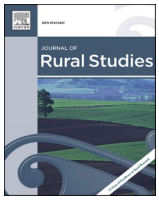
Journal of Rural Studies 114 (2025) 103583

Contents lists available at ScienceDirect

Journal of Rural Studies

journal homepage: www.elsevier.com/locate/jrurstud



Structure and determinants of the cost of setting up a farm: The case of young farmers in Central France

Philippe Jeanneaux [a,*], Eliot Wendling [a], Yann Desjeux [b], Geoffroy Enjolras [c], Laure Latruffe [b]

[a] VetAgro Sup, Univ. Clermont Auvergne, AgroParisTech, INRAE, UMR Territoires, Lempdes, F-63370, France
[b] INRAE, Univ. Bordeaux, CNRS, BSE, UMR 6060, UMR 1441, Pessac, F-33600, France
[c] Univ. Grenoble Alpes, Grenoble INP, CERAG, Grenoble, F-38000, France

ARTICLE INFO

Keywords:
Farm
Young farmer grant
Value
Setting-up costs
Transaction price
Investments

ABSTRACT

The experience of young farmers setting up in business has important implications for the rejuvenation of the age profile of the farming profession. The cost of taking over a farm is a key factor governing access to the profession. We focus here on the cost that young farmers must incur in order to take control of a farm business, and the determinants of this cost at the time of transfer. The contribution of this paper is that we investigate the total cost of setting up a farm, which includes not only the purchase price paid by the farmer on taking over the farm, but also the cost of adapting the farm for their projects and needs; that is, the investment costs in the first 4 years following the set up. Our analysis is based on an original database of administrative records for grants to young farmers in the French region of Puy-de-Dôme during the period 2007–2017. The results show that the average purchase price is around 80,000 Euros, while the investment required during the first 4 years following set-up is an additional cost of almost 200,000 Euros. The total cost of setting up depends on the young farmer's age and education, the size of the farm, its legal status, the main production on the farm, and the levers used to create value, such as short supply chains, on-farm processing, and using a quality label, however, producing using organic practices and setting up in a family context do not influence the cost.

1. Introduction

The changing age profile and generational renewal in the farming profession is linked to an array of economic, social, demographic and political factors (Lobley and Baker, 2016; Teagasc, 2014; European Commission, 2021). One of the key underlying processes is farm transfer. This implies a change in the ownership of the factors of production or capital of a farm, but it also involves the transfer of a system of symbolic values and a history which is often intertwined with that of a family (Coopmans et al., 2021; Jeanneaux et al., 2022). Farm sale price is largely defined by the perceived value of the farm being sold, encompassing both social value (Jacques-Jouvenot and Schepens, 2007; Conway et al., 2016; Bertoni et al., 2023) and economic value (Calus et al., 2008; Jeanneaux et al., 2022). Economic value depends upon the assets of the farm, its size, its financial characteristics and the type of buyer, whereas social value is determined by the seller's attachment to the holding and the farming way of life, the cognitive cost of selling up and/or ceasing the activity, and the ties with the buyer.

In this article, we contribute to the literature on farm transfer and farm value by investigating the full cost of setting up a farm; including not only the purchase price paid by the farmer on taking over a farm, but also the investment costs of adapting the farm to their projects and needs in the first few years following the set up. We then study the determinants of such setting up costs in order to understand the farmers' choices during farm transfers. Our objective is to provide knowledge on the investment choices of young farmers setting-up and their impacts. More precisely our research question is twofold: (i) what is the cost that a transferee must bear in order to take control of a farm business? (ii) what are the determinants of this cost at the time of transfer? Our contribution to the literature is threefold: first, we add to the rare studies analysing farm valuation processes, especially in the context of transfer; second, our study uses original data based on real transactions; third, our study considers not only the direct transfer value, but also the post-transfer investment costs.

Our data are for the Puy-de-Dôme region in central France for the period 2007–2017, using original data for farmers under 40 years old who are setting up and receiving the CAP young farmer grant. In section 2 we provide some background. In section 3 we present the study area,

* Corresponding author. Université Clermont Auvergne, VetAgro Sup, UMR Territoires, 89, avenue de l'Europe, Lempdes, 63370, France.
E-mail address: philippe.jeanneaux@vetagro-sup.fr (P. Jeanneaux).

https://doi.org/10.1016/j.jrurstud.2025.103583
Received 15 May 2024; Received in revised form 8 January 2025; Accepted 17 January 2025
Available online 25 January 2025

econometric model and the database, while in section 4 we describe the data. We discuss the econometric results in section 5 and conclude in section 6.

2. Background

2.1. The importance of farm value

Farm transfer requires knowledge of the price of the farm estate or its components such as farmland, assets and livestock. Information on farmland prices is widely available and detailed, as there is a strong market for land. For example, in 2022, the average price of a hectare of arable land in the EU was €10,578 (€6130 for France) (European Commission, 2021). The average price of arable land in England rose by 4% between 2022 and 2023, with an average price paid of £11,300/acre (Strutt and Parker, 2024). Over 70% of arable land sold in England in 2023 was at a price above £10,000/acre. However, the farm market is opaque (Garcia et al., 2017). Information on farm estate prices remains rare and lacks details on the exact contours of the property for sale. The final price resulting from the negotiation between buyer and seller, with the help of advisors or experts, is generally unknown.

Several methods exist for estimating the value of a farm (Jeanneaux et al., 2022). On the one hand, the asset-based valuation method, or patrimonial value method, offers a tangible approach to determining the worth by focusing on the business's assets rather than its earnings or market potential. This patrimonial value method is part of methods for assessing the trade value. It is based on the valuation of a farm's existing assets, with an accounting or market estimates of the value. This approach generally uses a revalued net asset method to better link the market price of assets to the net book value of balance sheet assets. In this context, some research has focused on the inclusion of intangible assets (European Commission, 2021). On the other hand, the discounted cash-flow (DCF) method, also known as the capitalisation method or return value method, is based on the ability of the business to generate cash flows, taking into account market potential. It relates the value of an asset to the present value of expected future cash flows on that asset. Such a technique is described in specialist works (Damodaran, 2005) and, although not as common as the patrimonial method in farming, it is often used by professionals (Latruffe et al., 2023), and could be useful to estimate post-takeover investments.

The value of a farm is critical for farm transfer as it is the basis of the price that will be set for the transaction. However, this is not the only cost that transferees have to face when entering business. Indeed, the total cost of setting up on a farm corresponds to the purchase price of the farm at the time of takeover, to which has to be added the amount of post-takeover investments. The transfer of a farm is a lengthy process, extending beyond the deed of sale and often involving additional investment or the deferred acquisition of certain assets over a period of 4–5 years (Coopmans et al., 2021; Bertoni et al., 2023). Post-transfer investments, necessary to modernise existing assets or start up a new activity, are often spread over the 4 years following the farm takeover. Thus, the total cost of setting up provides a consistent measure of the value attached to the farm by its purchaser.

2.2. Farm value, profitability and investments

Profitability and farm value are linked, because the factors that affect profitability have an effect on farm value. A more profitable farm will be more attractive for transferees, and therefore will have a higher value. On the other hand, misallocation of resources or poor investment choices can negatively affect profitability and therefore return on investment, and ultimately farm asset value.

Investments are necessary in agriculture (for increasing the scale of production, modernisation of equipment, compliance with regulations, etc.), particularly in the phase of farm transfer (Bertoni et al., 2023). Investments are therefore part of the total cost incurred by transferees when taking over a farm, in addition to the farm price. However, investments may also affect the farm value itself through its effects on performance. Several researchers have investigated the effect of investment on farm performance in Europe but the results are not clear-cut. A positive effect may be observed due to an improvement and modernisation of work equipment, which in turn improves productivity (Nilsson and Wixe, 2022) or results in a more efficient combination of production factors (Ratinger et al., 2013). One of the main transmission channels identified in the literature that explains the positive effect of investment on productivity is technological change (Rasmussen, 2010; Alston and Pardey, 2016). By contrast, some researchers argue that farmers may make bad investment decisions, leading to a negative impact on farm performance. Nilsson and Wixe (2022) show that there are significant time lags between investments and observable effects in the short term, confirming that some impacts of investments on performance may only be visible 3–5 years after investment has taken place (Bertoni et al., 2023).

Investing means sacrificing immediate resources in the hope of obtaining more in the future. Bourdieu et al. (1997) highlighted the issue of the irreversibility of investment, because in addition to the cost of purchasing new goods, there are costs associated with setting up and adaptation to new equipment. It is these adjustment costs that may result in a decrease in farm performance and profitability in the few years following the investment. Zhengfei and Oude Lansink (2006) provide evidence of such a decrease in performance which they explain by a period of adaptation during which newly set up farmers take on debt to invest and develop the farm. They show that these investments, in the short term, negatively impact the level of performance of farms. They also suggest that the presence of a successor on the farm may reduce the decline in performance, as young farmers are more inclined to diversify activities and adopt more sustainable farming practices. Wright and Brown (2019) underline a difference in the propensity to diversify activities, which is higher for non-inherited farms than for inherited farms - in other words, the family context plays a crucial role in the process of transferring a farm and the linked investments.

As outlined above, investing is a decision that often arises at the crucial stage of farm transfer. Indeed, ensuring the future of the farm is often one of the most important concerns for a farmer. This observation is as true for a family farm as for a non-family farm (Pesquin et al., 1999; Gasson, 1993). The decision to transfer may change the investment behaviour of the transferring farmer. The transferring farmer may consider actions to develop the farm and make it more attractive to transferees. It is also a way for the owner to make the farm more viable, as highlighted by Lobley and Baker (2016) and Wheeler et al. (2012). Gaté and Laure Latruffe (2016) studied the difficulties encountered during the transfer of a farm in the case of the region of Brittany (France) and reported that some future transferors adopt an investment strategy near their retirement, with the aim of facilitating the setting-up of the transferee. For Mann et al. (2013), this investment strategy is only viable when there is a successor on the farm, as selling the assets would be more rational for farms without a successor. By contrast, Wright and Brown (2019) indicate that the investment decision may be motivated by the preparation of the future successor. This is in line with previous research indicating that successions are more likely to occur on farms with a high level of investment (Calus et al., 2008; Glauben et al., 2009).

2.3. Determinants of farm value

While the literature on the determinants of farm value is rare, the literature on the determinants of investment and of farm performance is helpful in this regard, as these 3 concepts are interrelated as explained above. Viaggi et al. (2011) summarised the main factors determining investment behaviour into 3 groups: (i) technical factors; (ii) economic factors; (iii) household characteristics and farmers' attitudes. Setting up in business is a difficult and usually costly process for farmers. It requires certain skills (education, professional experience) and social capital

(family background, connection to the seller, belonging to a broader network of farmers, as well as economic and financial capital (linked to bank loans, family members' donations, land ownership, etc.).

The literature on the determinants of farm succession is also insightful (Bertoni et al., 2023; Cavicchioli et al., 2018; Corsi et al., 2009; Kerbler, 2008). Wright and Brown (2019) show that the age of the transferee is positively related to farm performance, but that intra-family transfers negatively affect farm performance. However, this result is contradicted by Laband and Lentz (1983) who find that inherited farms perform much better than non-inherited farms. A potential negative decrease in performance can be alleviated when the transferee sets up on a farm that is reaching stability, or that is in partnership form, and so has a greater capacity to absorb the arrival of a new farm manager. Compared to sole proprietorship, the corporation form of organisation offers continuity, centralised management, easy ownership transfer, limited liability, and flexible financing. This may affect farm profitability, but also investment decisions.

Investing also means having to provide guarantees to which bankers are sensitive. The guarantees of the financial strength of the company are based on indicators such as equity, debts, liquidity, solvency, but also assets (their quality, diversity and value) and sometimes guarantees provided by the family. Thus, profitability and performance in the long term are influenced by human resources, namely, skills, managerial ability, experience, and so on (Gloy et al., 2002; Micheels, 2014). The effect may be positive as older farmers have greater experience, which may contribute to a higher value (Calus et al., 2008). On the other hand, younger farmers who are at the beginning of their farming lifecycle are in general dynamic, and invest to develop the farm, contributing to a higher value (Gale, 1994).

Turning now to specific variables that may impact the cost of setting up, Kryszak et al. (2021) highlight that a prominent factor of profitability and farm performance in general is the size of the farm, which can be proxied by farmland area. A positive link between farm size and profitability, and therefore farm value, can be expected. Indeed, the greater the size, the more weather risks are spread (Wan et al., 2016) and the higher the labour productivity, so increasing farm profitability (van der Meulen et al., 2014).

The number of workers has an effect on profitability, but this effect is ambiguous: a larger workforce may mean higher production costs, but it can also improve profitability by mobilising specific skills that create more value. Good working conditions can also be a strong incentive for workers and make them more efficient (Skevas et al., 2021). In addition, a large labour force may contribute to profitability as it increases the availability of adequate skills (Tey and Brindal, 2015), but it may also lead to supervision problems, transaction costs, and hence lower profitability. In addition, a large labour force may be a substitute for assets, thus reducing farm value.

While farm size, family transaction, the presence of employees and the profile of the buyer may all have an impact on the profitability and value of the farm, the strategy pursued by the farm is also important. According to Porter (1985), there are 2 basic types of competitive advantage that a corporation (and in our case, a farm) seeks to develop: cost leadership and differentiation. Because these strategies have direct effects on profit, they have effects on farm value. On the one hand, the cost leadership strategy is developed by a company's ability to produce something more efficiently than a rival, which leads to greater profit margins. In agriculture, geographic location, farmland quality or agro-food industry demand can create a comparative advantage. Farmers implement this strategy by seeking productivity gains in terms of labour, animals and land. Operating a larger agricultural area allows the modernisation and specialisation of production and reduces the average cost of production. On the other hand, there is a differential advantage (differentiation) when a company is able to produce goods that are considered to be both unique and of better quality, than those of a competitor. Cutting-edge technologies, craft and traditional processes, organic practices and the strong identity provided by a geographical indication, are all drivers of differential advantage and therefore of higher performance.

Finally, the investment needs vary for different agricultural products. While some products require large investments in equipment and materials, others require much less but require working capital. A European Investment Bank report on the financing needs in the agriculture and agro-food sectors in the European Union (Fi-compass, 2020) refers to the difference in investment between livestock production, and perennial and non-perennial arable crops. The report indicates, on the basis of a survey, that livestock producers have the highest demand for financing, and poultry and pork producers are the highest loan users. However, in each case, the motivations and context for investment are different. For livestock production, increased consumption justifies investment. For perennial and non-perennial arable crops, the production of high-quality wines and the increase in consumption of olive oil and fresh and dried fruits, are the main motivations for investment.

3. Database, study area and model

3.1. Database creation

In order to investigate the total set-up cost for young transferees, we have created an original database from applications for the young farmer grant ("dotation jeune agriculteur"-DJA) that is to say, CAP subsidies granted to farmers under the age of 40. Young French farmers wishing to set up on a farm and applying for setting up subsidies over the 2007–2013 and 2014–2020 CAP programming periods, had to meet certain conditions (MAAF DGPAT, 2015).

- ✓ Age requirement: between 18 and 40;
- ✓ Nationality requirement: European nationality or residence permit valid for at least 5 years for non-EU nationals;
- ✓ Training requirement: agricultural professional competence: level IV agricultural diploma (equivalent to high school diploma)[1] and approved personalised professionalisation plan;
- ✓ Farming conditions: setting up on a farm qualifying for the status of farmer; setting up on a farm qualifying for a viable income.
- ✓ Complying with the requirements for all relevant interventions under income support (also known as the "first pillar" of the CAP) and rural development (also known as the "second pillar" of the CAP).

Since 2014, 5-year additional direct payments from the first pillar of the CAP, amounting to approximately €50 million for France, have provided for young farmer support. This support is granted as income support. The French government has authorised tax and social charge exemptions, amounting to €75 million per year. In addition, Rural development interventions (CAP "second pillar") offer additional opportunities alongside "first pillar" support to help young farmers get started. Setting up of young farmers is a type of voluntary intervention by EU countries under the CAP rural development funds 2007–2013 and 2014–2020, which aimed to provide immediate support for the start-up of farmers and businesses. In France the financial support amounted to approximately €450 million per year. The budget for the young farmer subsidy dedicated to supporting set-ups was around €130 million, and the interest-rate compensation was less than €10 million. Investment support for young farmers amounted to €144 million. Finally, there was €35 million financed advisory and support services for young farmers (Cour des comptes, 2023).

We used records from applications that were received and registered between 2007 and 2017 by the local government agency in the French

[1] Those holding a level IV diploma not in the agricultural sector must undergo continuing education to obtain level IV in agriculture, but this period is shorter than high school education.

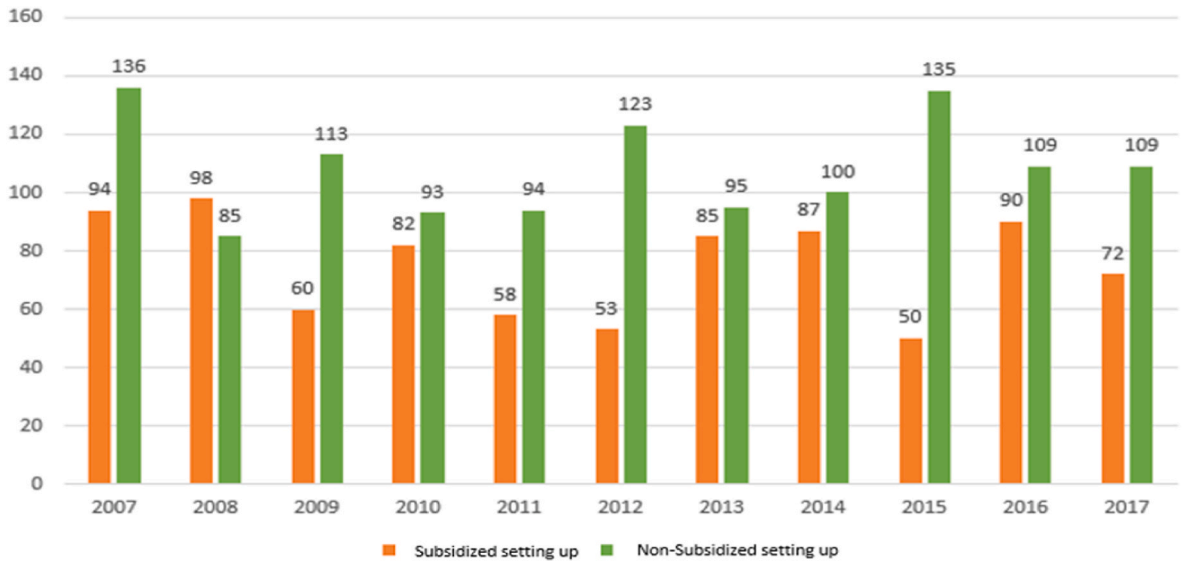


Fig. 1. Number of subsidised and non-subsidised (with young farmer support) farmers setting up in the Puy-de-Dôme region between 2007 and 2017 (Source: DDT 63). (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

region of Puy-de-Dôme (Central France) (Direction Départementale des Territoires du Puy-de-Dôme-DDT 63). In this region 841 farmers received a young farmer subsidy to set up, while over 1300 new farmers did not (Fig. 1). Each record contains a description of the applicant's project, as well as an investment and financing plan for direct transfer and for post-transfer investment made in the 4 years after setting up. The values recorded correspond to the takeover and post-transfer investment values that were negotiated between the transferee and the transferor.

The budget of the applicant's business plan available in the records is complete in the sense that it includes all the assets that the transferee must acquire, and all the financing means. All investments are registered at their gross value whether or not they benefit from a subsidy. In addition, the financing is recorded whether or not it is a donation. There is no transfer of ownership without there being a written record. Even if a parent decides to give a tractor to their child, this is a transfer of ownership right that is identified either by a simple change of registration document of the vehicle, or by a notarial deed. It would be incorrect to consider that a succession of an agricultural farm in the family business could be done without transfer of ownership or with transfers at non-real market values. This is for two reasons: (i) in France, all direct inheritor siblings have equal rights, and disinherited heirs may undertake litigation in courts; (ii) the tax administration in charge of recovering inheritance tax requires that transactions be transparent within the family and that the values defined for all assets are consistent with the market. The young farmer candidate must provide all quotes for the investments that will be made (equipment, livestock, buildings, etc.) and must also provide the loan agreements from the bankers. The investment and financing plan is then used to establish the budget of the business plan in order to assess the economic and financial viability of the project. In other words, the amounts of investment and financing are data that are fairly close to reality, even if during the implementation of the project, it is possible that certain investments are brought forward or postponed.

If the project is not viable, no young farmer set-up subsidy is awarded. If the project is viable, it is assessed by a committee of representatives of agricultural stakeholders and of the French government, who give the final approval for the young farmer to set up. At the time of his/her setting up, the young farmer receives 80% of the subsidy. The implementation of the project is monitored by specific services of the Ministry in charge of agriculture over a period of 4 years. If, at the end of the 4 years, the income objectives that were targeted by the young farmer applicant are achieved, the farmer will receive the 20% balance of the subsidy.

3.2. Study area

This study focuses on the French Puy-de-Dôme region where the diverse agricultural activities are fairly representative of the diversity of French agriculture (Agreste, 2022). Due to the extent of the mountainous area (75% of the region's surface area), grazing livestock farming is an important sector. In 2020 there were over 324,000 head of cattle and 117,000 head of sheep. 1080 farms (out of 5745) produced 340 million litres of milk with 56,000 dairy cows. There were 94,300 suckler cows on more than 1800 beef farms, producing around 90,000 calves, 40,800 of which were exported to Italy for fattening. The Puy-de-Dome also has a large area dedicated to multi-arable crop production (35% of Utilised Agricultural Area-UAA) with 1640 farms producing cereals. 1130 farms produced under quality labels (French "Label Rouge" which is an indication of high-quality product for meat; Protected Designation of Origin (PDO) for cheese and wine), and 606 were organic (27,700 ha accounting for 7% of the region's UAA).

The region is also a tourist area and highly urbanised, generating demand for a wide range of agricultural products (vegetables, cheeses, honey, poultry, wines, etc.). However, like all French regions, the region is struggling to renew its agricultural workforce. According to the government services in charge of the agricultural set-up policy, between 2007 and 2017 around 70% of exits were replaced, amounting to 2033 new farmers. Of these, 694 were over 40 years old, 1339 were 40 years old or under and would have been eligible for a set-up grant but only 841 received such a grant. Our analysis concerns only the farmers who received a grant, since no information is available for those who did not receive a grant.

3.3. The model and its variables

We are interested in the total cost of setting up (C), which includes the cost of buying the farm (transaction price P) and the cost of post-transfer investments (I), following the purchase by the young farmer (i):

$$C_i = P_i + I_i \quad (1)$$

In general, investments are carried out by farmers after the purchase of a farm in order to modernise equipment or to start new activities on the farm (Zhengfei and Oude Lansink, 2006; Bertoni et al., 2023), or are

Table 1
List of variables used to explain the cost of setting up.

Variable name	Description and codes	Type	Expected effect
Young farmer gender	Male: 1 Female: 2	Binary	Ambiguous effect. Women and men may select different types of farms but the direction is unknown a priori.
Young farmer age	Years	Quantitative	Ambiguous effect. Older farmers may be less likely to make large investment and thus may take over less costly farms, while young farmers may be short of funds and thus may take over less costly farms.
Young farmer education	Secondary Education: V Initial high school diploma: IV Post high school education: III Bachelor and/or Master degree: II	Categorical variable	More educated farmers have greater managerial skills and information, and may be more likely purchase large farms, thus raising total cost.
Transaction within the family	Family: 1 Non-family: 2	Binary	The family context may make it possible to reduce the amounts of assets to be taken over or may imply a reduced value of the assets, thus a less costly farm.
Farm legal status	Sole proprietorship: 1 Other: 2	Binary	Buying a fraction of a corporation's shares may be less expensive
Farm type of main production	Beef cattle or sheep: 1 Dairy (cow or goat): 2 Crop (cereals, vegetables, vineyard, fruits): 3	Categorical variable	Livestock farms are more capital intensive, may require more investment and may therefore be costlier.
Farm UAA (class by hectare)	Class [0; 52[ha: 1 Class [52; 102[ha: 2 Class [102; 152[ha: 3 Class [152; 202[ha: 4 Class [202; +[ha: 5	Categorical variable	Larger farmland sizes increase farm value.
Employees on the farm	Number	Quantitative	Employees bring specific skills and labour specialisation, which may increase the profitability and thus the value of the farm.
Organic farming	No: 0 Yes: 1	Binary	Higher revenues from organic products sales may increase the profitability and thus the farm value.
Short food supply chains	No: 0 Partially: 1 Totally: 2	Categorical variable	Higher revenues from products sold through short supply chains may increase the profitability and thus the farm value.
Quality label	No: 0 Yes: 1	Binary	Higher revenues from products sold with a quality label may increase the profitability and thus the farm value.
On-farm processing	No: 0 Yes: 1	Binary	Higher revenues from on-farm processing may increase the profitability and thus the farm value.

undertaken by the retiring farmer to anticipate an intra-family farm transfer (Calus et al., 2008; Gaté and Laure Latruffe, 2016). In our database, most investment costs are spread over the first 4 years after purchase, and therefore this is the period that we will consider for I. For consistency, all financial figures are in Euros at constant value (2010).

In order to investigate the determinants of the cost of setting up in business for young farmers, we selected a number of explanatory variables (Table 1), based on the literature on farm value and farm succession as presented above. These include, firstly, the young farmer's socio-demographic variables: gender, age, level of education and the type of transaction (whether or not the transaction occurred within the family). Secondly, variables characterising the farm and its strategy (cost leadership vs. differentiation), but relating to the project of the young farmer and not to the situation before the takeover, were included: farm size in terms of class of UAA; main production type; the number of employees working on the farm present on the day the farm was taken over; the legal status of the farm (sole proprietorship vs other e.g. corporate farm or partnership); the use of organic practices; selling under a quality label; selling through short supply chains; and whether or not the farm carries out processing activities. The main production types are threefold: beef cattle or sheep; dairy (cow or goat); arable crops, including vineyards, orchard and market gardening. A farm with several productions is allocated to the type for which its turnover is the highest. We created 5 classes of UAA, with a first class limited to 52 ha, an area that corresponded to the average size of French farms in 2010. Then the interval was increased by 50 ha for the following classes.

To study the determinants of the total cost C_i for farm i, we firstly estimate a linear model, as follows:

$$C_i = \alpha + \beta X_i + \varepsilon_i \tag{2}$$

where X_i is the vector of explanatory variables, α, β are the coefficients of the linear model to be estimated, and ε_i is the error term.

We also use an ordinal logistic regression model, as follows:

$$logit(p\ (C_i)) = log\left(\frac{p(C_i)}{1-p(C_i)}\right) = \alpha_l + \beta_l X_i \tag{3}$$

where p denotes the probability, X_i is the vector of explanatory variables, α_l, β_l are the coefficients of the logistic model to be estimated.

Logistic regressions are generalised linear models which allow observation of developments in certain variables "ceteris paribus". More specifically, using an ordinal categorical variable to be explained in hierarchical fashion can provide further insights into the determinants, depending on the level of C. We separate the total cost values C into 5 categories corresponding to 5 quantiles and, for each qualitative explanatory variable, we assume that the first value represents the standard situation with a coefficient of 1. While such an assumption does not create any problems of interpretation for the ordinal qualitative variables (such as the level of education), it does impede our interpretation of the coefficients associated with non-ordinal qualitative variables (such as gender), where one value serves as a benchmark for comparing the others. For the non-ordinal qualitative variables, we consider the most frequently-observed situations to be the reference. Finally, the coefficients are presented as odds ratios, which makes it easier to interpret the results. A variable can be considered significant if the associated odds ratio is greater than 1, and non-significant if the odds ratio is below 1.

After estimating the determinants of the total cost of setting up C, we do the same for the other two components; namely, the transaction price P and the post-set up investments I.

3.4. Database description

In the sample of 841 young farmers who received the young farmer grant between 2007 and 2017 in Puy-de-Dôme, 77% were men and 23% were women, with an average age of 28 and 32, respectively. Almost 98% of the sample had at least high school diploma (Level IV), among

Table 2
Characteristics of the 841 young farmers in Puy-de-Dôme who received CAP support to set up in business: changes between 2007-2009 and 2015–2017 for the period studied (Source: DDT 63).

	2007–2009	2015–2017
Young farmer age (years)[a]	28	29
Male young farmer	81%	76%
Sole proprietorship farm	34%	34%
Bachelor and/or Master degree	21%	16%
Transferred farm not in family of young farmer	34%	43%
Farm UAA (ha)[a]	101 ha	99 ha
Farm with beef cattle and sheep production	86%	81%
Farm with vegetable growing	5%	5%
Farm in mountainous area	75%	77%
Parents operating the transferred farm	58%	57%
Farm producing under organic farming	6%	19%
Farm with short food supply chain	23%	23%
Farm with on-farm processing	16%	22%
Young farmer setting up subsidies (Euros)[a]	€25,512	€24,742

Note: constant Euros 2010. Shares in the sample except.
[a] : Averages over the years.

which 23% had attained a Bachelor degree. 66% of the sample took over farms from within the family (versus 34% with no family connection). The non-family share stayed at this level in the early years of our period (2007–2009), subsequently rising in 2015–2017 to 43% of transfers. 34% of the young farmers in our sample had sole proprietorship, with the average UAA of these farms being 50 ha, while 66% of the sample joined a corporate or partnership farming structure, with an average size of 128 ha. The farms taken over were beef cattle and sheep farms (50%), dairy farms (cow and goat) (34%), and crop farms (16%). The majority of the farms (78%) were located in mountain regions. Finally, 11% of the farms set up produced under organic farming, 19% produced with a quality label (PDO or French "Label Rouge"), 25% sold through short food supply chains (partially or totally), and 20% had on-farm processing activities. Table 2, below, shows the data for these variables at the beginning (2007–2009) and at the end (2015–2017) of the period. It shows that, at the end of the period compared to the beginning, a lower share of male young farmers (and therefore a higher share of female young farmers), an increased share of farms transferred to young farmers outside the family, and an increase in farms with added value, namely specific practices (organic farming) or activities (on farm processing).

4. Setting up cost for young farmers in 2007–2017

Over the 11 years (2007–2017), in Fig. 2 below a trend can be seen in transaction price and post-transfer investment costs, which are quite variable. Transaction prices were between €59,000 and €85,000, and average annual investment costs rose from €160,000 in 2010 to over €247,000 in 2014, then declined to €190,000 in 2017. The nature of projects and cyclical effects undoubtedly influence values, as in 2009 and 2010 following the global financial crisis.

Table 3, below, presents the descriptive statistics for the 3 cost variables of interest, which are available for a useable sample of 704 farmers out of the total 841. The total cost of setting up a farm in the Puy-de-Dôme region in 2007–2017 for young farmers receiving a set-up grant was around 280,000 Euros, on average, including a transaction price of 81,000 Euros and almost 200,000 Euros of investments over the 4 years following set up. The mean value and standard deviation of the buying cost (i.e. transaction price P) are lower than the cost of investments made in the first 4 years following the set up (I). The largest

Table 3
Descriptive statistics of setting up cost in Euros for young farmers in 2007–2017 (Conway et al., 2016) (Source: DDT 63).

	Mean	Std. Deviation	No.
Transaction price P	80,913	62,898	704
Investments in the four years following set up I	198,693	159,423	704
Total cost of setting up $C = P + I$	279,606	171,489	704

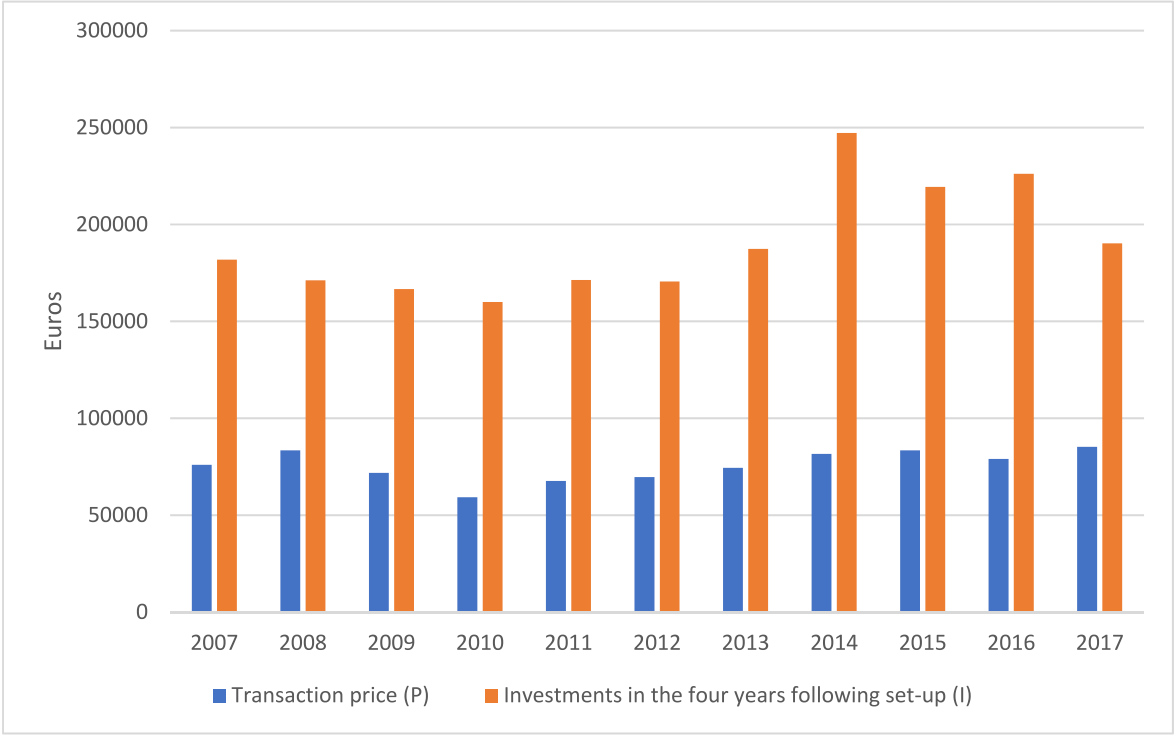


Fig. 2. Distribution of cost of setting up: Transaction price and cost of post-transfer investment - 2007–2017 (DDT63). (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

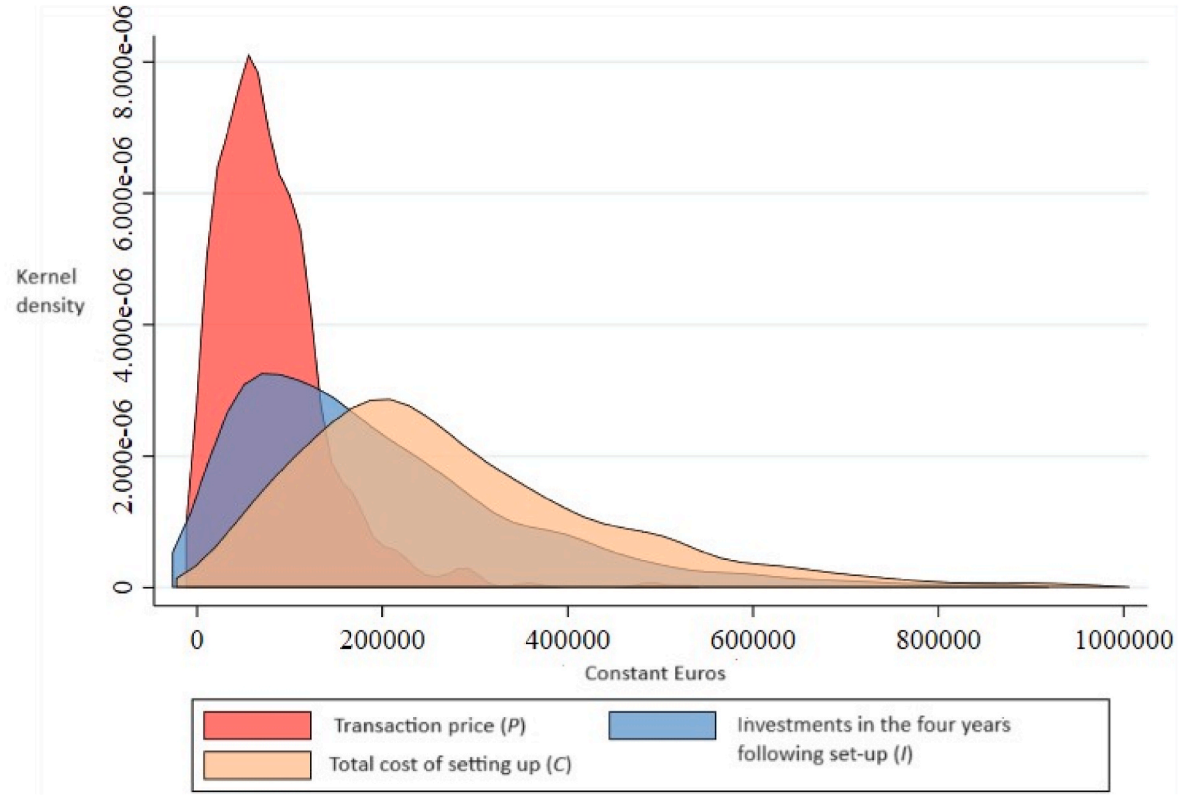


Fig. 3. Distribution of costs of setting up for young farmers in the period 2007–2017 (Conway et al., 2016) (Source: DDT 63). (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

component of the total cost of setting up in business as a young farmer (*C*) is therefore the investment (*I*) required after the transaction in order to modernise, expand or implement new activities. While such investments are of crucial importance to ensure the survival of the business, they are substantial. This is supported by Fig. 3, below, which shows a narrow peak in the distribution of farm transaction prices (*P*) centred around the mean, whereas the peak in the distribution of investments post-set up (*I*) is broader and less centred on the mean, indicating a greater standard deviation. No correlation is observed between the transaction price (*P*) and the value of subsequent investments (*I*), (correlation coefficient of 0.0941). This shows that the total cost of setting up in business for a young farmer is more dependent upon the investments made after purchase than it is upon the initial cost of buying the farm (transaction price), which tends to be lower and less variable. The projects undertaken by young farmers in the first years after purchase thus account for a larger share of the total cost of setting up than the actual purchase of the farm. While some previous studies focused on the high value of the farms transferred being an obstacle to new entrants, we show that this is not the full story. In our case study, new farmers have to bear investment costs 2.5 times as much as the farm value (or transaction price) in the 4 years following their business set up. Finding sufficient financing is therefore an important issue for transferees.

Our database provides details of the different financing options used to purchase the farm as well as to fund subsequent investments (Fig. 4). These options are of 5 types: bank loans with subsidised interest rates[2];

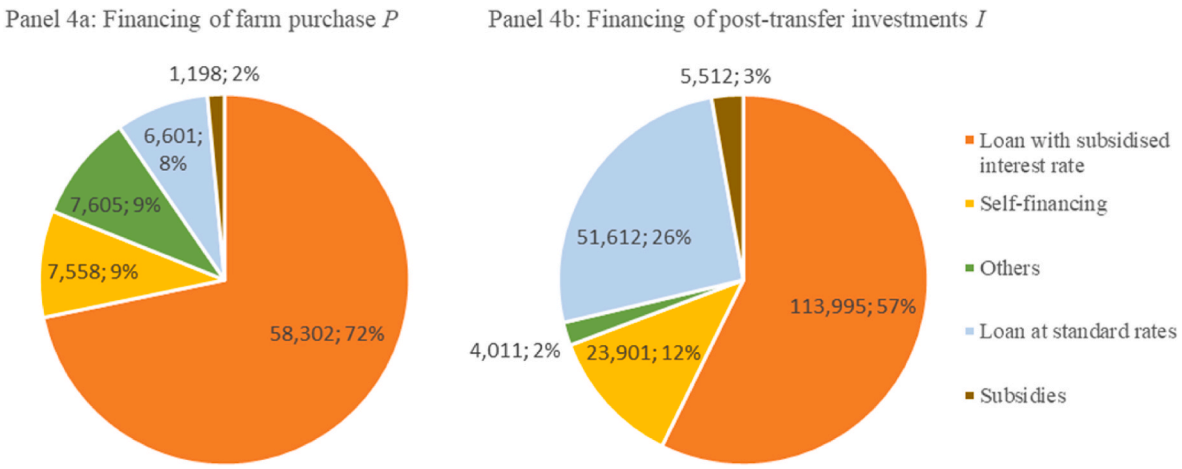


Fig. 4. Types of financing (Euros; %) of farm purchase *P* and of post-transfer investments *I* for young farmers setting up in the period 2007–2017 (Source: DDT63). (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

Table 4
Results of the estimation of the determinants of the total cost of setting [1]up (*C*).

		Ordinal logistic model		Linear model
Dependent variable: total cost of setting up (*C*)	Reference vs other mode	(1)	(2) (Cluster)	(3) (Cluster)
Young farmer gender	Female vs Male	0.564**	0.546	0.740
Young farmer age (years)		0.973*	0.974*	0.984*
Young farmer education	High school diploma attained vs Continuing education at high school level	1.331*	1.346*	1.199*
	Bachelor degree attained vs Continuing education at high school level	1.451***	1.474***	1.286***
Transaction within the family	Non-family vs Family	0.931	0.922	0.983
Farm legal status	Sole proprietorship vs other	0.570***	0.557***	0.690***
Farm type of main production	Dairy vs Beef cattle or sheep	2.320***	2.329***	1.682***
	Crop vs Beef cattle or sheep	0.588**	0.602***	0.794**
Farm UAA (class by hectares)	[52; 102[vs [0; 52[	2.153***	1.799	1.395
	[102; 152[vs [0; 52[	4.852***	4.053***	2.480***
	[152; 202[vs [0; 52[	8.065***	7.420***	3.582***
Employees on the farm	Yes vs No	3.266***	3.132***	1.819***
Organic farming	Yes vs No	0.687	0.439	0.648
Short food supply chains	Partially vs No	0.688*	0.223***	0.469**
	Totally vs No	0.243***	0.0835***	0.299***
Quality label	Yes vs No	3.018***	3.062***	2.037***
On-farm processing	Yes vs No	1.707**	1.606*	1.166
Young farmer gender × Farm UAA	Female × [52; 102[		1.071	1.115
	Female × [102; 152[		1.243	0.999
	Female × [152; 202[		0.762	0.805
Short food supply chains (SF) × Farm UAA	SF × [0; 52[		2.828**	1.769*
	SF × [52; 102[		4.152***	2.157**
	SF × [102; 152[		4.114***	2.126***
	SF × [152; 202[		3.663**	1.867**
Number of observations		759	0.149	76.99
Pseudo R-squared		759	56.95	0.382
Test of Brant (Chi^2)		759	0.152	

*, **, *** indicate $p < 0.1$, $p < 0.05$, $p < 0.01$.

bank loans at standard rates; subsidies; self-financing (including own savings, inheritance, or private loans); and other sources. Bank loans are the most widely used source of financing (80% of total financing). Loans at subsidised rates of interest account for a large majority of the financial resources were used to fund both the purchase of farms (72%, Panel 4a) and post-transfer investments (57%, Panel 4b). This is consistent with the agricultural policy in place during the period studied, since subsidised loans were available at more generous rates for new farmers setting up in mountain regions (the majority of our sample) than for those in the plains.

5. Explaining the cost of setting up

In order to explain the cost of setting up, the determinants of *C*, as well as those of *P* and *I*, were analysed using both a linear model and an ordinal logistic regression model as explained above. The hypothetical proportionality of the model was tested by applying the Brant test to all regressions. The hypothesis was confirmed for all of them, supporting our decision to use an ordered logit model rather than a generalised ordered logit model. The results of this test, as well as results from the estimations, are presented in Table 4, below, for the total cost of setting up (*C*) and in Table 5, below, for transaction price (*P*) and investments in the 4 years following setting up (*I*). Specification (1) shows the standard ordinal logistic model, while specification (2) is the standard ordinal logistic model with clustered standard errors, accounting for the fact that the cost-dependent variable may be correlated with specific groups of observations. It is worth noting that for these specifications, an odds ratio greater than 1 (lower than 1) indicates that the effect of the variable is significant (non-significant). Specification (3) is the linear regression model, also with clustered standard errors.

Table 4 shows that the farmer's gender has a significant effect on the total cost of setting up in specification (1), with the cost of setting-up for women being significantly lower (odds ratio lower than 1). When interacting the young farmer gender and the farm UAA in specifications (2) and (3), the coefficient for gender is not significant. This suggests that the effect of gender on the total cost of setting up is not specific to a farm size category. While there is no significant difference related to gender in terms of the total cost of setting up, 3 specifications point to a negative and small effect of age on the total cost of setting up. The older the young farmer is, the lower the cost of setting-up (odds ratio lower than 1). Level of education has a positive and significant effect on the total cost of setting up, with the magnitude of the coefficients increasing with the level of education. Young people with higher levels of education may be more likely to manage larger, more complex farms and, consequently, to set up more expensive farms both in terms of purchase price and necessary investments. Contrary to the general view that a transferred farm within the family may lower the total cost of setting up, transaction within the family has no significant effect on this cost. This is in line with recent sociological findings (Chiswell, 2016) indicating that successors from outside the family are being increasingly considered as own children following a period of trust building between the transferor and the extra-family transferee (Jacques-Jouvenot et al., 2021). In contrast, the variable relating to legal status shows that sole proprietorship farm has a negative and significant effect on total costs of setting up compared to farm with corporate status (as the odd ratio is lower than 1).

The type of production has a significant influence on the total cost of setting up. More precisely, dairy farms have a significantly higher cost of setting up than beef and sheep farms, while arable farms have a significantly lower cost. This can be explained by the fact that the larger corporate or partnership farms, specialised in beef cattle or dairy production, are more frequently found in Puy-de-Dôme and are more capital-intensive than sole proprietorship farms, which are smaller and more oriented towards arable production. The UAA size has a positive and significant effect on the total cost of setting up (odds ratio greater than 1). This effect is even stronger as the UAA increases. The variable proxying whether employees are present on the farm also has a significant and positive effect on the total cost of setting up. This suggests the existence of a managerial value linked to the employees' skills and specialisation, which can increase value-added. This may be integrated into the value of the farm transferred, which is one of the 2 components of the total cost of setting up, *C*. Finally, the variables related to production practices show heterogeneous results. Organic farming has no significant effect despite the fact that organic land may command a higher price than land used for conventional farming (thus increasing *P*). Selling through short food supply chains has a significant and negative effect on the total cost of setting up (odds ratio lower than 1). This effect

Table 5
Results of the estimation of the determinants of the transaction price (*P*) and investments in the 4 years following setting up (*I*), with ordinal logistic regression.

Dependent variable					
	Reference vs other mode	Transaction price (*P*)		Investments in the four years following setting up (*I*)	
		(1)	(2) (Cluster)	(1)	(2) (Cluster)
Young farmer gender	Female vs Male	0.663	0.797	0.596**	0.680
Young farmer age (years)			0.976	0.992	0.993
Young farmer education	High school diploma attained vs Continuing education at high school level	1.073	1.068	1.310***	1.320**
	Bachelor degree attained vs Continuing education at high school level	1.300	1.302	1.352**	1.369**
Transaction within the family	Non-family vs Family	0.945	0.933	0.763**	0.767**
Farm legal status	Sole proprietorship vs Other	1.446**	1.406**	0.463***	0.445***
Farm type of main production	Dairy vs Beef cattle or sheep	1.022	1.026	2.384***	2.418***
	Crop vs Beef cattle or sheep	0.792	0.813	0.604***	0.605***
Farm UAA (class by hectares)	[52; 102[vs [0; 52[	4.267***	3.688***	1.076	1.285
	[102; 152[vs [0; 52[	6.191***	5.853***	2.191***	2.312**
	[152; 202[vs [0; 52[	8.129***	7.455***	3.469***	3.992***
Employees on the farm	Yes vs No	1.756**	1.628*	2.106***	2.064***
Organic farming	Yes vs No	0.854	0.771	0.665	0.384*
Short food supply chains	Partially vs No	0.849	0.447**	0.747	0.272**
	Totally vs No	0.650	0.394***	0.409***	0.153***
Quality label	Yes vs No	1.623***	1.662***	2.471***	2.613***
On-farm processing	Yes vs No	0.796	0.774	1.666**	1.567*
Young farmer gender × Farm UAA	Female × [52; 102[		1.025		0.641
	Female × [102; 152[		0.683		1.072
	Female × [152; 202[		0.537		0.766
Short food supply chains (SF) × Farm UAA	SF × [0; 52[		1.363		3.811***
	SF × [52; 102[		2.049*		2.854**
	SF × [102; 152[		1.958***		3.803***
	SF × [152; 202[		2.608**		3.187**
Number of observations		770	770	770	770
Pseudo R-squared		0.068	0.071	0.119	0.122
Test of Brant (Chi^2)		54.73	64.75	79.21	91.23

*, **, *** indicate $p < 0.1$, $p < 0.05$, $p < 0.01$.

is more significant in the case where a farm sells wholly through short supply chains rather than partially. However, short food supply chains interacted with UAA removes the size effect of farms adopting short food supply chains which, on average, are smaller than the others. The addition of the variable crossing size and short supply chain increases the magnitude of the negative coefficient of short supply chain. Quality labels have a strong positive and significant effect on the total cost of setting up. This suggests that they are integrated into the value of the farm and thus the transaction price, or that some investments from the young farmer are necessary to continue producing under the labels. Finally, on-farm processing has a positive significant effect on the total cost of setting up with the ordinal logistic models, suggesting higher revenues increasing profitability and thus farm value.

We now estimate with ordinal logistic regression (Table 5) the effect of the same explanatory variables on the 2 components of the total cost of setting up *C*. Regarding the transaction price *P*, the farm UAA has a positive and significant effect on it (odds ratio greater than 1), similar to the effect on the total cost of setting up *C*. The farm legal status of sole proprietorship also has a positive effect on the farm transaction price, but an opposite effect on the total cost of setting up *C*. This suggests that it is more difficult and more expensive to take over a farm as an individual farmer, whereas a corporate farm takeover allows a candidate to become a farmer by only having to buy part of the share capital (shareholders' capital). The young farmer, as a new farm corporation's shareholder, only has to invest in part of the share capital to access and manage the farm business, whereas he/she must finance the entire share capital individually if he/she prefers to take over the farm as an individual. The lower transaction price for taking over a farm in a corporation may also allow for more investment in the years following takeover, unlike for young individual farmers who already have to absorb the purchase of the farm on their own and therefore may not be able to invest in the following years. Producing under a quality label and having employees have a positive effect on the transaction price, suggesting that these aspects are integrated in the value of the farm when setting the transaction price, because they are the source of value-added creation.

As regards investments post-setting up, *I*, most of the effects (Table 5, below) are similar to those for the total cost of setting up *C* (Table 4); that is, for education, legal status, UAA, employees and variables describing practices. This is consistent with the fact that investments make up most of the total cost of setting up. We note that investment in the post-set up period is significantly higher when the set-up is carried out within a family context than in a non-family one.

6. Conclusion

This article focuses on understanding the cost that transferees incur in order to take control of a farm business, and the determinants of this cost. We investigated the total cost of setting up in business for young farmers (aged under 40) in the French region of Puy-de-Dôme during 2007–2017, using an original database of administrative records for young farmer grants. Such costs are not limited to the price paid for the farm during the transaction, but span a longer period due to the investments necessary in the first few years following the takeover. Our results indicate that, during this post-purchase period, investments are substantial and account for more than twice the farm transaction price in our sample: on average, the farm transaction price is around 80,000

[2] Loans with subsidised interest rates are loans to which interest is applied at a rate below the market average. They were part of a policy measure to support new farmers under the second pillar of the CAP, and came to an end in 2017.

Euros, whereas the investment required in the first 4 years is an average of almost 200,000 Euros. The total cost of setting up a farm is therefore close to 280,000 Euros. Our investigation of the determinants of this total cost shows that it is influenced by the young farmer's gender, the farm size and legal status, and the type of agricultural production. In summary, the typical profile of a young farmer incurring high setting-up cost is a young man with a high school diploma, setting up in a corporation or partnership farm, in a family context, in livestock production, on a large farm, and producing with a quality label.

On-farm processing and producing with a quality label have positive effects on the total cost of setting up, which can be explained by the nature of these activities: they are expected to generate a higher added value and guarantee a certain income once the farm has been taken over. This is supported by the fact that producing under a quality label positively influences both cost components, namely transaction price and investments. This effect on transaction price shows that a quality label is an integral part of what is considered to be the value of a farm by both parties in the transaction. On-farm processing does not influence the transaction price but does influence the post-purchase investments, suggesting that the latter are needed to modernise or expand the facilities. By contrast, selling through short food supply chains has a negative effect on total setting up cost. It is therefore important to offer longer-term support to young farmers, and to adapt the support to the specificities of the farms.

Our data show changes in the profiles of young entrants, something that was confirmed by the experts we interviewed about our results. Among young entrants between 2007 and 2017, the shares of women and non-family farmers have increased, as have the shares of farms with organic farming practices and on-farm processing. This suggests the development of a strategy of differentiation of activities within the new generation of farmers.

Our study concentrated on the farmer's and farm's characteristics available in our data. However, the cost of taking over an agricultural business is a necessary but not sufficient parameter to understand the willingness of potential successors to take over the business. Other factors such as the income gap, employment rates or proximity to an urban area effect inheritance or purchase intentions (Lobley and Baker, 2016; Teagasc, 2014; Cavicchioli et al., 2018). Further analyses should also focus on new entrants aged 40 or over who are not eligible for a young farmer grant but who are becoming more frequent.

CRediT authorship contribution statement

Philippe Jeanneaux: Writing – review & editing, Writing – original draft, Supervision, Methodology, Formal analysis, Data curation, Conceptualization. **Eliot Wendling:** Writing – original draft, Formal analysis, Conceptualization. **Yann Desjeux:** Writing – review & editing, Methodology, Conceptualization. **Geoffroy Enjolras:** Writing – review & editing, Conceptualization. **Laure Latruffe:** Writing – original draft, Methodology, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgements

The authors are grateful for financial support from the Agence Nationale de la Recherche-ANR in the framework of the research project FARM_VALUE 'Farm value and farm transfer: perspectives from economics and sociology' (ANR-15-CE36-0006). They thank the Directions Départementales des Territoires (DDT) of the French region Puy-de-Dôme for providing administrative records of young farmers intending to set up in a farming business.

Data availability

The data that has been used is confidential.

References

Agreste, 2022. Memento 2022 Auvergne-Rhône-Alpes. DRAAF AuRA, SRISET, p. 40.
Alston, J., Pardey, P., 2016. Antipodean agricultural and resource economics at 60: agricultural innovation. Aust. J. Agric. Resour. Econ. 60 (4), 554–568. https://doi.org/10.1111/1467-8489.12162.
Bertoni, D., Cavicchioli, D., Latruffe, L., 2023. Impact of business transfer on economic performance: the case of Italian family farms. Int. J. Enterpren. Small Bus. 48 (2), 186–212. https://doi.org/10.1504/IJESB.2021.10040377.
Bourdieu, J., Coeuré, B., Sédillot, B., 1997. Investissement, incertitude et irréversibilité. Quelques développements récents de la théorie de l'investissement. Rev. Econ. Paris 48 (1), 23–53. https://doi.org/10.3406/reco.1997.409862.
Calus, M., Van Huylenbroeck, G., Van Lierde, D., 2008. The relationship between farm succession and farm assets on Belgian farms. Sociol. Rural. 48 (1), 38–56. https://doi.org/10.1111/j.1467-9523.2008.00448.x.
Cavicchioli, D., Bertoni, D., Pretolani, R., 2018. Farm succession at a crossroads: the interaction among farm characteristics, labour market conditions, and gender and birth order effects. J. Rural Stud. 61, 73–83. https://doi.org/10.1016/j.jrurstud.2018.06.002.
Chiswell, H.M., 2016. From generation to generation: changing dimensions of intergenerational farm transfer. Sociol. Rural. 58, 104–125. https://doi.org/10.1111/soru.12138.
Conway, S.F., McDonagh, J., Farrell, M., Kinsella, A., 2016. Cease agricultural activity forever? Underestimating the importance of symbolic capital. J. Rural Stud. 44, 164–176. https://doi.org/10.1016/j.jrurstud.2016.01.016.
Coopmans, I., Dessein, J., Accatino, F., Antonioli, F., Bertolozzi-Caredio, D., Gavrilescu, C., Gradziuk, P., Manevska-Tasevska, G., Meuwissen, M., Peneva, M., Petitt, A., Urquhart, J., Wauters, E., 2021. Understanding farm generational renewal and its influencing factors in Europe. J. Rural Stud. 86, 398–409. https://doi.org/10.1016/j.jrurstud.2021.06.023.
Cour des comptes, 2023. La politique d'installation des nouveaux agriculteurs et de transmissions des exploitations agricoles. Communication à la commission des finances du Sénat, p. 188. Avril 2023.
Damodaran, A., 2005. Valuation approaches and metrics: a survey of the theory and evidence. Found. Trends® Finance 1 (8), 693–784. https://doi.org/10.1561/0500000013.
European Commission, 2021. *EVALUATION of the Impact of the CAP on Generational Renewal, Local Development and Jobs in Rural Areas*. Commission Staff Working Document, SWD (2021) 79. Fi-Compass. 2020. Financial Needs in the Agriculture and Agri-Food Sectors in the European Union, Summary Report. Europe Investment Bank, European Commission, p. 94.
Gale, H.F., 1994. Longitudinal analysis of farm size over the farmer's life cycle. Appl. Econ. Perspect. Pol. 16 (1), 113–123. https://doi.org/10.2307/1349526.
Garcia, C., Pérez, J., López, M., Salmerón, R., 2017. A generalized method for valuing agricultural farms under uncertainty. Land Use Pol. 65, 121–127. https://doi.org/10.1016/j.landusepol.2017.04.008.
Gasson, R., 1993. The Farm Family Business. CAB International, Wallingford, Oxon, UK, p. 290.
Gaté, R., Laure Latruffe, L., 2016. Difficultés rencontrées lors de la transmission d'exploitations agricoles : le cas de la Bretagne. Écon. Rurale 351, 5–24. https://doi.org/10.4000/economierurale.4792.
Glauben, T., Petrick, M., Tietje, H., Weiss, C., 2009. Probability and timing of succession or closure in family firms: a switching regression analysis of farm households in Germany. Appl. Econ. 41 (1), 45–54. https://doi.org/10.1080/00036840601131722.
Gloy, B.A., Hyde, J., LaDue, E.L., 2002. Dairy farm management and long-term farm financial performance. Agric. Resour. Econ. Rev. 31, 233–247. https://doi.org/10.1017/S1068280500004032.
Jacques-Jouvenot, D., Schepens, F., 2007. Transmettre et reprendre une entreprise : de l'Homo œconomicus à l'Homo memor. Rev. Du. MAUSS 29, 377–391. https://doi.org/10.3917/rdm.029.0377.
Jacques-Jouvenot, D., Sposito-Tourier, M., Casagrande, C., 2021. 'Because it is worth it!' Assessment of a farm and its successor (Franche-Comté, France). Études Rural. 208, 59–76. https://doi.org/10.4000/etudesrurales.27899.
Jeanneaux, P., Desjeux, Y., Enjolras, G., Latruffe, L., 2022. Farm valuation: a comparison of methods for French farms. Agribusiness: Int. J. 38 (4), 786–809. https://doi.org/10.1002/agr.21752.
Kerbler, B., 2008. The influence of factors of the socio-geographical structure of mountain farms in Slovenia upon farm succession statuses and decisions. Acta Geograph. Sloven. 48 (2), 277–303, 10.3986.AGS48203.
Kryszak, Ł., Guth, M., Czyżewski, B., 2021. Determinants of farm profitability in the EU regions. Does farm size matter? Agri. Econ.Czech 67, 90–100. https://doi.org/10.17221/415/2020-AGRICECON.
Laband, D., Lentz, B., 1983. Occupational inheritance in agriculture. Am. J. Agric. Econ. 65 (2), 311–314. https://doi.org/10.2307/1240880.
Latruffe, L., Desjeux, Y., Enjolras, G., Jeanneaux, P., 2023. Methods for farm valuation. EuroChoices 22 (2), 36–37. https://doi.org/10.1111/1746-692X.12392.
Lobley, M., Baker, J.R., 2016. Succession and retirement in family farm businesses. In: Lobley, M., Baker, J., Whitehead, I. (Eds.), Keeping it in the Family. Routledge, pp. 1–20.

MAAF-DGPAT, 2015. Instruction des demandes d'aides à l'installation, relevant de la programmation 2014-2020 et déposés à partir du 1er janvier 2015. Instruction Technique DGPAAT/SDEA/2015-330, p. 73, 09/04/2015.
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 Socioecon. Agr. 12, 109–138.
Micheels, E.T., 2014. Experience and learning in beef production: results from a cluster analysis. Int. J. Agri. Manag. 3 (3), 154–163. https://doi.org/10.22004/ag.econ.236904.
Nilsson, P., Wixe, S., 2022. Assessing long-term effects of CAP investment support on indicators of farm performance. Eur. Rev. Agric. Econ. 49 (4), 760–795. https://doi.org/10.1093/erae/jbab038.
Pesquin, C., Kimhi, A., Kislev, Y., 1999. Old age security and inter-generational transfer of family farms. Eur. Rev. Agric. Econ. 26 (1), 19–37. https://doi.org/10.1093/erae/26.1.19.
Porter, M.E., 1985. The Competitive Advantage: Creating and Sustaining Superior Performance. Free Press, New York.
Rasmussen, S., 2010. Scale efficiency in Danish agriculture: an input distance–function approach. Eur. Rev. Agric. Econ. 37 (3), 335–367. https://doi.org/10.1093/erae/jbq023.
Ratinger, T., Medonos, T., Hruška, M., 2013. An assessment of the differentiated effects of the in- vestment support to agricultural modernisation: the case of the Czech Republic. Agris on-line Papers in Economics and Informatics. https://doi.org/10.22004/ag.econ.162256.
Skevas, T., Skevas, I., Cabrera, V.E., 2021. Examining the relationship between social inefficiency and financial performance. Evidence from Wisconsin dairy farms. Sustainability 13, 3635. https://doi.org/10.3390/su13073635.
Strutt & Parker, 2024. English Estates & Farmland Market Review- Winter 2023/2024, vol. 8p. BNP Paribas Group.
Teagasc, 2014. *A Guide to Transferring the Family Farm*. Carlow, Ireland. December. 68pp.
Tey, Y.S., Brindal, M., 2015. Factors influencing farm profitability. Sustain. Agri. Rev. 15, 235–255.
van der Meulen, H.A.B., Dolman, M.A., Jager, J.H., Venema, G.S., 2014. The impact of farm size on sustainability of Dutch dairy farms. Int. J. Agri. Manag. 3 (2), 119, 123.0.5836/ijam/2014-02-07.
Viaggi, D., Bartolini, F., Raggi, M., Sardonini, L., Sammeth, F., Gomez y Paloma, S., 2011. Farm Investment Behaviour under the CAP Reform Process. Publications Office of the European Union, Luxembourg.
Wan, J., Li, R., Wang, W., Liu, Z., Chen, B., 2016. Income diversification: a strategy for rural region risk management. Sustainability 8, 1064. https://doi.org/10.3390/su8101064.
Wheeler, S., Bjornlund, H., Zuo, A., Edwards, J., 2012. Handing down the farm? The increasing uncertainty of irrigated farm succession in Australia. J. Rural Stud. 28 (3), 266–275. https://doi.org/10.1016/j.jrurstud.2012.04.001.
Wright, W., Brown, P., 2019. Succession and investment in New Zealand farming. N. Z. Econ. Pap. 53 (2), 203–214. https://doi.org/10.1080/00779954.2017.1419501.
Zhengfei, A., Oude Lansink, A., 2006. The source of productivity growth in Dutch agriculture: a perspective from finance. Am. J. Agric. Econ. 88 (3), 644–656. https://doi.org/10.1111/j.1467-8276.2006.00885.x.