these children, 34 (17.6%) were willing to take over the farm while 159 were not (there were 3 missing answers). We used survey data on individual children to create a child-level data set to explore the data variability within each family farm. The farm- and child-level data sets share the same farm and farmer’s information, while the latter is more data rich.

### TABLE 1

| Category | Code       | Description                                                                 | Unit of measure |
|----------|------------|-----------------------------------------------------------------------------|-----------------|
| Farmer   | Succession | Farmer thinks the next generation will take over the farm                   | 1 = yes; 0 = no |
| Child    | chldschool | At least 1 child has a high school diploma                                 | 1 = yes; 0 = no |
| Child    | chldschoolagr | At least 1 child has a high school diploma in agriculture                   | 1 = yes; 0 = no |
| Child    | chldlivfarm | At least 1 child lives on the farm                                           | 1 = yes; 0 = no |
| Farmer   | Farmer children | Number of farmer’s children                                                 | Number         |
| Farmer   | frmage     | Farmer’s age                                                                 | Years          |
| Farmer   | frmrgender | Farmer’s gender                                                             | 1 = female; 0 = male |
| Farmer   | frmrschool | Farmer has at least a high school diploma                                   | 1 = yes; 0 = no |
| Farmer   | frmrexper  | Farmer’s years of working experience on the farm                            | years          |
| Farmer   | frmroff    | Farmer works off-farm                                                       | 1 = yes; 0 = no |
| Farmer   | frmroff%   | Farmer’s off-farm workdays as a proportion of all workdays                  | %              |
| Farmer   | Farmer PC  | Farmer uses a personal computer                                             | 1 = yes; 0 = no |
| Farm     | Farm children | Number of children on the family farm                                       | Number         |
| Farm     | Farm sales variables | Annual amount of farm sales: revenues from selling farm products          | Classes        |
| Farm     | farmsalesincr | Farm sales have increased over the last 5 years                           | 1 = yes; 0 = no |
| Farm     | farmhectar | Utilized agricultural area on the farm                                      | Hectares       |
| Farm     | fardnt      | Proportion of farm’s utilized agricultural area that is rented              | %              |
| Farm     | farmcosts   | Total farm-explicit production costs                                        | US$            |
| Farm     | farmemploy  | Workdays of nonfamily members as a proportion of all farm workdays         | %              |
| Farm     | famfamilyonly | Only family members work on the farm                                       | 1 = yes; 0 = no |
TABLE 2  Variables used in the child-level data set. The dependent variable is presented in bold type; variables found to have a significant effect on the probability of a child taking over the family farm are in italics.

| Category | Code | Description | Unit of measure |
|----------|------|-------------|-----------------|
| Child    | Takeover | Child is willing to take over the farm | 1 = yes; 0 = no |
| Child    | chldchos | Child has been chosen as the successor | 1 = yes; 0 = no |
| Child    | chldage | Child’s age | Years |
| Child    | agegap | Age gap between farmer and child | Years |
| Child    | chldgend | Child’s gender | 1 = female; 0 = male |
| Child    | chldschool | Child has at least a high school diploma | 1 = yes; 0 = no |
| Child    | chldschoolagr | Child has a high school diploma in agriculture | 1 = yes; 0 = no |
| Child    | chldlivfarm | Child lives on the farm | 1 = yes; 0 = no |
| Child    | Child PC | Child uses a personal computer | 1 = yes; 0 = no |
| Child    | chldofffarm | Child works off-farm | 1 = yes; 0 = no |
| Child    | Brother/sister | Child has brothers and/or sisters | 1 = yes; 0 = no |
| Farmer   | Farmer children | Number of farmer’s children | Number |
| Farmer   | fmrrage | Farmer’s age | Years |
| Farmer   | fmrgender | Farmer’s gender | 1 = female; 0 = male |
| Farmer   | fmrschool | Farmer has at least a high school diploma | 1 = yes; 0 = no |
| Farmer   | fmrrexp | Farmer’s years of working experience on the farm | Years |
| Farmer   | fmloff | Farmer works off-farm | 1 = yes; 0 = no |
| Farmer   | fmloff% | Farmer’s off-farm workdays as a proportion of all workdays | % |
| Farmer   | Farmer PC | Farmer uses a personal computer | 1 = yes; 0 = no |
| Farm     | Farm children | Number of children on the family farm | Number |
| Farm     | Farm sales variables | Annual amount of farm sales: revenues from selling farm products | Classes |
| Farm     | farmsalesincr | Farm sales have increased over the last 5 years | 1 = yes; 0 = no |
| Farm     | farmhectar | Utilized agricultural area on the farm | Hectares |
| Farm     | farmrent | Proportion of farm’s utilized agricultural area that is rented | % |
| Farm     | farmcosts | Total farm-explicit production costs: costs of purchasing production support not provided by the family farm | US$ |
| Farm     | farmemploy | Workdays of nonfamily members as a proportion of all farm workdays | % |
| Farm     | farmfamilyonly | Only family members work on the farm | 1 = yes; 0 = no |

Table 2 shows variables used in the child-level data set; descriptive statistics are provided in Supplemental data, Table S2 (http://dx.doi.org/10.1659/MRD-JOURNAL-D-14-00107.s1).

Because the dependent variables describing farm succession in the 2 data sets (succession at the farm level and takeover at the child level) are dichotomous, we used...
a limited dependent-variable probit regression model (Wooldridge 2012) to find which factors have
a statistically significant effect on the probability (at the
farm and child level) that succession will take place. Once
we identified those variables via probit regression, we
computed their average marginal effect (AME) in
increasing or decreasing the probability of succession at
both levels. This computation was necessary, because the
first output of probit regression (parameter estimates
associated with each explanatory variable) are not as
easily interpretable as those of linear regression may be.

Results

Variables listed in Tables 1 and 2 were combined to run 2
probit regressions (the first at the farm level and the
second at the individual child level), selecting from each
data set those combinations of variables whose probit
parameter estimates had a statistically significant effect
on intrafamily farm succession or on individual takeover
choice (Supplemental data, Tables S3 and S4; http://dx.doi.
org/10.1659/MRD-JOURNAL-D-14-00107.S1). For such
variables, AMEs were computed. The effect of each
variable was compared, where possible, with findings of
previous similar studies. (Results are not fully
comparable, because different variables were used to
approximate intrafamily farm succession outcomes.)
Table 3 illustrates which factors affect farm succession
and to what extent. In this model, the dependent
variable (succession) reflects farmer expectations
related to future generational turnover in the operation
of the farm.

Only 6 of the explanatory variables listed in Table 1
had a significant effect on farm succession; 2 are related
to child characteristics, 3 are related to farmer attributes,
and 1 is related to a farm business trend. The AMEs
reported in the second column of Table 3 quantify the
change in the probability that farm succession will take
place as a consequence of a change in the explanatory
variable (accounting for the simultaneous effect of other
explanatory variables). If the explanatory variable is
dichotomous, AME reports the change in probability of
succession when it changes from 0 to 1. Considering the
first (dichotomous) variable chldschoolagr, for instance,
based on the present results, a farm family with at least
1 child with a high school education and an agriculture
specialization has, on average, a 26.69% greater
probability of intrafamily succession than does a farm
family without this characteristic (other things being
equal). When the explanatory variable is continuous, the
AME indicates the probability change in farm succession
because of a 1-point increase above its sample mean. In
this case, an AME of 0.00986 associated with the
(continuous) variable frmrexper means that an additional
year of farmer working experience above 23.145 years
(the sample mean) increases the probability of intrafamily
farm succession by 0.9866%. Bearing in mind that in
a probit model the marginal effect of a continuous
covariate is not constant but rather changes as the value
of the variable changes, we were able to calculate the
probability of farm succession at different amounts of
farmer work experience. For example, the estimated
probability of intrafamily succession when the farmer has
30 years of experience is 32.41%, compared to 24.20% at
the sample mean. The third column of Table 3 reports the
P values associated with each AME; these values indicate
the probability that the effect of the explanatory variable
on farm succession is statistically insignificant. We have
therefore listed only those variables with a P value equal
to or smaller than 0.1.

Among child characteristics, the estimated effect on
farm succession of the presence of a child with an
education in agriculture (chldschoolagr), +26.69%, is in
line with Kerbler (2008). When at least 1 child lives on the
farm, succession probability increases by 15.5% (other
things being equal), a result compatible with Simeone
(2005, 2006) even if smaller in magnitude, both when the
farmer has graduated from high school (+84.6%) and
when the farmer’s partner has a high school diploma
(+25%). In our study, farmer attributes that were not

| Explanatory variable | AME on dependent variable | P > z |
|----------------------|---------------------------|-------|
| chldschoolagr        | 0.2669386                 | 0.088 |
| chldlivfarm          | 0.1549754                 | 0.065 |
| frmrgender           | 0.2048748                 | 0.026 |
| frmrschool            | 0.1329061                | 0.108 |
| frmrexper          | 0.0098556                 | 0.004 |
| farmsalesincr        | 0.2526331                 | 0.014 |

*The number of observations is 102.
*The mean value of farmer experience in the sample is 23.145 years.
*Logit regression on the same specification gives, for this variable, a similar marginal effect (0.1382914) with P > z = 0.083.
found to play a significant role in succession were the number of children in the farm family, the farmer’s age (although other studies found it had a positive or nonlinear effect on succession), off-farm employment (which usually depresses farm succession), and the farmer’s information technology skills.

Farms managed by a woman had a 20.49% greater probability of intrafamily succession than those operated by a man. This result is in line with Corsi (2009), but stronger in magnitude, and with Glauben et al (2004), and it is meaningful in terms of insights and policy implications for enhancing farm succession in this context. On farms where the farmer has earned a high school diploma (frmrschool), intrafamily succession probability rises, on average, by 13.29%, a value lower than that found by Simeone (2006) and unlike that reported by Corsi (2009), who found that farmer education would lower by 2.3% the probability of children taking over the farm.

The only farm characteristic that significantly affected farm succession was farm sales (farmsalesincr): Other things being equal, a farm with sales that had increased over the past 5 years had 25.3% more probability of intrafamily succession. Such a variable can be intended as a proxy for farm product marketability and, in general, for farm competitiveness and profitability (no data on farm profits were available). Surprisingly, no other economic or structural variable affected intrafamily farm succession, although earlier studies found that it increases with farm size (Kerbler 2008). Neither the proportion of farmland that was rented nor the proportion of farm labor carried out by family members affected succession.

For the child-level data set, Table 4 reports the estimated effect of variables (as listed in Table 2) that significantly affect the willingness of a child to take over the family farm. While the dependent variable in the farm model reflects farmer expectations on farm succession, in this case the binary outcome and the subsequent analysis focused on what influences an individual child’s choice to take over the family farm. Surprisingly, none of the farm characteristics affected the probability that a child would take over the farm, not even farmsalesincr, which did affect intrafamily succession at the farm level. This lack of effect may be explained by statistical independence between farm features and takeover outcome, whose variability is better explained by child and farmer characteristics. The only farm characteristic that influenced individual takeover choice was the number of children in the farm family; the more competition among siblings on the farm to become a successor, the less willingness among them to continue. On average, female children (chldgend) were 19.6% less willing to take over the farm than their male counterparts, a finding in line with, but half the magnitude of, that of Simeone (2005, 2006). While specialized education in agriculture was not significant, having a high school diploma (chldschool) lowered by 9.8% the likelihood of a child’s taking over the farm. This is in line with Simeone (2005, 2006), who found an inverse relationship between education level and willingness to take over the farm, because the former would increase the opportunity cost of continuing agricultural activity. In our specific case, where part-time farms are predominant, it is not surprising that higher education levels tend to push children to full-time off-farm employment. This explanation would be confirmed by the insignificant effect of child off-farm employment (chldoffarm), which is already accounted for by the education variable.

Farmer characteristics affecting individual choice to take over the family business were the same as those influencing the likelihood of farm succession, with the exception of farmer gender (frmrgender), which was not statistically significant at the child level. A high school-educated farmer (frmrschool) raises children’s willingness to take over the farm by 14.6%, compared to a farmer without such education attainment; this effect is in line with those of the farm succession model (+13.3%). Child intention to continue the family farm activity rises by 0.821% for an additional year of farmer working experience (frmrexper) above the sample mean (24.06);

| Explanatory variable | AME on dependent variable | P > z |
|----------------------|---------------------------|------|
| Farm children        | -0.0582880                | 0.047|
| chldgend             | -0.1959806                | 0.000|
| chldschool           | -0.0978308                | 0.072|
| frmrschool           | 0.1464946                 | 0.002|
| frmrexper            | 0.0082117                 | 0.000|

* The number of observations is 193.
* The mean value of farm children in the sample is 2.3367.
* The mean value of farmer experience in the sample is 24.066 years.
this characteristic also affects in the same direction both child takeover choice and farm succession probability, more so in the latter case (+0.985%).

Discussion and conclusions

This study analyzed intrafamily farm succession in a sample of mountain apple farms, measuring its extent and trying to identify its main drivers both at the farm level and from the viewpoint of the child and potential heir. This evidence may improve understanding of this system and point to some key policy implications.

The farm succession rate in our data set is very low (26.5%), which raises many concerns about the future of apple production in Valtellina. Losing such an important asset may cause problems from both an economic and an environmental perspective, with consequent risk of land abandonment on steep slopes and landscape degradation.

The characteristics of the farm do not seem to play a role in succession, with one exception: Intrafamily succession was 25% more likely when sales had increased over the previous years. As previously mentioned, given the structure of the data set, such a variable can be considered a proxy of farm product marketability and of farm competitiveness and profitability. Individual and collective strategies aimed at increasing the marketability of farm products, such as cooperatives and producer associations, should thus be implemented, or improved where they already exist. Likewise, all factors fostering farm competitiveness and profitability will indirectly foster intrafamily farm succession.

Results on the effect of farmers’ and children’s education are mixed, but taken together, they point to a positive effect on succession and takeover choice. High school education lessens by 9.8% the likelihood of a child taking over the farm, while this choice is increased by 14.6% when the farmer holds a diploma. Farmer and child education thus have opposite effects on individual takeover decisions, but the former is stronger than the latter. Farmer education has almost the same effect and magnitude both on child’s choice to continue and on farm succession probability (+13.2%); furthermore, intrafamily farm succession is 26.7% more likely when at least 1 child has specialized education in agriculture. Higher education attainment (particularly in agriculture) should thus be encouraged in consideration of its beneficial effects on farm succession, even if it can increase to some extent off-farm migration.

Gender effect on succession also seems to be contradictory; being a female diminishes by 19.6% individual willingness to take over the farm, but when a woman becomes a farmer this event increases intrafamily farm succession likelihood by 20.5%. The latter effect may be because of widows taking over farm operation at their husband’s death and then passing on the farm to the next generation. This interpretation may be plausible in general, but it does not fit our sample, which showed that in family farms where succession takes place, female farmers are, on average, younger than their male counterparts. Women thus play a key role in keeping agriculture alive in mountain areas, and policies should be developed to recognize and reward this. Farmer working experience exerts almost the same effect on the probability of both farm succession and individual takeover choice (+0.99% and +0.82%, respectively, for an additional year of experience above the sample mean).

To summarize, our findings—while mixed—suggest that women play a key role in keeping family farming alive in mountain areas, along with education of family members and improved marketability of agricultural products. Our results also describe the dynamics within the population of family farms from which the sample used for this analysis was drawn (farms specializing in apple production in Valtellina, an Alpine valley in Sondrio Province), but they may indicate actions to be taken to keep alive such activity in mountain areas in general, which is endangered by a low succession rate.

To foster intrafamily farm succession, 2 types of solutions are feasible:

- On the market side, a renewed effort should be undertaken to valorize the Valtellina apple brand, which is less well known than that of Trentino, a formidable nearby competitor. This can be achieved by strengthening existing cooperatives and producers’ associations through promotion of management that meets modern business criteria.
- On the policy side, current agricultural policies do not adequately support mountain farms with specialties such as fruit, viticulture, berries, and minor crops, which are usually small and managed part time. European Union Common Agricultural Policy payments and Less Favored Areas Compensatory Allowances (each a few hundred euro per hectare per year) are calculated based on utilized agricultural area and consequently provide little support for small farms. However, the Rural Development Program seems to be better suited for supporting both family farming in mountains and intrafamily turnover for a variety of reasons. First, it provides measures to specifically support young farmers who take over the family farm and to improve human capital in agriculture. Second, it provides measures that indirectly foster intrafamily farm succession by supporting investments and improving farm competitiveness. In view of our results, the latter measures could be preferably oriented toward young and female mountain farmers.

Further research is needed to deepen the knowledge of farm succession dynamics in the Alpine area, enlarging the examination and making comparisons with other farms—including farms in the same valley with different specializations (eg livestock and wine) and similar (apple-
producing) farms in other mountain areas in Italy, like the Trentino region. Cross-regional comparison would make it possible to control for variables that are (almost) invariant in the present study area but that significantly affect off-farm labor migration, like the income difference between the agricultural and the nonagricultural sectors (Olper et al. 2014) and the employment rate (Corsi 2009).

ACKNOWLEDGMENTS

The authors thank the two anonymous reviewers and the associate editor for their helpful comments and suggestions that substantially improved the paper. The present work would not have been possible without data gathered during the research project “AOP UNOLOMBARDIA: Il primario avanzato—Progetto per lo sviluppo di una struttura a rete che assista la ‘coopetizione’ tra le filiere ortofruttiliche aderenti ad AOP UNOLOMBARDIA” undertaken by the Rural Development Program of the Lombardy Region, 2007–2013.

REFERENCES

Aldanondo Ochoa AM, Casanovas Oliva V, Almansa Saenz C. 2007. Explaining farm succession: The impact of farm location and off-farm employment opportunities. Spanish Journal of Agricultural Research 5(2):214–225.

Calus M, Van Hoylenbreecq G, Van Lierde D. 2008. The relationship between farm succession and farm assets on Belgian farms. Sociologia Rurais 48(1):38–56.

Casillo F, Casillo MR, Venittelli T, Zazzaro A. 2013. Aging and succession on Italian farms. Politica Agricola Internazionale—International Agricultural Policy 2013(1):39–55.

Corsi A. 2008. Family farm succession and specific knowledge in Italy. Rivista di Economia Agraria 64(1):12–30.

Dax T. 2001. Endogenous development in Austria’s mountain regions. Mountain Research and Development 21(3):231–235.

Dumas C, Dupuis JP, Richer F, St-Cyr L. 1995. Factors that influence the next generation’s decision to take over the family farm. Family Business Review 8(2):99–120.

Frisio DG, Ferrazzi G, Tesser F. 2012a. Coopetizione: A strategic model for horticultural sector? The case of Lombardy region. Acta Horticulturae 960:247–254.

Frisio DG, Ferrazzi G, Tesser F. 2012b. La coopetizione: Un modello strategico per le imprese agroalimentari? Il caso del comparto ortofrutticolo lombardo. Economia Agro-alimentare 1:295–317.

Glauben T, Petrick M, Tietje H, Weiss CR. 2009. Probability and timing of succession or closure in family firms: A switching regression analysis of farm households in Germany. Applied Economics 41(1):45–54.

Glauben T, Tietje H, Weiss CR. 2004. Intergenerational succession in farm households: Evidence from Upper Austria. Review of Economics of the Household 2:443–461.

Inwood SM, Sharp JS. 2012. Farm persistence and adaptation at the rural–urban interface: Succession and farm adjustment. Journal of Rural Studies 28(1):107–117.

Keating NC, Little HM. 1997. Choosing the successor in New Zealand family farms. Family Business Review 10(2):157–171.

Kerbler B. 2008. The influence of factors of the socio-geographical structure of mountain farms in Slovenia upon farm succession statuses and decisions. Acta Geographica Slovenica 48(2):278–292.

Kerbler B. 2009. The effect of factors of the socio-geographic structure of mountain farms on succession on these farms. Revista de Geografía—Journal for Geography 4(2):47–60.

Kerbler B. 2012. Factors affecting farm succession: The case of Slovenia. Agricultural Economics (Czech) 58(6):285–298.

Kimhi A. 1994. Optimal timing of farm transfer from parent to child. American Journal of Agricultural Economics 76(2):228–236.

Kimhi A, Nachlieli N. 2001. Intergenerational succession on Israeli family farms. Journal of Agricultural Economics 52(2):42–58.

Lobley M, Baker JR, Whitehead I. 2012. Keeping it in the Family: International Perspectives on Succession and Retirement on Family Farms. London, United Kingdom: Ashgate.

Lucas RE Jr. 2004. Life earnings and rural–urban migration. Journal of Political Economy 112(1):29–59.

MacDonald D, Crabtree JR, Wiesinger G, Dax T, Stamou N, Fleury P, Gutierrez Laugizta J, Gibson A. 2003. Agricultural abandonment in mountain areas of Europe: Environmental consequences and policy response. Journal of Environmental Management 59(1):47–69.

Mann S. 2007a. Tracing the process of becoming a farm successor on Swiss family farms. Agriculture and Human Values 24:435–443.

Mann S. 2007b. Understanding farm succession by the objective hermeneutics method. Sociologia Rurals 47(4):369–383.

Mann S, Mittenzwei K, Hasselmann F. 2013. The importance of succession on business growth: A case study of family farms in Switzerland and Norway. Yearbook of Socioeconomics in Agriculture—Agrarwirtschaft und Agrarsozioologie—Économie et Sociologie Rurales 6(1):109–137.

Misra AK, El-Osta HS. 2008. Effects of agricultural policy on succession decisions of farm households. Review of Economics of the Household 6:285–307.

Misra AK, El-Osta HS, Shalik S. 2010. Succession decisions in U.S. family farm businesses. Journal of Agricultural and Resource Economics 35(1):133–152.

Mundlak Y. 1979. Intersectoral Factor Mobility and Agricultural Growth. Washington, DC: International Food Policy Research Institute.

Olper A, Raimondi V, Cavicchioli D, Vigani M. 2014. Do CAP payments reduce farm labour migration? A panel data analysis across EU regions. European Review of Agricultural Economics 41(5):843–873.

Otomo Y, Oedi-Wieser T. 2009. Comparative analysis of patterns in farm succession in Austria and Japan from a gender perspective. Jahrbuch der Österreichischen Gesellschaft für Agrarökonomie 18(2):79–92.

Simeone M. 2005. The generational turnover in agriculture: Theoretical problems and empirical evidences. Unpublished paper prepared for presentation at the 94th Seminar of the European Association of Agricultural Economists. Ashford, United Kingdom, 9–10 April. Available from the corresponding author of this article.

Simeone M. 2006. Le determinanti del trasferimento intergenerazionale in agricoltura: Un’analisi empirica basata sulla stima di un modello probit. Rivista di Economia Agraria 64(1):519–539.

Stiglauer A, Weiss CR. 2000. Family and non-family succession in the Upper Austria farm sector. Cahiers d’Économie et Sociologie Rurales 54:3–26.

Todaro MP. 1969. A model of labor migration and urban unemployment in less developed countries. American Economic Review 59:138–148.

Wooldridge JM. 2012. Introductory Econometrics: A Modern Approach. 5th edition, IMason, OH: South-Western Cengage Learning.