An appraisal of family farm succession studies: a review

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The transfer of the farm business from the older (parental) to the younger generation is a fundamental aspect of farm continuation and rural development. Although common consensus about importance of farm transfer exists, the scientific analyses of farm succession started only four decades ago as the earliest studies bear the date from the sixties of the former century and ahead (see i.e. Nalson 1968, Boehlje and Eisgruber 1972, Commins and Kelleher 1973). This paper offers a review of international family farm succession studies from different countries and for the period of the last 20 years. Two scientific approaches, i.e. classical statistics methods and econometric methods are common for all revised publications. At the end the differences in the use of both methodological approaches are briefly discussed.

Key words: family farm, farm succession, methodological approaches

INTRODUCTION

Scientific research on family farms succession have become more and more important in the present time as many farms, especially in transition countries, face big structural changes (Potter and Lobley 1996, Bohak and Borec 2008).

According to Fennell (1981), family farm succession is a process occurring over long or short time, during which a farm family plans a transfer of knowledge, labour, skills, management, control and ownership of the farm business from the retiring generation to the next generation. It involves the creation, preservation and finally the ultimate transfer of the farm business assets in order to achieve personal, family and business goals (Glauben et al. 2004a). Each family farm business is unique and there is no uniform instructions how to accomplish succession. It is important to understand that many different factors affect the process; the most important are structural characteristics of the farm and farm family (Kimhi and Nachlieli 2001, Corsi 2004, Kerbler 2007). Which factors are really significant and how do they work is the subject of interest of many international studies.

The following paper analyses farm succession studies from different countries in the period of the last 20 years. There are many different scientific methods used to process the survey data or to describe the process of farm succession. This paper presents studies investigating problems in the family farm succession process, where two general groups of scientific methods are applied: 1.) classical statistics methods and 2.) econometric methods

The literature on this topic was mainly published by scientists involved in rural sociology. Indeed, agricultural economists mostly used to tackle farm succession from the fiscal point of view. Nowadays, agricultural economists focus more on different factors affecting succession while rural sociologists try to shed light on different practises and patterns of the process of farm succession, farm transfer and farmers` retirement.

PROBLEMS IN FAMILY FARM SUCCESSION PROCESS DISENTANGLED WITH THE USE OF CLASSICAL STATISTICS

In order to find out how the elderly farmers manage their land in comparison to their younger counterparts and to analyse differences between farms with and farms without successor, the survey from 165 family farms from England and Wales was conducted (Potter and Lobley 1992). The used methodological tools were descriptive statistics followed by t-test for checking the differences between both groups of farms and Chi-square test for testing the associations between different variables. The results showed that the most important difference between farmers with and farmers without successor was dependent on the so called "successor effect": the presence of successor on the family farm may well operate throughout a whole farmer's career as elderly farmers without successors are less likely to be active in their business decision making compared to their peers with successors (Potter and Lobley 1992).

The problems in intergenerational transfer of managerial control in the farm-family business in England, France and Canada were researched by the use of descriptive statistics in the study of Errington (1998). The results were revealing some important differences between the countries as well as some underlying similarities regarding retirement decisions of the farmers, content and timing of vocational education and training, succession ladder and sharing of the responsibility between farmers and their successor (Errington 1998).

The gender inequalities might be reproduced through farm succession process as it has often been stressed that the discrimination suffered by girls in family farm succession process is rooted in tradition, while (in particular first-born) boys are favoured in the inheritance of property (Gidarakou et al. 2000). The field study from Greece was carried out through

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personal interviews with the family farm heads and their children. The results have been confirmed that there is a marked discrepancy between the two genders in the process of their socialization and incorporation into the professional arenas (Gidarakou et al. 2000).

Successful transfer of all managerial responsibilities must be planned and gradual (Errington 1993/94) and the value of TFA (total farm assets) may be a tool to identify farms with a higher probability of successful transfer (Calus et al. 2008). For this purpose, the survey from 2008 included a 15-years panel data of 713 farms from the Belgian FADN was performed. The relations between total farm assets and different succession situations on farms were tested by Pearsons χ^2 while the F-value was counted up to analyse the variance of the difference in total farm assets between the different succession intentions and farm types. The empirical results have showed that lower total farm assets often result in farm discontinuation (Calus et al. 2008).

In the most cases the future successor is the child of the farmer, what seems to be a rather specific feature of farming (Blanc and Perrier-Cornet 1993).The Slovene family farm research on number of children on farms (Barbič 1993) was conducted with a view to enlighten the reasons for unrealised wishes on children and shortenings and/or priorities of rural youth and thus about the reasons for children leaving the farms. The descriptive statistics and the factor analysis reveal that young people are staying on the home farm not only be-

cause "there is no other chance" but also the emotional attachment to their parents and home farm play an important role while the farm work afford them much pleasure (Barbič 1993).

An important issue regarding the investigating family farm succession consideration is FARMTRANSFERS Project, which is seeking to confirm the elements of farm succession plans, to compare patterns of succession in the countries, states, provinces and/or territories and to create a data archive that is available to research collaborators (Giraud and Baker 2007). Participation in this research project require the replication of the Farm Succession Survey authored by Errington (1998) and using the standardized questionnaire which may be translated into different languages appropriate to a specific country, state or province.

The most used methods to analyse the gathered FARM-TRANSFER Project data are classical statistics tools, e. g. descriptive statistics, Wilcoxon-test, Mann-Whitney-test, t-test, χ^2-test or Fischer's exact test. There were performed many studies in the framework of this project through the whole world and the analyses were focused mostly on differences in succession plans and farm family characteristics (Glauben et al. 2004a), on common succession plans (Giraud and Baker 2007) and on the factors which may lead either to the farm transfer or to the farm exit (Rossier and Wyss 2006).

In the next table the literature on family farm succession process regarding used method, i.e. classical statistics methods are presented (Table 1).

Table 1: Overview of family farm succession studies using classical statistics methods

Study	Data collection methods and samples	Data processing methods	Objectives	Type of publication
1. Potter and Lobley (1992)	165 farms from England and Wales in the year 1990	descriptive statistics; differences were tested using the t-test, two tailed	to examine the land use and the land management decisions made by elderly farmers, comparing them with their younger counterparts	article in the journal
2. Errington (1998)	questionnaire, 1269 farmers from England (response rate 64,1%); 5231 from France (37.8%) and 2000 from two Canadian provinces (Ontario:28,6%; Quebec 35,5%)	simple descriptive statistics in tables	to reveal some important differences between the countries as well as some underlying similarities regarding retirement and succession decisions	article in the journal
3. Gidarakou et al. (2000)	personal interviews with 110 farmers and their children, living on farm (sons and daughters, 18-35 years) from central Greece	simple descriptive statistics in tables	to asses the way gender inequalities, already existing in rural comunities and farm households, are reproduced through farm succession process	article in the journal
4. Calus at al. (2008)	Belgian FADN, a subsample of farmer aged 45 years or more. 15-years observation period (1989-2003), 713 farms	descriptive statistics, relations tested using Pearson χ2 coefficient, F-value for analysis of variance	to explore total farm assets as a potential tool to identify farms with a higher probability of transfer	article in the journal
SLOVENE AUTHOR				
5. Barbič (1993)	questionnaire, part of the study "Family farm" in the year 1991, 780 respondents from Slovenia	descriptive statistics in tables and graphs, factor analysis, differences tested using Pearson's coefficient	to investigate the number of children and the number of desired children. About the children's reasons for staying on/leaving the farm	article in the journal
FARMTRANSFERS PROJECT PUBLICATIONS				
6. Glauben et al. (2004a)	FARMTRANSFERS questionnaire, 348 farm operators from Northern Germany (Schleswig-Holstein), 278 farm operators from Austria	t-test, Wilcoxon-test, Mann-Whitney-test, χ2 –test or Fischers´ exact test.	to analyse farm succession patterns in both regions	working paper
7. Rossier and Wyss (2006)	FARMTRANSFERS questionnaire, 776 farms from Switzerland, farm operators aged 40 years or more	descriptive statistics	to analyze the influencing factors and processes that may lead either to the handover of the farm or to the exit from agriculture	selected paper for the EAAE Conference
8. Giraud and Baker (2007)	FARMTRANSFERS questionnaire in autumn, 106 respondents from California	descriptive statistics	to present an overview of retirements issues farmers must face	report

PROBLEMS IN FAMILY FARM SUCCESSION PROCESS DISENTANGLED WITH THE USE OF ECONOMETRIC METHODS

When is the timing of farm transferral from parent to child optimal? What are the factors affecting family farm transfer and succession process? Those questions were most often answered using econometric methods, i.e. application of different econometric models.

Transferring time is decreasing with parent's age and child's schooling and increasing with parents' experiences (Kimhi 1994). For modelling and evaluation the interrelationship between the time of succession and other factors the equations of transfer time and child's education was derived and censored regression model using two-stage method was estimated by applying the data from 1971 and 1981 censuses of agriculture in Israel (Kimhi 1994).

In order to explain the farmers´ tendency to exit from farming Canada and Israel, probit model was estimated in the study of Kimhi and Bollman (1999). In both countries, exit probability decreases with the amount of the off-farm work and increases with the age of farm operators. The major difference between both countries lies in the farm size, which decreases exit probability in Canada but increases in Israel (Kimhi and Bollman 1999).

The differences between family and non-family succession in the Upper-Austrian farm sector were examined empirically from a panel of more than 42 000 farms from three years, 1980, 1985 and 1990. The results of multinomial logit model explained the role of many factors, i. e. personal characteristics of farm holder, on-farm diversification and off-farm employment status in the process of succession or farm exit (Stiglbauer and Weiss 2000).

Using a binary-choice analysis, the likelihood of intra-family intergenerational succession on Israeli family farms was studying (Kimhi and Nachlieli 2001). Two different definition of succession was compared, one based on an official declared successor and the other, which is more operational, based on the existence of an adult child working on the farm together with parents. Both definitions were tested using probit and SNP (Semi Non Parametric) model each. Data were collected especially for this research during the years 1994 and 1995 in nine different Israeli villages. The probability of having a successor rises with the age of the farm head, his/her level of schooling and the age of the oldest child (Kimhi and Nachlieli 2001).

It is important to study the conditions under which a farm is transferred from parents to child (Gasson and Errington 1993, Gasson et al. 1988, Kovačič 1996). To asses which are those determinants (e.g. age and education level of parents and children and farm size and type) a multinomial logit model was derived and its results suggested that specific knowledge (specification on the farm) favour farm succession within the household (Corsi 2004).

The analysis of intergenerational succession in Upper Austria is based on the survey of 1650 farm households (Glauben et al. 2004b). Three aspects of succession were studied: the probability of farm succession, the likelihood of having a declared successor and the timing of succession. The results of econometric analysis prove that farm characteristics significantly influence succession considerations to the extent that they affect the value of the farm for the potential successor (Glauben et al. 2004b).

The retirement decisions of individuals are strongly influenced by economic incentives and farm and family characteristics while expected pension particularly advances farm transfer (Väre 2006). In order to analyse the timing of early retirement decisions of farming couples, it was formed a duration model and the panel of 1993-1998 data consisted of a sample of 963 Finnish farms were applied (Väre 2006).

Multinomial logit model in the paper of Hennessy and Rehman (2007) was helping to identify the factors that affect the occupational choice. The model was applied to Irish FADN data on 1200 farms in order to examine the farm, economic and personal characteristics that influence a nominated heir's decision to enter farming as opposed to some non-farming occupation. Then the interdependence between education variable and occupational choices is tested using a bivariate probit model. The results uncover significant negative relationship between higher education and the choice of full-time farming as an occupation.

To determine the impact of farm location on family farm succession, two econometric models were developed in the study of Aldanondo Ochoa et al. (2007) and estimated by data which were drawn from a 1998 farm household survey. The probit and random parameter ordered probit model suggested that farm location has a significant influence on the successful farm hand over as the distance from the local urban centre has a negative effect on the succession.

In Slovene scientific space, relationships between succession on mountain farms in Slovenia and their socio-geographical structure were investigated (Kerbler 2007). Bivariate probit model was estimated in order to find out how the succession status and decisions on farms are influenced by the factors of the socio-geographical structure of mountain farms while the influence of the same factors on timing of succession was explained by the use of tobit model. In June 2005 the survey was mailed to 3000 Slovene mountain farms with the farm operators aged 45 years and over. The final sample included 789 mountain farms. The results suggested that one fifth of the Slovene mountain farms will remain uncultivated or the farm areas will be leased or abandoned after the death of present farm operators (Kerbler 2007).

Table 2 gives a review of different econometric methods used in surveys and the main characteristics of presented surveys on family farm transfer.

Table 2: **Overview of family farm succession studies using econometric methods**

Study	Data collection methods and samples	Data processing methods	Objectives	Type of publication
1. Kimhi (1994)	1971 and 1981 censuses of agriculture in Israel, final number of the farms: 10660	censored regression model	to derive equations of transfer time and child's education	article in the journal
2. Kimhi and Bollman (1999)	panel data set from agricultural censuses in Canada (1966 and 1971) and Israel (1971 and 1981). 24288 farms from Canada, 20122 farms from Israel	probit model, maximisation the log-likelihood function for each country separately	to compare time patterns of exit decisions among farm operators in Canada and Israel, using longitudinal data sets	article in the journal
3. Stiglbauer and Weiss (2000)	1980, 1985, 1990 agricultural censuses. 42405 farms in Upper-Austria	multinomial logit model	to analyse the succession decision (the transfer of legal ownership) empirically	article in the journal
4. Kimhi and Nachlieli (2001)	data collected during 1994-1995 in nine villages, throughout the Israel. 127 farms	probit model, SNP model	to study the likelihood of intra-family intergenerational succession on Israeli family farms	article in the journal
5. Corsi (2004)	Italian agricultural census (2000). 8622 farms	multinomial logit model	to explore the conditions under which a farm household can transmit the farm management within the household itself.	working paper
6. Glauben et al. (2004b)	questionnaire, 1650 farm households in Upper Austria, 1993. Farmers aged 45 or more	bivariate probit model, tobit model (timing of succession)	examining household and farm characteristics that could affect farm succession	article in the journal
7. Väre (2006)	963 farms in Finland, panel data 1993-1998	duration model	to analyse the timing of early retirement decisions of couples using duration analysis and different exit channels	article in the journal
8. Henessy and Rehman (2007)	FADN, additional farm survey in 2002, 1200 respondents from Ireland	multinomial logit model, bivariate probit model	to identify the factors (i.e. farm, economic and personal) that affect the occupational choice and to examine the interdependence between education and occupational choice	article in the journal
9. Aldanondo Ochoa et al. (2007)	data from a 1998 farm household survey in the western part of Estella County (Spain), 61 farms	probit model and random parameter ordered probit model	to study the impact of farm location on family farm succession	article in the journal
SLOVENE AUTHOR				
10. Kerbler (2007)	questionnaire, 789 mountain farms, farm operator aged 45 or more	probit model, tobit model	to study relationship between succession on mountain farms in Slovenia and their socio-geographical structure	PhD thesis

DISCUSSION AND CONCLUSIONS

Investigating family farm succession process is the subject which allows use of different data sources (i. e. data gathered by interviews, questionnaires, data from agricultural and other censuses) and application of different statistical methods to process these data. The topic is not so generally explored in the existing literature since scientists only in the last thirty years (the earliest studies are from the year 1968 and ahead, see i.e. Nalson 1968, Boehlje and Eisgruber 1972, Commins and Kelleher 1973) have realised that the process of succession has a considerable impact on the agriculture and is also important for agricultural policy making.

This paper has been exploring the existing literature about family farm succession in the last 20 years. The main division of chapters is connected with the scientific methodology. In this article two main ways of data analysing are recognized: classical statistics and econometric methods.

Authors using classical statistics mostly describe differences between farms with successor and farms without defined successor, analyse succession process and its influencing factors or try to model a typology of farmers and successors. The main statistical tool used in this type of publications is basic descriptive statistics.

On the other side, different econometric models have been used, i.e. probit, tobit, multinomial and log models in order to determine the factors affecting the succession process to count up the likelihood of having a successor or to retire. Scientists apply those methods also when they want to answer the questions about optimal timing of farm transferral from parent to child, about the choice of successor and about the key succession considerations.

In our opinion, we could expect more studies on family farm succession in the future since this issue is of vital importance for farm survival as farms without declared successor mostly decay. The process of farms disappearing could threw out a way of other events such as abandoning of farmed areas, the lost of farming tradition and the lost of employment. Therefore, it is necessary to study the factors that may influence the succession status on the farm and to acquaint agricultural policy makers with those results in order to plan new policy measures or to assess the validity of the old ones.

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