Farm succession at a crossroads: the interaction among farm characteristics, labour market conditions, and gender and birth order effects

Abstract

Farm succession is a relevant issue, as it is related to rural and youth migration, sustainability and the ageing of the agricultural sector. Understanding the factors behind the willingness of potential successors to take over the family business is crucial for farm continuity. We examine the factors affecting children’s likelihood of carrying on the family business in a sample of 216 potential heirs of Italian horticultural farms. Using local labour market conditions (income gap and employment rate) and surrounding context variables (population density), we plug the farm labour migration/occupational choice theory into farm succession analysis. This approach allows us to treat child succession as the opposite of the choice to migrate out of the farm sector. While farm labour migration theory predicts linear negative effects of labour market/contextual variables on farm transfer, we find that the income gap, employment rates and population density exert both negative and positive effects on child succession, according to their intensity. The pro-succession effects we find suggest that, despite potential threats, the proximity to wealthy areas may represent an opportunity for farm continuity and thriving. We also examine explicitly the effect of child characteristics (gender and birth order), finding that male and first-born potential successors are more likely to take over the family farm, in accordance with results from previous firm succession studies. This finding suggests a persistence of traditional normative beliefs in the agricultural sector.

Keywords
Highlights

Farm succession (FS) pertains to youth migration, sustainability and agricultural ageing

Heirs’ features and local labour market/-neighbouring conditions affect FS

FS is more likely among first-born and male children as a result of normative beliefs

We treat FS as the opposite of rural and agricultural labour migration

FS is favoured or depressed by neighbouring conditions, according to their intensity

1. Introduction

It is well known that the structure of agricultural enterprises is family-based in the majority of countries around the world. According to Graeub et al. (2016), 98% of all farms are family-based and concentrate 53% of total agricultural land. In addition, also in those areas with the lowest share of family farms (e.g., South America) they represent the 82% of the total number of farms. In developed countries, the share of family farms ranges from 97% of the European Union (28 countries) to 63% of Australia (Bertoni and Cavicchioli, 2016a). Given the
prominent importance of family farming, it is evident that the perpetuation of agricultural activity is mainly based on intra-family farm succession (Leonard et al., 2017; Chiswell, 2016; Lobley et al., 2010). However such a view is challenged by some authors, that points on the increasing role of new entrants in ensuring farming continuity (Joosse and Grubbström, 2017).

One of the necessary conditions for this transfer is the willingness of potential successors to take over the farm business. However, there are many studies witnessing the intention of young potential heirs to abandon agricultural activity and/or rural areas (Morais et al., 2017b; Bednaríková et al., 2016; Demartini et al., 2015; Chen et al., 2014; Bjarnason and Thorlindsson, 2006). This trend seems to be stronger for young women (Leibert, 2016; Johansson, 2016), also as a consequence of the persistence of patrilineal culture in farming activities (Price, 2012; Heggem, 2014). Even if rural and agricultural migration phenomena do not overlap perfectly, they are undoubtedly connected, and choices and trajectories of individuals and family farms are part of these patterns. A counterpart and consequence of youth migration from agriculture and rural areas is the ageing of the population of farmers (Duesberg et al., 2017; Leonard et al., 2017; Bertoni and Cavicchioli, 2016a). Such a claim is supported by data (European Commission, 2012): in 2007, the ratio between young and old farmers was 1 to 9 in the EU-27, even if these figures are quite scattered and differentiated in each country (Zagata and Sutherland, 2015).

As the adoption of more sustainable and innovative farming practices is inversely correlated with farm age, farm ageing induced by younger farmers’ migration may lead to a lower uptake of environmentally friendly farming practices (Leonard et al., 2017; Gaviglio et al., 2016; Suess-Reyes and Fuetsch, 2016; Paracchini et al., 2015; Zagata and Sutherland, 2015; Bertoni et al., 2011; Van Passel et al., 2007). It is thus clear the relevance of farm succession
in slowing down youth migration from rural areas, counteracting the ageing of the farmers population and promoting sustainability and innovation in the agricultural sector.

For the abovementioned reasons, it is relevant to analyse to what extent such transfer takes place and the most relevant features that affect the probability of transfer. However, it is worth noting that—so far—farm succession has been often analysed mainly in isolation with respect to the wider phenomenon of agricultural and farm labour migration. Therefore, it is important to highlight how external factors (such as local labour market and surrounding territorial conditions) may interact with such a process.

Gender and primogeniture issues in farm succession have been widely explored from a qualitative viewpoint (Chiswell, 2016; Fischer and Burton, 2014; Gasson et al., 1988; Whatmore et al., 1987). However, the role of child gender, and especially birth order, has been less frequently considered in the analysis of farm succession determinants using quantitative methods (probit and logit regression), while such a topic has been examined in the management/business literature on family firms’ succession.

In this context, our paper is at a crossroads with different strands of literature. We merge traditional literature on farm succession determinants (mainly at the farm level) with the occupational choice theory—OCT, hereafter (Mundlak, 1978)—considering the intention of potential heirs to take over the family business as a complement to searching for employment outside of the agricultural sector (Bertoni and Cavicchioli, 2016b; Olper et al, 2014). In doing so, we make explicit the role played by the local labour market, the farm location and the territorial features surrounding the farm in the intention of potential heirs to take over the farm rather than to search for a non-farm job. As a further contribution to the existing literature, we make explicit the effect of the birth order and the gender of potential successors in the choice of taking over the family business (Ahrens et al., 2015; Sharma and Irving,
2005; Chrisman et al., 1998). We analyse such effects and interactions in a sample of Italian horticultural farms using logistic regression and looking for nonlinear effects.

The reminder of the paper is structured as follows: Section 2 presents the three pieces of literature (traditional farms succession determinants; occupational choice theory (OCT); birth-order and gender effect in management/business) on which the paper is based; Section 3 illustrates the data, the variables and the applied methodology; Section 4 reports the main results, which are discussed in Section 5; and Section 6 concludes.

2. Family farm succession analysis, the occupational choice, birth order and gender: a brief review

Recently, there has been a growing field of literature focusing on various aspects related to intra-family farm succession: the intra-family dynamics underlining the succession process (Falkiner et al., 2017; Fischer and Burton, 2014), the intention and/or reluctance of elder farmers to retire (Conway et al., 2017; Conway et al., 2016), the identity and intention of potential farm successors to take over the family business (Morais et al., 2017a; Morais et al., 2017b), the potential post-succession farm strategies (Ohe, 2017; Suess-Reyes and Fuetsch, 2016), and public policies affecting succession (Corsi, 2017, Mishra and El-Osta, 2008).

Within such a broad topic, there is a long-established tradition of analysing the determinants of intra-family farm succession using an empirical approach, mainly at the farm level (Dudek, 2016; Corsi, 2009; Kerbler, 2008; Mishra and El-Osta, 2008; Glauben et al., 2004; Kimhi and Nachlieli, 2001; Stiglbauer and Weiss, 2000).

However, the availability or the intention of each child to succeed the family farm has been rarely investigated (Cavicchioli et al., 2015; Aldanondo Ochoa et al., 2007; Mann, 2007;
Simeone, 2006). Using child-level data allows for the measurement of the effect of potential successors’ characteristics on the probability of intra-family transfer. These features provide additional information, along with farm and farmers’ characteristics. In greater detail, Mann (2007) tested the effect of individual and environmental factors on the potential heirs’ willingness to take over the family farm in a sample of 454 male and female children in Switzerland. Male children’s willingness was higher among those having at least a high school diploma and an increasing number of sons, while it was reduced by the amount of land owned. In line with previous farm-level analysis, Simeone (2006) found a negative relationship between child gender (female) and her probability to take over the family farm. In the same study, based on a sample of 225 farm children, farm holder education level (graduation), work intensity (full-time), and the share of rented land increased the probability of succession. In a sample of 195 children from 76 Spanish households, Aldanondo Ochoa et al. (2007) tested the determinants affecting child involvement in the farm (working full-time, part-time or not working) using an ordered logit model. They found that child education, the number of children in the household, farm acreage and the distance between the farm and the closest city discourage against the decision to work on the farm. They also found a nonlinear U-shaped relationship between child age and on-farm employment. Finally, Cavicchioli et al. (2015) examined which elements increase the probability of a child taking over the farm in a sample of 193 apple farm children in a northern Italian mountain region. Consistent with the findings of other authors, a lower succession probability (-19%) was found for female children. A negative effect was also noted based on the number of children on the farm (-5.8% for any additional child) and by children’s education (high school diploma). On the other hand, farmer education (at least high school) increased the willingness of heirs to take over the farm by 14.6%.
Even if the likelihood of intra-family succession is influenced by internal factors linked to the farm and family members’ features, an important role may also be played by the territorial and socio-economic context in which each farm operates. Particularly, two contextual factors are worthwhile to investigate in relation to the farm succession: the rural-urban relationships and the surrounding labour market conditions. Both of these factors may provide incentives or disincentives to keep working in the farming sector (generally in the family farms) or to migrate out of it. These incentives depend on the probability of finding an alternative non-farm employment, a higher income, and, more generally, a better quality of life in urban areas.

The relationship between farm succession and surrounding territorial socio-economic conditions has not been deeply investigated, with some exceptions. Aldanondo Ochoa et al. (2007) found an inverse relationship between the distance from the closest urban centre and the succession probability. In a farm-level analysis, Corsi (2009) found a direct effect of the relative labour size of the local agricultural sector on in-farm child employment and an opposite effect of the regional employment rate. In general, using variables describing local labour market conditions allows for the examination of intra-family farm transfer as a complemental phenomenon with respect to out-farm labour migration. In fact, farm succession may be considered a result of occupational choice made by potential heirs. Following OCT (Larson and Mundlak, 1997; Barkley, 1990; Mundlak, 1978; Todaro, 1969), the decision of farm household members to keep working in the agricultural sector depends on their expectations to maximize personal welfare. The key factors considered to make this choice are the income differential between the agricultural and non-agricultural sectors and the probability of finding a job in the non-farm sector. This probability depends, in turn, on the unemployment rate and the relative size of the non-agricultural sector (often approximated by the population density). Applying OCT, Olper et al. (2014) found that out-farm labour
migration depends on the variables related to labour market conditions (share of agriculture in the total labour force, unemployment rate), the income gap between agriculture and other sectors and the population density. Alasia et al. (2009) found similar results, testing the role of the same factors (except for income gap) in modelling off-farm labour choice in Canada. Following these authors, we chose to test such factors in our analysis on farm children succession.

In the current literature on farm succession, the role of birth order of potential heirs has not been yet explored. On the other hand, this aspect is analysed in many studies on firm performance and succession in the business and management domain.

Stavrou (1998) individuates four categories of factors influencing the decision process behind the involvement of a child in her/his family firm: family, business, personal, and market factors. Among family factors, which describe the interactions/relationships/dynamics among family firm members, birth order assumes a prominent role in the decision process of succession. Generally, first-order children tend to be more favoured in succession. There are several explanations for this finding. Goldberg and Wooldridge (1993) report that first-born children are more likely adopt their parents' beliefs and wishes, tending to identify themselves with the previous generation’s behaviour. However, this issue is also strictly linked with family and social values and beliefs. In fact, as primogeniture remains again a distinctive feature of many cultures in spite of meritocracy, the decision to pass control of the firm to the first child may also be influenced by normative social concerns (Brockhaus, 2004; Chrisman et al., 1998). Sharma and Irving (2005) propose four bases of successor commitment, namely, the affective (based on personal desires), the normative (based on a perceived sense of obligation), the calculative (based on perceived opportunity costs) and finally, the imperative (based on perceived firm needs). Particularly, the relations between gender, birth order and succession pertain to normative commitments, as it can be seen as a sort of obligation of the
male heirs towards the family firm to prosecute the family business. This obligation can be
grounded in familial norms related to the birth order of potential heirs, but in many cases,
primogeniture could be socially institutionalized, being a popular practice that is difficult to
overcome (Sharma and Rao, 2000). Furthermore, primogeniture may be strictly linked with
norms related to the heir’s gender. In a survey of Danish firms, Bennedsen et al. (2007)
reports that primogeniture is often practised in relation to a male-line succession. Falkiner et
al. (2017) reach a similar conclusion after interviewing a sample of Australian family firms.

One of the main contributions that highlights the role of birth order of potential successors is
given by Schenkel et al. (2016), who examines the relationship between the choice of
successor and performance in a sample of Korean family firms. In their study, Schenkel et al.
(2016) find that the attribution of managing responsibilities to successors in family firms is
directly linked with the birth order of potential heirs, clearly favouring the first child at the
expense of the next ones. This phenomenon is explained by the long-term reciprocity between
the first-born potential heir and her/his parents, increasing the likelihood of the internalization
of their values and the persistence of cultural norms related to primogeniture. The higher
propensity of the first son with respect to other successors to adopt well-established family
values and business vision may translate into a conservative and non-innovative behaviour of
the young firm manager. In many cases, as detected by the same authors, this practice has a
negative influence on firm performance, such that the first-child successor is more likely to be
subsequently replaced in leading the firm than in situations in which the management of the
firm is inherited by other siblings. Authors ascribe this result to a greater openness of non-
first-child successors towards non-familial governance resources and external meritocracy.

Finally, in reviewing the past literature on succession in family firms, Nordqvist et al. (2013)
suggest focussing on the birth order of descendants, as it is a relatively unexplored topic.
Given the abovementioned background literatures, the contribution of the present paper is threefold: i) we nest OCT in farm succession analysis, making explicit the role of local labour markets and surrounding conditions in the propensity of potential heirs in carrying out the family business, and in doing so, we build upon and extend previous contributions, such as those of Corsi (2009) and Olper et al. (2014); ii) following the management and business firm succession literature, we test the role of gender and birth order on the willingness to take over the family farm; iii) we test to what extent gender, birth order effect and local labour market conditions interact and play a role in the probability of potential successors to continue in the family business.

### 3. Data and variables

We analyse the willingness of children to take over the family farm in its main determinants using survey data collected in 2010 among 362 farms associated with the most important consortium of horticultural producer organizations (POs) in Italy (AOP UNOLOMBARDIA). This sample covered approximately 95% of farms belonging to that consortium, and they were located in 5 Italian regions (Lombardy, Piedmont, Veneto, Emilia-Romagna and Campania). Considering this area of interest, our sample represents 8% of farms specialized in horticulture. Among these farms, 41.5% were specialized in ready-prepared fresh vegetables (RPFV), while the others were dedicated to fresh, frozen or semi-processed vegetables. The RPFV sector is regarded as excellent in the Italian horticulture landscape, with different features with respect to other horticultural farms. As RPFV incorporate a large amount of services and value added, they need large investments and a continuous propensity towards innovation to be produced. Consequently, a strict integration among farms and processors/retailers along the supply chain has interested the RPFV sector, along with a
clusterization of farms into specific POs, whose main task is to meet higher quality standards required by retailers and to improve coordination within the supply chain. According to specific analyses (Casati and Baldi, 2011), RPFV farms were located mainly in two regions (Lombardy and Campania) and consisted of approximately 700 specialized farms in 2010. Thus, our sample represents 21.5% of RPFV farms. In this sense, our sample is not random and overrepresents RPFV farms.

Starting from a sample of 362 horticultural farms, we used a sub-sample of 147 farms, in which the age of the farm manager was at least 50 years and there was at least one child aged 15 years old or over. There were 267 children aged at least 15 years, who represented the object of our analysis. Due to a lack of data for some variables, the number of children fell to 216, belonging to 118 farms.

The survey was not conceived to investigate the farm succession issue; rather, it was created for self-informative purposes of AOP UNOLOMBARDIA¹. However, it provides useful information about children’s willingness to prosecute their family business, along with factors that are potentially influential in farm succession according to the literature (Bertoni and Cavicchioli, 2016a). From survey data, we extracted a set of information on children, farm holders and farm characteristics. All variables were coded at the child level, representing the statistical unit of our analysis. We integrated such data with specific variables representing the surrounding labour market and demographic conditions. These last variables were calculated at the Local Labour System level. The Local Labour System is an Italian statistical territorial unit, as defined by ISTAT (Italian Institute of Statistics), corresponding to a group of municipalities having homogeneous features in terms of labour market conditions.

¹ For further details and analysis on both AOP UNOLOMBARDIA and on the self-informative analysis see Frisio et al. (2012)
Different strategies may be adopted to assess whether intra-family succession takes place (Bertoni and Cavicchioli, 2016a, b). In fact, farm succession is directly observable only following the behaviour of the same farms over time, for example, through different series of agricultural census data (Stiglbauer and Weiss, 2000; Kimhi, 1994). A second-best alternative is to assume that a farmer’s children currently working in the farm will take it over (Corsi, 2009; Aldanondo Ochoa *et al.*, 2007; Kimhi and Nachlieli, 2001). Another alternative is to collect information on the expectations of the farm holder and/or potential heirs about the farm succession process (Cavicchioli *et al.*, 2015; Kerbler, 2008; Aldanondo Ochoa *et al.*, 2007; Mann, 2007; Simeone, 2006; Kimhi and Nachlieli, 2001).

Given the cross-sectional nature of our survey, we chose the last option. As mentioned above, we took advantage of a survey not specifically designed for farm succession analysis but that nonetheless registered information on this topic. In particular, all the information on human capital, family labour and orientation to farm succession have been provided by a single interviewed person for each farm, usually the farm holder. This subject has been asked about the orientation to take over the farm for each child in the family. We are aware that this statement represents only a proxy of farm succession and that the expectations of the farm holder and/or children do not always turn in farm succession, as reported by Väre *et al.* (2010). However, according to other authors (Lobley *et al.*, 2010; Errington, 1998), the succession process takes place in a progressive fashion (*succession ladder*); this process may reduce the bias of using self-declared intention of potential heirs as a proxy of their future actual choice. In the sample of 216 children, 89 of them were declared to be willing to continue parental activity on the farm, with a child succession rate of 41.2%.

The list of variables used is reported in Table 1, while Table 2 provides descriptive statistics.
For each variable, previous studies using the same or similar variables and their estimated
effects on farm succession are reported. For contributions for which the dependent variable
was out-farm migration, the effects have been normalized with respect to farm succession.

Table 1 – Data and variables

<table>
<thead>
<tr>
<th>Category</th>
<th>Variable</th>
<th>Definition</th>
<th>Unit of measurement</th>
<th>Previous studies using similar variables and their effect (+/-) on succession</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent variable</td>
<td>Succession</td>
<td>Child is oriented to take over the farm</td>
<td>1=yes; 0=no</td>
<td>Simeone (2006) (-); Cavicchioli et al. (2015) (-)</td>
</tr>
<tr>
<td>Child</td>
<td>Child gender</td>
<td>Gender of the child</td>
<td>1= female; 0=male</td>
<td>Aldanondo Ochoa et al. (2007) (US)</td>
</tr>
<tr>
<td>Child</td>
<td>Child age</td>
<td>The age of the child</td>
<td>Years</td>
<td>Stavrou (1998) (-); Schenkel et al. (2016) (-)</td>
</tr>
<tr>
<td>Child</td>
<td>Child order</td>
<td>The child order among farm holder children</td>
<td>1=the child is the first child of the farm holder; 2=the child is the second child of the farm holder; etc.</td>
<td>Aldanondo Ochoa et al. (2007) (US)</td>
</tr>
<tr>
<td>Farm and farmer</td>
<td>Farmer degree</td>
<td>Farmer has a degree</td>
<td>1=yes; 0=no</td>
<td>Simeone (2006) (+) Bertoni and Cavicchioli (2016b) (-)</td>
</tr>
<tr>
<td>Farm and farmer</td>
<td>Farm children</td>
<td>The number of children aged at least 15 years in the farm</td>
<td>Number of children</td>
<td>Aldanondo Ochoa et al. (2007) (-); Cavicchioli et al. (2015) (-); Mann (2007) (+)</td>
</tr>
<tr>
<td>Farm and farmer</td>
<td>Farmland</td>
<td>The area of the farm</td>
<td>Number of hectares</td>
<td>Aldanondo Ochoa et al. (2007) (+); Glauben et al. (2004) (+); Kihmi and Nachlieli (2001) (-)</td>
</tr>
<tr>
<td>Farm and farmer</td>
<td>Farm duration</td>
<td>Years since the farm foundation</td>
<td>Years</td>
<td>Bertoni and Cavicchioli (2016b) (+)</td>
</tr>
<tr>
<td>Farm and farmer</td>
<td>RPFV farm</td>
<td>The horticultural farm belongs to the ready prepared fresh vegetables (RPFV) branch</td>
<td>1=yes; 0=no</td>
<td>Kihmi and Nachlieli (2001) (-); Bertoni and Cavicchioli (2016b) (+)</td>
</tr>
<tr>
<td>Farm and farmer</td>
<td>Turnover_250</td>
<td>The farm annual turnover is over 250,000 EUR</td>
<td>1=the farm annual turnover is over 250,000 EUR; 0=otherwise</td>
<td>Corsi (2009) (+); Mishra and El-Osta (2008) (+); Aldanondo Ochoa et al. (2007) (+); Kerbler (2008) (+)</td>
</tr>
<tr>
<td>Farm and farmer</td>
<td>Growth</td>
<td>The farm annual turnover is growing over that of 2005</td>
<td>1= the farm annual turnover is growing over that of 2005; 0=otherwise</td>
<td>Mishra and El-Osta (2008) (+)</td>
</tr>
<tr>
<td>Farm and farmer</td>
<td>Distance</td>
<td>Distance from the headquarter of the producer organization</td>
<td>km</td>
<td>Aldanondo Ochoa et al. (2007) (-)</td>
</tr>
</tbody>
</table>
Among children’s characteristics, we consider gender, age and birth order of each potential heir. Farm and farmer characteristics include variables related to the physical and economic dimension of the farm—represented by farmland and turnover_250, respectively—and its duration (farm duration). We also tested variables related to the share of hired land and labour (rented_land and emplwork) and farm efficiency, directly measured by the variables farm_costs/worker and growth and, more indirectly, measured by the variable distance. As
additional variables, we consider the education level of the farm holder and whether a farm is RPFV.

Among surrounding characteristics and labour markets features, we include in the model variables previously used in papers on employment choice between the non-farm and farm sectors (Olper et al., 2014). In particular, we test the hypothesis that a wider income differential (\textit{incgap}) between the agricultural and non-agricultural sectors increases the opportunity cost to remain in the farming sector, thus reducing farm transfer probability. As the probability of finding non-agricultural employment is also influenced by the relative size of the sector, we added a variable representing the share of agriculture on total employment (\textit{agrshare}). Theoretically, the bigger the share of the agricultural workforce in the examined area, the lower the probability should be of finding a job in other economic sectors. The same effect can be exerted by the employment rate (\textit{empl}), which should increase the probability of finding an alternative job outside the family farm. Finally, an increasing population density (\textit{popdens}) would reduce the transaction cost of finding an alternative job in the surrounding area, thus increasing the probability of succession. The last variable also approximates the degree of urbanization in the area around the farm, allowing for the examination of the effect of rural-urban linkages on children’s succession. Therefore, the inclusion of population density allows for the connection of occupational choice, farm succession, and farm adaptation to the rural-urban interface (Inwood and Sharp, 2012; Zasada, 2011; Zasada et al., 2011).

\begin{table}[h]
\centering
\caption{Descriptive statistics of variables used in the analysis of farm succession}
\begin{tabular}{lccc}
\hline
\textbf{Variable} & \textbf{Total children (cases=216)} & \textbf{Children without succession (cases=127)} & \textbf{Children with succession (cases=89)} \\
\hline
\end{tabular}
\end{table}
### 4. Methodology

The declared intention of each potential heir in the family farms to take over the business represents our dependent variable, which is dichotomous (1=yes, 0=no). The shortcomings of and justifications for using such variable are presented in Section 3. Given the binary nature of our dependent variable, we use logit regression to estimate whether and to what extent some variables of interest (birth order, farm/farmer characteristics and labour market conditions) affect the likelihood of potential successors to continue farming (Scott Long and Freese, 2014).
The estimated effects of such relevant factors are computed, accounting simultaneously for the influence exerted by other covariates on the intention of taking over the family farm (ceteris paribus). The estimated effects (sign and magnitude) and their statistical significance on the willingness to continue farming are reported in the second and third columns of Table 3. The meaning of logit estimated parameters is not straightforward. For this reason, in Table 3, along with this information, we report two additional effects of the covariates on farm succession probability: the marginal effect at the means (MEM) and a semi-elasticity.

The MEM measures the probability change that a potential successor continues the family activity, as a consequence of a 1-unit change in the independent variable for which it is computed. When that variable is continuous/discrete, this change in probability is computed starting from the mean value of the variable of interest and keeping all the other covariates at their mean values, while when the explanatory variable is dichotomous, the MEM expresses the effect on probability caused by a change in the state of the variable (e.g., from male to female potential successors), with all other covariates at their mean values.

Obviously, a change in the status of a dichotomous variable is far stronger than a 1-unit change in a continuous variable. For this reason, the change in probability caused by a 1-unit change in a continuous variable (e.g., farmland, distance, emplwork) is not comparable with that caused by a change in the status in a dichotomous or a strongly discrete variable (e.g., child_gender, farmer_degree, child_order).

To assure comparability among the effects of different variables, we provide an additional indicator of probability effect: the semi-elasticity, measured as the probability change for a 1% increase in continuous and slightly discrete variables (last column of Table 3). This indicator makes the effects of continuous and slightly discrete variables comparable both in terms of unit of measurement and in terms of magnitude.
According to the aforementioned OCT and its recent applications to European agriculture (Olper et al., 2014), local labour markets and surrounding conditions affect decisions to leave the agricultural sector in a linear manner; in particular, agricultural labour migration is fostered by increasing levels of the income gap between the agricultural and non-agricultural sectors, decreasing levels of unemployment in the economy and growing levels of population density. Following Bertoni and Cavicchioli (2016b), we consider potential successors’ willingness to succeed as a complement of their choice to migrate out of the agricultural sector. For this reason, we include incgap, popdens, agrshare and empl to plug OCT into the farm succession analysis. In doing so, we also test the non-linear effects of these variables by entering their linear and squared terms. It is worth noting that for the abovementioned variables, both the MEMs and the semi-elasticities take into account their non-linear effects.

5. Results

The influence of each explanatory variable on the probability that a child is willing to take over the farm is shown in Table 3. The estimated model explains a large share of the variability in the dependent variable, with a pseudo R-squared of 0.55. The percentage of correct predictions is 87.5%. The variables with a statistically significant effect on the probability to take over the farm are those with a $P > |z|$ value smaller than 0.1.

Table 3 - Results of estimated logit model of farm succession

<p>| Variables   | Parameter estimates | $P&gt;|z|$ | Marginal effect at the means $(dy/dx)^a$ | Pr change for 1% increase in x $(dy/Δ1%x)^b$ |
|-------------|---------------------|--------|----------------------------------------|------------------------------------------|
| Child gender | -3.436              | 0.000  | -42.818                                |                                          |
| Child age   | 0.040               | 0.074  | 0.346                                  | 0.105                                    |</p>
<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>z Value</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child order</td>
<td>-1.043</td>
<td>0.000</td>
<td>-9.109</td>
<td>0.000</td>
</tr>
<tr>
<td>Farmer degree</td>
<td>-2.907</td>
<td>0.000</td>
<td>-52.594</td>
<td>0.000</td>
</tr>
<tr>
<td>Farm children</td>
<td>0.272</td>
<td>0.098</td>
<td>2.378</td>
<td>0.019</td>
</tr>
<tr>
<td>Farm duration</td>
<td>0.046</td>
<td>0.000</td>
<td>0.400</td>
<td>0.169</td>
</tr>
<tr>
<td>Farm duration</td>
<td>0.032</td>
<td>0.037</td>
<td>0.276</td>
<td>0.098</td>
</tr>
<tr>
<td>RPFV farm</td>
<td>4.898</td>
<td>0.000</td>
<td>44.543</td>
<td>0.000</td>
</tr>
<tr>
<td>Turnover_250</td>
<td>1.452</td>
<td>0.007</td>
<td>12.672</td>
<td>0.000</td>
</tr>
<tr>
<td>Growth</td>
<td>2.117</td>
<td>0.000</td>
<td>15.267</td>
<td>0.000</td>
</tr>
<tr>
<td>Distance</td>
<td>-0.002</td>
<td>0.000</td>
<td>-0.021</td>
<td>0.185</td>
</tr>
<tr>
<td>Rented land</td>
<td>-0.011</td>
<td>0.140</td>
<td>-0.097</td>
<td>0.428</td>
</tr>
<tr>
<td>Emplwork</td>
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<td>0.040</td>
<td>-0.214</td>
<td>0.033</td>
</tr>
<tr>
<td>Farm_costs/worker</td>
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<td>0.000</td>
<td>-0.212</td>
<td>0.033</td>
</tr>
<tr>
<td>Popdens</td>
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<td>0.000</td>
<td>-0.029</td>
<td>0.976</td>
</tr>
<tr>
<td>Popdens squared</td>
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<td>0.000</td>
<td>0.000</td>
<td>0.999</td>
</tr>
<tr>
<td>Empl</td>
<td>25.640</td>
<td>0.000</td>
<td>16.619</td>
<td>0.000</td>
</tr>
<tr>
<td>Empl squared</td>
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<td>0.000</td>
<td>-0.252</td>
<td>0.011</td>
</tr>
<tr>
<td>Agrshare</td>
<td>-0.448</td>
<td>0.313</td>
<td>-3.911</td>
<td>0.000</td>
</tr>
<tr>
<td>Incgap</td>
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<td>0.004</td>
<td>6.174</td>
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<td>Incgap squared</td>
<td>0.086</td>
<td>0.007</td>
<td>0.086</td>
<td>0.416</td>
</tr>
</tbody>
</table>

Regional dummies: Yes
Altimetry dummies: Yes

Number of observations: 216
Log-pseudolikelihood: -65.605
Pseudo R²: 0.552
% of obs. correctly classified: 87.5%
Yes=1: 86.1%
No=0: 88.5%

All variables referred to as children’s characteristics affect the probability of succession. Particularly, the birth order of farm children (child order) is significantly associated with succession probability (MEM of -9.11%). The interpretation of this MEM is that the succession probability decreases by 9.11% as the variable child_order increases by 1-point from its mean value (1.66), keeping all the other variables at their mean value. Being such discrete variable, its MEM is not informative. For this reason, we have computed the change in succession probability passing from the first to the second child (-8.12%).

Child succession probability is deeply affected by his/her gender (child gender), being 42.8% lower for females with respect to their male counterparts. Succession probability grows by
0.105% as a consequence of a 1% increase in child age (semi-elasticity in the last column of Table 3), even though this variable is only significant at the 10% level. Unexpectedly, the number of potential successors in the farm family (farm children) increases the succession probability of each child, with a statistical significance near 10%. Moving to farm and farmer characteristics, the child succession probability decreases by 52.6% when the farmer holds a degree. On the other hand, this probability is higher among bigger farms both in physical (farmland) and economic terms. For farms having a yearly turnover greater than 250,000 Euro (turnover_250), the estimated MEM is +12.7%. Also, the farm duration influences the probability of succession; in fact, the older the farm, the higher the probability of child succession (7.87% succession probability change between a farm founded 20 years ago and another founded 50 years ago). Likewise, child succession is more likely in thriving farms. In fact, the variables growth and farm_costs/worker are both statistically significant. Children living on farms whose turnover has increased since the year 2005 are more likely to inherit the farm (MEM=15.3%); the same finding applies to farms having lower costs per worker (farm_costs/worker). The more distant (variable Distance) the farm from the headquarters of the PO, the lower the child’s probability of inheriting it. Furthermore, succession probability is 44.5% higher among RPFV farms than other horticultural farms. The share of hired labour (emplwork) discourages succession, while the rented land does not play any significant role.

Finally, we test the effect of the local labour market and surrounding socio-economic conditions. All estimated parameters belonging to this category have a statistically significant effect (P<0.01), with the exception of agrshare. Furthermore, popdens, empl and incgap exert a nonlinear effect on child succession. The population density of the neighbouring region has a negative linear effect and a positive effect of the squared term, yielding a U-shaped relation. The regional employment rate (empl) presents a sizeable linear effect that seems to counterbalance the negative effect of the nonlinear term, resulting in an overall MEM of
5.8%. Also, the relation between child succession and the income gap (incgap) is well described by a U-shaped relation, given by a negative estimated coefficient for the variable in level and a positive one for the quadratic specification. In this case, the estimated MEM is +1.6%. The magnitude of the semi-elasticities (last column of Table 3) of the surrounding context variables is higher than that of other covariates. Figs. 1-6 plot the effect of increasing values of labour market and context variables (popdens, empl and incgap) on child succession probability. These trends are split according to the gender (child gender) and the birth order (child order) of potential successors. Note that such plots report the child succession probability computed for different levels of labour market and surrounding conditions and children’s characteristics, keeping all the other covariates at their mean values. As this last condition is unlikely, the plots have to be interpreted as indicators of trend lines rather than as precise quantifications of the probability of succession. Finally, we include in the model regional and altimetry dummy variables to control for unobserved territorial variability.

Figs. 1,2,3,4,5 and 6 – Change in child succession probabilities (by gender and birth order) for increasing values of population density, employment rate and income gap between the agricultural and non-agricultural sectors (vertical red line is the mean of the variables on the horizontal axis)
6. Discussion

In accordance with previous studies, we find several farm and farm household characteristics affecting children’s willingness of take over the family farm. We also find significant effects of child-level characteristics and local labour market and surrounding conditions. We test determinants of farm succession at the child level, using the child orientation to prosecute the agricultural activity in his/her farm as a proxy of the succession. Furthermore, as the data used come from a survey designed for informative aims on horticultural farms belonging to a POs consortium, the results should be considered representative of Italian professional horticultural farms organized in POs. Furthermore, as stated in the data description, our sample is mainly representative of a particular category of professional horticultural farms, namely, RFPV. Therefore, our findings may be extended to and representative of this sub-
category of farms and, in general, professional horticultural farms, as the sample covers 8% of this group in the reference area. The extendibility of our results to the rest of the agricultural sector is debatable. However, as discussed below, our findings on the effects of farm and farmer characteristics on succession are consistent with previous evidence in the agricultural sector.

Our discussion starts by commenting on the effects of the variables that have been less explored in previous works on farm succession (e.g., child-level and labour market/contextual variables), both in isolation and in interaction. The effects of other farm and farmer characteristics will be discussed later.

6.1 Discussion I: the effect of birth order, gender and labour market conditions on child succession probability

According to our results, the highest probability of succession is associated with the first-born child on the family farm and decreases when moving to subsequent heirs by 9.11%. To the best of our knowledge, this finding is the first contribution that measures the birth-order effect on farm succession probability. We use this variable referring to the literature on firm succession. Our results are congruent with part of the firm succession literature (Falkiner et al., 2017; Bennedsen et al., 2007; Sharma and Irving, 2005; Chrisman et al., 1998), suggesting that familial and social norms, which privilege first-born children, persist within the agricultural sector or at least among professional horticultural farms. However, our results provide different evidence with respect to another strand of literature in family firm succession, suggesting a switch of priorities from gender and birth order to attitudes and meritocracy (Brockhaus, 2004; Chrisman et al., 1998; Drozdow, 1989).
Regarding other child characteristics, we find that the succession rate increases strongly if the potential heir is a male (+42% probability). This result confirms those of many studies in the agricultural sector, both at the farm level (Glauben et al., 2009; Kerbler, 2008; Glauben et al., 2004; Keating and Little, 1997) and at the individual level (Cavicchioli et al., 2015; Simeone, 2006). Such evidence may be due to the particular features of the sample examined (professional horticultural farms) that have a strong level of specialization and where diversification activities, such as direct selling and agritourism, are marginal. According to previous evidence (Sharpley et al., 2006; Benjamin and Kimhi, 2006; Cassel and Pettersson., 2015), such activities are those in which women working in agriculture are usually more involved.

The evidence in family firm succession is mixed in determining the role played by both the gender and the birth order of potential heirs; some authors have found such characteristics (i.e., being male and the first-born heir) to be important in appointing the successor (Falkiner et al., 2017; Ahrens et al., 2015; Bennedsen et al., 2007; Sharma and Irving, 2005), while other scholars suggest that gender and birth order are less prominent in choosing successors (Brockhaus, 2004; Chrisman et al., 1998; Drozdow, 1989).

The child’s age is linearly correlated with farm succession, while the quadratic specification (not reported) does not give a significant result, in contrast to the findings of Aldanondo Ochoa et al. (2007), who detected a U-shaped relationship. However, the estimated linear coefficient is also significant only at the 10% level. The same level of significance ($p=0.098$) applies to the number of children in the family farm, whose effect is positive. This result seems counterintuitive, as the probability of individual succession is fostered by the number of other potential heirs, which is explainable by a competition effect among children. In fact, while in farm-level analyses (Bertoni and Cavicchioli, 2016b; Stiglbauer and Weiss, 2000), the number of children increase the succession probability previous studies at the child level
find the opposite result (Cavicchioli et al., 2015; Aldanondo Ochoa et al., 2007). However, our results are in line with those of Mann (2007), which suggests a positive relation between the number of male children on the farm and the probability of succession for each son.

The variables on the local labour market and neighbouring features (popdens, empl, agrshare, incgap) are used to plug OCT into the farm succession analysis. In this way, we treat the choice of potential successors to take over the family business as the counterpart (the opposite) with respect to their decision to find an off-farm job in a non-agricultural sector. According to OCT, the migration of workers from agricultural to non-agricultural sectors is influenced by the income gap between the two sectors, low levels of unemployment and high levels of population density (Olper et al., 2014; Larson and Mundlak, 1997; Barkley, 1990). The last two variables, along with the relatively smaller size of the agricultural sector, increase the probability of finding non-agricultural employment. Given that our dependent variable is the opposite of the choice to find non-agricultural employment, it is noteworthy that the expected effect of the labour market/territorial variables should be negative for popdens, empl and incgap, while the expected effect should be positive for agrshare. We find a nonsignificant effect of the relative size of the agricultural sector (agrshare) on the individual decision to take over the family farm, while the other three variables play a significant role. The effects of income gap and population density are in line with those predicted by OCT applied to farm succession. On the other hand, the level of employment of the local labour market exerts a positive effect on the willingness to take over the family farm, which is not in line with the expected outcome. To better explore this discrepancy between expected and actual results, possible nonlinear effects of the three variables have been tested, with their linear and quadratic forms entered in our specification. It turned out that all three variables exert a significant nonlinear effect on the willingness to take over the farm. This result is quite innovative with respect to OCT, which assumes only linear effects.
To obtain a more accurate representation, we plot farm succession probability for increasing levels of population density (Fig. 1-2), local employment rate (Fig. 3-4) and income gap (Fig. 5-6) within the sample intervals of each variable. Furthermore, for increasing values of these variables, we compute separately the farm succession probability for different levels of child order (Fig. 1, 3 and 5) and child gender (Fig. 2, 4 and 6).

In all the three abovementioned cases, the nonlinear relationships result from a combination of anti-succession and pro-succession effects: the former are explained by OCT, while the latter are explainable by a pool of considerations, presented hereafter. Even if our results suggest a curvilinear relationship for each variable, the pro-succession or anti-succession effect may be prevalent, depending on how the observations are distributed before and after the turning point. For instance, looking at Fig. 1 and 2 (popdens), the main part of the observations lies in the decreasing branch of the plot, meaning that the anti-succession effect of population density is prevalent with respect to its pro-succession effect. In Fig. 3-4 (empl) the main part of the observations is in the increasing branch of the plot, suggesting that the pro-succession effect of employment rate is stronger than its anti-succession effect. In the plot of incgap (Fig. 5-6), the observations on the increasing branch are prevalent.

It is worth noting that increasing levels of population density first depress farm succession up to the turning point of the plot (until approximately 800 inhabitants per km2) and then promote it; however, the former trend is decisively prevalent and is in line with the anti-succession effect of popdens, predicted by OCT. For this reason, the effect of population density may be considered almost linear and negative. This result is divergent with respect to other previous contributions. For instance, Lange et al. (2013) found a correlation between farm continuity and the level of urbanization. According to Zasada et al. (2011), densely populated areas provide a beneficial environment for horticultural and greenhouse farms. The main argument of this line of contributions is that farms near urban centres (or at the rural-
urban interface) gain higher benefits from multifunctional and diversification activities
(Zasada, 2011; Sharp and Smith, 2004). As our sample includes mainly professional
horticultural farms, where such activities are relatively marginal, it is plausible that there are
different effects of urbanization and population density on succession, compared to the
abovementioned contributions.

Turning to the effect of empl (Fig. 3-4), farm succession is fostered below the threshold of
approximately 51% of the employment rate (increasing branch of the plot). Such pro-
succession effect of empl contrasts with its predicted role according to OCT and needs a
different explanation. As in our sample, the employment rate is highly correlated (0.86) with
per-capita income in non-agricultural sectors, the pro-succession effect of employment rate
may be mediated by high levels of non-agricultural income. Most likely, the proximity to
richer areas may provide the horticultural farms with higher market opportunities (Wästfelt
and Zhang, 2016; Mackenbach et al., 2015; Inwood and Sharp, 2012; Jackson-Smith and
Sharp, 2008; Gulati et al., 2007). Beyond the turning point, the anti-succession effect of the
employment rate predicted by OCT countervails and overcomes its pro-succession effect.

The nonlinear effect of incr on succession willingness diverges, in part, from what was
expected. Our findings are congruent with theoretical expectations (linear negative effect)
until a certain level of incr (21,000 EUR), while differs beyond this threshold. The
interpretation of these results is quite difficult, as it could rely on the pro-succession effect
due to being localized in a relatively wealthy area with improved market opportunities for the
farm. However, in our sample, the level of incr and per capita non-agricultural income are
not correlated.

The abovementioned non-linear effects of labour market and neighbouring conditions
variables on child succession probability are differentiated by birth order (Figs. 1, 3 and 5)
and by gender (Figs. 2, 4 and 6). These nonlinear relationships are less pronounced for first-born and male potential successors, while they are more marked for non-first-born and female heirs. In general, as previously evidenced in Table 3, for changing levels of labour market and surrounding conditions variables, the estimated child succession probabilities are higher for first-born and male heirs, while they are lower for other siblings (non-first-born heirs and females).

6.2 Discussion II: the effect of farm and farmer characteristics on child succession probability

The probability of child succession is 52.6% lower on farms where the farmer holds a degree. Previous evidence is puzzling in this regard: some found a higher probability of succession when the farmer has a high school diploma (Cavicchioli et al., 2015; Mishra and El-Osta, 2008; Kimhi and Nachlieli, 2001; Stiglbauer and Weiss, 2000) or a degree (Simeone, 2006), while others confirm our findings (Mishra et al., 2010; Corsi, 2009). If a higher level of operator’s education may foster farm economic performance and its attractiveness for a successor, on the other hand, it may increase the ability and openness of potential heirs to find alternative employment. In our case, the latter effect overcome the former. We find a significant effect of some farm characteristics on children’s intentions of succession. The physical and economic dimension of the farm (variables farmland and turnover_250) increase the probability that a child will take over the farm, confirming the results of Glauben et al. (2004) and Aldanondo Ochoa et al. (2007) for the physical dimension, as well as the findings of other authors for the economic dimension of the farm (Bertoni and Cavicchioli, 2016b; Cavicchioli et al., 2015; Mishra et al., 2010; Corsi, 2009; Glauben et al., 2009; Kerbler, 2008). Similar to Mishra and El-Osta (2008), we find that children living on farms with
increasing turnover over the past five years are more likely to take over the farm. We also test the effect of cost per worker (farm efficiency) on farm succession. Intuitively, the higher the production costs per worker, the lower the probability of a potential heir’s succession. Also, the effect of the variable distance suggests that farms far from their PO headquarters are less likely to find successors, supporting the idea that higher costs due to logistic disadvantages play a role in succession dynamics.

The abovementioned evidence suggest that an heir’s succession probability is higher among larger, thriving and more efficient farms; this notion is congruent with the higher succession probability among RPFV farms (+44.5%). This evidence suggests that a willingness to succeed is also influenced by individual gratification of operating in a stimulating and challenging working environment (along with the actual profitability of the farm). In our sample, this condition is most frequent among RPFV farms, which are more technologically advanced and inclined to innovation due to a closer interdependence within the supply chain (Russo Spena and Colurcio, 2010; Fouayzi et al., 2006; Fearne and Hughes, 1999). Notably, in RPFV farms, the succession rate of male children (76%) is far higher than that of female children (34%), confirming a different effect of farm specialization on succession trajectories by gender.

The “age” of the enterprise since its foundation (farm_duration) increases the probability of child succession, confirming the farm-level results of Bertoni and Cavicchioli (2016b). This evidence has two non-mutually exclusive explanations. First, the child may feel himself/herself responsible for continuing and renewing a long family tradition (Hauck et al., 2016; Glauben et al., 2009). Second, a longer family business tradition allows for a greater accumulation of human capital and farm-specific skills, representing an incentive for younger farmers to prosecute farming activities.
We test the effect of the share of rented land (*rented land*), meant as a complement of family farm wealth. The rationale behind this approach is that intergenerational farm succession also implies a transfer of physical assets, along with skills and responsibilities (Grubbström and Sooväli-Sepping, 2012; Lobley, 2010; Lobley *et al.*, 2010; Calus *et al.*, 2008; Uchiyama *et al.*, 2008). We find that a higher share of rented land discourages child succession, confirming the results of Glauben *et al.* (2004, 2009) and contradicting those of Simeone (2006) and Mann (2007). Most likely, the land rented may not be available for future farming activity, representing a source of entrepreneurial risk for potential successors, thus discouraging them from taking over the farm. We find an inverse relationship between the share of hired labour and the probability of succession, explainable in terms of the discouraging effect of higher responsibilities and commitments in assuring a stable income for hired workers.

**Conclusions**

In this paper, we examine the drivers of farm transfer in a sample of Italian horticultural farms. Our contribution covers some relatively unexplored aspects of farm transfer related to the characteristics of potential successors (gender, birth order) and to patterns and dynamics of local labour markets and surrounding conditions. For this reason, the present paper is at a crossroads and merges three different strands of literature: *i)* farm succession analysis, *ii)* child gender and birth order effects in firm succession, and *iii)* farm labour migration/occupational choice theory. The last two aspects have also been analysed in their interaction.

We find that male and first-born potential successors are more likely to take over the family farm. Previous comparable results in business management firm succession are mixed: for some authors, gender and birth order are important characteristics in child succession, as a
consequence of familial and social normative beliefs. This phenomenon may also be the case for the agricultural sector, particularly for professional horticultural farms.

Using some local labour market and surrounding context variables (income gap, employment rate and population density), we plug the farm labour migration/occupational choice theory into the farm succession analysis. Our results are, in part, divergent from those predicted by farm labour migration theory, which points to a linear negative effect of these variables on farm succession. Unexpectedly, we find that increasing levels of income gap and population density exert a nonlinear U-shaped effect on child succession, while increasing rates of employment affect succession in a bell-shaped fashion. However, within each nonlinear relationship, there is one trend that is prevalent. For example, increasing levels of population density are mainly depressive of farm succession, in line with the prediction of OCT. On the other hand, increasing levels of the employment rate in the area surrounding horticultural farms tend to favour succession. Even if this finding is in contrast with OCT, it may be explained by the high correlation between employment rate and per-capita income in our sample. In fact, being located in proximity of wealthy areas may provide better market opportunities and services to professional horticultural farms that have become more attractive for potential heirs. On the other hand, beyond a certain threshold of economic prosperity, this pro-succession effect is counterbalanced by the attractiveness of non-agricultural employment for farmers’ children. The most unexpected result is the prevalent pro-succession effect of income gap on heirs’ willingness to take over the horticultural farms.

In fact, according to OCT, the gap between non-agricultural and agricultural income should be the main driver of out-farm migration, and, consequently, its increase should discourage farm succession.

The nonlinear effects of labour market and contextual variables are more pronounced on the probability of child succession when potential heirs are female and non-first-born. Given the
importance of rural youth migration and female employment in agriculture, these interactions are worth examination in greater depth. Furthermore, the use of contextual and child-level variables allows for a more accurate estimation of the effect of farm and farmer characteristics on the probability of child succession.

The results of the present analysis are limited to and representative of a particular category of farms (professional horticultural) located in Italy and belonging to PO consortia. Despite the peculiarity of the sample examined, our findings confirm those of many previous studies, pointing to trajectories in child succession dynamics that are common to the entire farming sector. Nevertheless, these trends show a different intensity (in terms of, for instance, succession rate by gender) according to the field of specialization of the farms. In this respect, further research is needed to shed light on the effects of child characteristics and labour market/surrounding conditions on farm succession and youth migration in other farm typologies. In particular, it would be worth examining whether and to what extent the impact of birth order and gender on the probability of child succession changes across different farming typologies. Furthermore, as the characteristics of the successor may affect farm management, it would be advisable to measure the effect of birth order on the post-succession economic performance of the family farm. This analysis would allow for the testing of whether the persistence of familial and normative beliefs on primogeniture and male-line succession may represent a source of economic inefficiency in farm management.

**Acknowledgements**

Data used in this paper have been gathered in the research project “AOP UNOLOMBARDIA: il primario avanzato—Progetto per lo sviluppo di una struttura a rete che assista la

References


Bertoni, D., Cavicchioli, D. 2016b. Farm succession, occupational choice and farm adaptation at the rural-urban interface: The case of Italian horticultural farms. Land Use Policy 57: pp. 739-748


Drozdow, N. (1989). Thinking that is intuitive to the boss must be chartered for the next generation. Business Week Newsletter for Family-Owned Businesses 1(19)


Gaviglio, A., Bertocchi, M., Marescotti, M.E., Demartini, E., Pirani, A. 2016. The social pillar of sustainability: a quantitative approach at the farm level. Agricultural and Food Economics 4:15


Morais, M., Binotto, E., Borges, J.A.R. 2017b. Using the reasoned action approach to understand Brazilian successors’ intention to take over the farm. Land Use Policy.


Väre, M., Pietola, K., Weiss, C.R. 2010. The irrelevance of stated plans in predicting farm successions in Finland. Agricultural and food science 19: pp. 81-95


