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DOI:
10.57938/d429aa56-ed30-43e7-ba9c-632c853d465b

Published: 01/01/2006

Document Version
Publisher's PDF, also known as Version of record

International Tax Coordination SFB
www.wu-wien.ac.at/sfb-itc

Discussion Paper No. 13

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The 'Shadow of Succession' - A Non-Parametric Matching Approach[1]

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Abstract:

The paper analyses the relationship between succession and firm performance. Applying a non-parametric matching approach on a panel of roughly 4,000 Austrian family firms we evaluate the impact of past succession as well as future succession plans on employment growth. Analysing succession plans, we do not find a 'shadow of succession' effect. No significant difference in employment growth is found between firms that plan to transfer the firm in the next ten years and those who do not. In contrast, past succession exerts a significant and positive employment growth effect which becomes stronger over time. Thus, our findings provide support for the existence of a positive employment shadow after a transfer, whereas the shadow of succession hypothesis has to be rejected prior to transition.

Keywords: succession, family firms, employment growth, matching, Austria

JEL classification: C14, L25

Acknowledgements: The authors acknowledge helpful comments on an earlier version of this paper from the participants of the EIASM Workshop on Family Firm Management Research in Jönköping. Financial support from the Austrian Science Fund (SFB F 020) is also gratefully acknowledged.

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[1] This paper is a revised version of an earlier working paper (SFB-ITC Discussion Paper No. 10; http://www2.wu-wien.ac.at/taxlaw/sfb/Working_Papers/workingpaper10.pdf). In the present version we apply a non-parametric matching approach to assess the link between succession and employment development.

1. Introduction

Most firms in the world are family firms.[2] In recent years, family firms have received growing attention in different fields of economics: literature on entrepreneurship focuses on the decision to enter into family businesses, labour market economists investigate the entrepreneurs' decisions to retire and, from the perspective of the corporate governance literature, family firms allow economists to study the patterns of separation of ownership and control. The focus of our investigation is on one particular aspect of family firms: the issue of family succession. The circumstances of family succession are of great importance not only for the family members directly involved but also (per definition) for the long-run survival and success of family firms. In an extensive review of the existing research Handler (1994) finds: 'researchers in the field of family business agree that succession is the most important issue that most family firms face' (p. 133).[3]

Empirical studies indicate that the importance of family firms and family succession differs between economies as well as between different sectors within an economy. By studying occupations of different family members (grandfathers, fathers and sons), Laband and Lentz (1983) find that occupational inheritance is particularly strong among farmers and to a lesser extent among other groups such as lawyers and self-employed proprietors. A large share of the existing empirical literature focuses on succession in the farm sector, little empirical work has been devoted to succession in the non-farm sector.

The purpose of this paper is to analyse succession in small and medium sized Austrian manufacturing companies of which about 90% are family businesses. More specifically, we focus on the relationship between succession and firm performance. First, we evaluate empirically whether there is a significant difference in employment growth between two groups of firms: firms where succession has taken place during the last few years and otherwise identical firms that did not experience succession. Secondly, we investigate whether future succession plans cast their shadows on firm performance even before the transfer actually takes place. This 'shadow of succession' effect was suggested by Kimhi et al. (1995) who argue that the occurrence of succession within the family in the near future might

[2] Gersick et al. (1997) report that family firms account for 65-80% of all worldwide business, and for about 40% of the Fortune 500 companies. Although many family firms are small, in aggregate they represent about half of the U.S. gross domestic product (Aronoff et al. 1997) and employ more than 80% of the work force (Neuberg and Lank, 1998).

[3] Succession is so central that Ward (1987) chooses to define family firms in terms of the potential for succession: 'we define a family business as one that will be passed on for the family's next generation to manage and control' (p. 252).

motivate entrepreneurs to invest and raise current firm size. This link between succession considerations and firm performance might become stronger the closer the event of succession comes [4]. Research questions of special interest are: Is there a significant difference in employment growth between family businesses that plan succession in the near future (or that have been transferred recently) and family businesses without any such succession event? And if so, how long is the 'shadow of succession', i.e., how many years before and after the transfer of the firm can we observe a significant difference?

Various studies in agricultural economics deal with corporate performance prior to succession (Potter and Lobley, 1992; Kimhi et al., 1995; Stiglbauer and Weiss, 2000) and following a farm transfer (Perrier-Cornet et al., 1991; Weiss, 1999; Kimhi et al., 1995). Empirical work on the consequences of succession in the non-farm sector typically compares the corporate performance of firms that were handed down to a family member to firms that were transferred to a family outsider (Smith and Amoako-Adu, 1999 and Perez-Gonzalez, 2002). Moreover, a series of empirical papers investigate the performance of family firms based on different CEO status, i.e. founder controlled, descendant controlled and family outsider controlled and hence provide some indirect evidence on the performance of firms that were handed down to a family member (Morck et al., 1998; McConaughy, 1998; Anderson and Reeb, 2003; Sraer and Thesmar, 2004). The results found lead to a number of stylized facts. First, there is rather a negative than a positive link between succession and preceding corporate performance. Expecting succession in the future, firm owners deter long term decisions and tend to invest less. Second, succession in the farm sector leads to significant increases in ensuing farm growth. Moreover, firms that appoint a family successor show significant decreases in the operating performance relative to firms that appoint unrelated CEOs. Finally, with one exemption, descendant controlled firms are found to perform worse than founder controlled firms[5].

[4] Kimhi et al. (1995) allude in their work to Griliches and Regev (1995) who analyse firm exits and find firms that will exit in the future to have significantly lower growth rates in the years before exit compared to surviving firms and call this phenomenon the "shadow of death". Recent empirical evidence on this issue is provided by Almus (2004).

[5] Referring to the above mentioned literature, Adams et al. (2003) point out that one should be cautious in drawing conclusions from the reported correlation between inherited control and performance on the management abilities of heirs. They show that performance is negatively related to the likelihood that founders retain the CEO title. Founder CEOs are observed to step down after periods of good performance. Thus, the authors conclude that 'if performance is mean reverting and founders leave at its peak, one should observe a decline in performance when founders transfer control to their heirs even when inherited control is not bad for performance' (p.17).

A clear drawback of most studies mentioned is that they only provide indirect evidence on the link between succession and performance as they are cross-sectional studies comparing the relative performance of family successors to other CEOs and not analysing the effects of successions per se. The present study pursues a different approach. Using a ten-year panel and analysing performance changes over time, direct evidence on the consequences of succession is derived. Also, earlier studies in the farm sector have been criticised on the grounds that they compare recently transferred companies with those that did not experience succession without controlling for differences in both groups relating to important firm characteristics (firm size, generational level, company's age, region, industry). These factors may influence the probability of a succession event and hence the propensity to grow.[6] Thus, we apply a non-parametric matching approach in the empirical analysis. This approach permits one to find a 'continuation firm' for every 'succession firm' that does not differ in important characteristics at the date of succession (or succession planning).

Our results indicate no significant difference in employment growth between the group of firms that plan succession in the near future and otherwise identical firms without succession plans. In contrast, past succession exerts a significant and positive employment growth effect which becomes stronger over time. Thus, our findings suggest that a "shadow of succession effect" after a business transfer exists.

2. Data

Our analysis is based on a ten-year panel (1995-2004) of more than 4,000 Austrian small and medium-sized manufacturing companies, of which about 90% are family firms. The data is provided by the Austrian Institute for SME Research which is the largest research institute in Austria focusing on small and medium-sized enterprises (SMEs). The institute annually collects extensive information on the employment development of roughly 4,500 manufacturing companies. In 1999, 2002 and 2005 the survey includes information on the firm owner's succession plans.[7] In particular, business owners were asked to report on two aspects of succession. First, they indicate whether they plan to transfer the firm within the following 10 years, and second, they report whether the firm has been handed over to them

[6] Empirical evidence on the probability of succession is provided by Stiglbauer and Weiss 2000 and Glauben et al. 2002.

[7] The extended surveys with the relevant succession information were conducted in 1999, 2002 and 2005 but the gathered information refers to the years 1998, 2001 and 2004. For reasons of simplicity we decided to refer to the former as the relevant dates of interest.

during the last 3 years. Succession plans of roughly 4,000 entrepreneurs are available from each survey. In 1999 about 39% of the respondents indicate that they plan to transfer the firm within the next 10 years. In the same year, about 12% of the respondents report that their firm has been handed over to them within the last three years. Apart from the succession information, the survey conducted in 2005 also covers several firm characteristics such as firm age, the firm owner's age and the number of ownership changes since the foundation of the firm.

In the following, succession data from the 1999 survey is used to analyse the relationship between succession and employment growth in the time period from 1996 to 2004. Not all of the nearly 4,000 firm observations enter the empirical analysis. Further restrictions with respect to the employment figures and the firm characteristics are necessary to obtain the final dataset. First, the dataset does not contain a complete record on the employment development of all firm observations over the entire period. To guarantee that only a minimum of observations is lost, we use three-year employment averages covering the periods from 1996 to 1998, from 1999 to 2001 and from 2002 to 2004. Each firm, of which at least one observation over the relevant three years is available, is considered in that variable. This procedure is also consistent with the questionnaire asking for realised successions within the past three years. Also, it assures that short-run cyclical fluctuations are removed. Second, observations with missing values for firm characteristics are excluded. Moreover, further adjustments pertaining to the variable "number of ownership changes" are necessary as this variable refers to the year 2005. Seeking for factors affecting the propensity of realised (planned) succession in the period from 1996 to 1998, we adjust this variable downward in each case where firm owners reported successions in the 1999 and 2002 surveys respectively. Then, we create four generation dummies for management ownership in the first, second, third, fourth or even earlier generation which can be seen as a good approximate for the generational level of firms prior to succession. The variable firm owner's age is not considered for the empirical analysis since it reflects, for the group of firms that experienced succession, the successor's and not the predecessor's age. Finally, outliers are removed.

Given that our succession variables cover a different number of observations our adjustments yield two final datasets. The first one includes the variable 'planned succession' and covers 1,101 observations, 440 of which reporting succession plans in the upcoming ten years. The second dataset includes the variable 'realised succession' and contains 1,093 observations, 136 of which reporting a business succession between 1996 and 1998. Descriptive statistics of all variables used in the empirical analysis are shown, separately for

both datasets, in Table A.1 in the appendix. To ease the following methodological discussion, companies that experienced succession in the past and/or plan a succession in the future are simply denoted by 'succession firms' whereas companies without any such succession event are denoted by 'continuation firms'.

3. Empirical Analysis

3.1 The Evaluation Problem

Columns 1 and 2 (4 and 5) of Table 1 show that prior to the empirical analysis significant differences in the means of several firm characteristics between recently transferred firms (firms with future succession plans) and their potential controls exist. This concerns the company's size, the generational level, the industry orientation and the regional origin of the firm and indicates that succession firms are special and selective ones. Consequently, a comparison of the employment growth rates at this point in time would lead to biased results. To establish whether firm performance is due to succession or to systematic differences in firm characteristics at the date of succession (succession planning), we need to isolate the causal effect of succession on firm performance.

The matching method is a non-parametric approach to evaluate this causal or treatment effect and goes back to Rubin (1974). The aim is to select sufficient observable factors so that any two firms with the same value of these factors will display no systematic difference in their reaction to the occurrence of succession. Consequently, if each succession firm can be matched with a continuation firm with the same matching variables, the impact on companies of that type can be measured. More precisely, denote by $SUCC_{i,t} \in \{0,1\}$ the scenario that firm *i* experienced succession[8] at the beginning of period *t* showing an employment level of $Y_{i,t}^{1}$ in period *t*, and an employment level of $Y_{i,t+1}^{1}$ in the period following succession. Then, ΔY_i^1 constitutes employment growth if firm *i* experienced succession and similarly ΔY_i^0 represents employment growth if firm *i* were not transferred at the beginning of *t*. The effect of SUCC (the 'treatment') is formally denoted as average treatment effect on the treated (ATT), which gives the difference in the employment change, had the transferred company not been transferred:

[8] We restrict the following demonstration to the case where the firm experienced succession in the past. The case where the firm owner plans a succession in the upcoming years can be constructed similarly.

Table 1
Mean comparison of selected variables

	Realised Succession			Planned Succession		
	(1)	(2)	(3)	(4)	(5)	(6)
Variable	Treatments	Potential Controls	Selected Controls	Treatments	Potential Controls	Selected Controls
$\ln(\text{size}_{\overline{9698}})$	2.664	**2.380**	2.707	2.491	**2.352**	2.485
First Generation	0.669	**0.410**	0.688	0.473	0.431	0.467
Second generation	0.191	**0.365**	0.182	0.327	0.339	0.312
Third generation	0.103	0.098	0.091	0.100	0.103	0.117
Fourth or earlier generation	0.037	**0.127**	0.038	0.100	0.127	0.104
Age of the company	50.500	48.646	46.568	48.714	47.918	49.382
Burgenland	0.066	0.063	0.076	0.057	0.064	0.054
Carinthia	0.073	0.092	0.065	0.084	0.092	0.082
Lower Austria	0.213	0.217	0.182	0.255	**0.198**	0.258
Upper Austria	0.199	0.173	0.231	0.184	0.169	0.189
Salzburg	0.015	0.008	0.016	0.011	0.006	0.011
Styria	0.176	0.139	0.169	0.123	0.156	0.131
Tyrol	0.081	0.073	0.100	0.045	**0.095**	0.037
Vorarlberg	0.096	0.090	0.090	0.077	0.098	0.084
Vienna	0.081	**0.144**	0.071	0.164	**0.121**	0.154
Production oriented	0.728	0.691	0.732	0.657	**0.714**	0.661
Service oriented	0.272	0.309	0.268	0.343	**0.286**	0.339
Unbounded propensity score	-0.934	/	-0.935	-0.203	/	-0.204
Number of observations	136	957	136	440	661	440

Notes: Bold numbers indicate significantly different means between observation from the treatment group and from the potential or selected control group in a t-test for equality of means at the 5% level.

$$ATT = E\left(\Delta Y_i^1 - \Delta Y_i^0 \mid SUCC_{i,t} = 1\right) = E\left[\Delta Y_i^1 \mid SUCC_{i,t} = 1\right] - E\left[\Delta Y_i^0 \mid SUCC_{i,t} = 1\right] \qquad (1)$$

As the counterfactual, i.e. ΔY_i^0, given that $SUCC_{i,t} = 1$ is per definition not observable, the methodological issue is to derive a proper substitute for it. The solution advanced by matching is based on the assumption that given a set of observable covariates X, potential (non-treatment) outcomes are independent of the participation status (conditional independence assumption-CIA) (Rubin, 1977):

$$\Delta Y_i^0 \perp SUCC_{i,t} \mid X \qquad (2)$$

Hence, after adjusting for observable differences, the mean of the potential outcome is the same for those experiencing succession as for those not experiencing succession. This permits the use of matched non-transferred firms to measure how the group of firms with succession in the past would have grown, had they not been transferred. However, this is only valid if it is guaranteed that all treated firms have a counterpart in the non-treated population (common support condition):

$$\Pr\left(SUCC_{i,t} = 1 \mid X\right) < 1 \qquad (3)$$

Anyhow, matching on all variables X becomes unpractical as the number of covariates increases. Solving this dimensionality problem, Rosenbaum and Rubin (1983) propose propensity score matching, the propensity score being defined as the probability of succession for firm i given a set $X = x_i$ of firm characteristics $p(X) \equiv \Pr(SUCC_{i,t} = 1 \mid X = x_i)$. They show that if the conditions in equations (2) and (3) are fulfilled it is sufficient to control for $p(X)$ instead of X to ensure statistical independence between potential outcome and the occurrence of succession.

In our analysis, the propensity scores are derived from two single equation probit models (Maddala, 1983) where the information on succession serves as endogenous variable:

$$E[JSUCC_i \mid X = x_i] = \Pr(JSUCC_{i=1} \mid X = x_i) = \Phi(x_i' \beta) \qquad J = P, R \text{ and } i = 1,...N \qquad (4)$$

$JSUCC_i$ = ($PSUCC_i$, $RSUCC_i$) is our decision variable for planned succession and realised succession. *PSUCC* is set equal to 1 in cases where entrepreneur *i* plans to hand over the firm within the next 10 years and is 0 otherwise. Similarly, *RSUCC* is set equal to 1 where a succession has taken place within the last 3 years and is 0 otherwise. The controls ($X = x_i$) consist of those firm specific and industry-specific variables that have been found as important determinants of succession in literature. These variables include the company's size at the date of succession, the age of the company and dummies for the generational level, the regional origin and industry orientation. $\Phi(\bullet)$ is the cumulative density function of the standard normal and β is the parameter vector to be estimated.

3.2 Matching Estimators

The estimated propensity scores are then used to construct the comparison groups. A variety of different propensity score matching schemes are possible.[9] Each scheme involves the definition of a criterion of proximity and the selection of appropriate weights to associate the selected set of controls with each succession firm. For instance, the neighbourhood may range from a singleton set (one-to-one matching: nearest neighbour or within calliper) to a multiple set, eventually including all control observations (n-nearest neighbours, radius matching, stratification, kernel and local linear regression-based matching). The choice generally relies on the trade-off between bias and variance associated with each type of matching scheme. Generally, increasing the neighbourhood to construct the comparison group

[9] See Heckman et al. (1997), Smith and Todd (2005) and Becker and Ichino (2002) for a detailed description of each of these matching estimators.

will reduce the variance (resulting from using more information to construct the counterfactual for each succession firm) and increase the bias (resulting from using on average more, but poorer matches).

Having defined the neighbourhood, the next issue is that of attaching appropriate weights to their members. The most common weighting schemes involve setting unity (equal) weight(s) to the nearest observation(s) and zero to the others, and kernel weights that are proportional to the closeness of the propensity scores of treated and controls.

In our application we implement multiple nearest neighbours matching. Given that both potential control groups are rather large, the use of more than one nearest neighbour is appropriate. For this purpose, define a neighbourhood $C(P_i)$ for each firm *i* in the set of succession firms $SUCC_1$. Neighbours for *i* are continuation firms $j \in SUCC_o$ for which $P_j \in C(P_i)$. The firms matched to *i* are those firms in set A_i where $A_i = \{j \in SUCC_0 \,|\, P_j \in C(P_i)\}$. Nearest neighbour matching sets:

$$C(P_i) = \min_j \| P_i - P_j \| \qquad j \in SUCC_0 \tag{5}$$

In case of multiple nearest neighbour matching A_i is a set of *k* closest firms to firm *i* where each of these *k* neighbours receives equal weight in constructing the counterfactual mean, that is, the weights $W_1(i, j)$ equal 1/*k* if $j \in A_i$ and equals 0 otherwise. We focus on the case where *k* = 5 and match with replacement which allows a given continuation firm to get matched to more than one succession firm[10]. Since there is no consensus in the literature on the best matching estimator to adopt, we compare our main results from 5-nearest neighbour matching with the ones obtained from one-to-one nearest neighbour matching, kernel matching and radius matching, the latter two applying kernel weights.

3.3 Matching Results

The analysis starts with the estimation of the probit models. Table A.2 in the appendix contains the results of both models. Lagrange multiplier (LM) tests on normality and heteroscedasticity have been carried out to find potential misspecifications that would lead to inconsistent parameter estimates (Verbeek, 2000). In both specifications the normality

[10] Matching with replacement also involves a trade-off between bias and variance. Allowing for replacement increases the average quality of the matches, but reduces the number of distinct continuation firm observations used to construct the counterfactual for each succession firm, thereby increasing the variance of the estimator.

assumption can not be rejected at the 5% level of significance. But it turns out that the variable company's age is a potential source of heteroscedasticity in both models. We tried to incorporate this by estimating heteroscedastic probit models but given that the estimation results were rather unsatisfactory, we finally returned to the almost correctly specified homoscedastic probit models.

The estimated models are statistically significant at the 1% level or better, as measured by the likelihood ratio test. However, it is also evident from Table A.2 that both models differ considerably in their explanatory power. The first model, estimating the probability of succession in the past, correctly classifies 87.37% of all observations. The results are not discussed here in detail. Over all they suggest that the probability of succession is significantly influenced by a number of firm characteristics, including the company's size and age, the generational level and the regional origin. In contrast, the explanatory power of the second model which estimates the probability of having succession plans is rather low. It correctly classifies only 60.94% of all observations. Also, a large portion of the variance in the data can not be explained in this econometric model, as indicated by the relatively low R-squared of 3%. Anyhow, the model is able to identify some firm characteristics that influence the decision whether firm owners plan succession or not. So we finally decided to apply the matching procedure on both datasets.

Matching[11] is regarded as successful if the means of the relevant variables do not differ significantly between the treatment group and the control group after the matching procedure. Columns 1 and 3 (4 and 6) of Table 1 show the means of several firm characteristics between recently transferred firms (firms with future succession plans) and their matched counterparts. The differences are small and not statistically significant at the 5% level as indicated by a t-test. Moreover, the means of the unbounded propensity scores, which can be seen as a summary measure of various variables, do not differ significantly across these groups, indicating a good fit of the matching procedure applied.

The effect of succession on employment development is evaluated by comparing the employment growth rates:

$$\Delta Y^{P}_{t+1,t,i} = \ln(\text{employment}_{t+1}) - \ln(\text{employment}_{t}) \qquad \forall P \in \{0,1\} \tag{6}$$

[11] We use the unbounded $x_i^{'}\hat{\beta}$ rather than the bounded propensity score $\Phi\left(x_i^{'}\hat{\beta}\right)$ because of his preferable distribution properties (Hujer et al., 1997).

between succession firms and their matched counterparts, that is ΔY_i^1 and ΔY_i^0. The growth rates are calculated using three-year averages as well as annual data. The unbiased estimator for the causal effect *ATT* is then the mean difference of the average employment growth rates in these groups:

$$ATT^1 = \frac{1}{N_1}\left(\sum_{i=1}^{N_1}\Delta Y_i^1 - \sum_{i=1}^{N_1}\Delta Y_i^0\right) \tag{7}$$

A positive (negative) effect of succession on employment growth is indicated if ATT^1 is statistically significant in a t-test. Contrary, an insignificant test points to the absence of a 'shadow of succession effect'.

Table 2 gives the results. It shows the development of the employment growth rates for both treatment groups, realised succession and planned succession, and their matched counterparts. The comparison starts with the average three-year growth rates and continues with detailed results for each year. Analysing succession plans, we do not find an impact on employment growth. The causal effect is considerably small and not statistical significant. This holds for both the short-time and the medium–time period and is also confirmed by the annual results. Thus, no significant relationship between future succession plans and employment growth is found. This may have two reasons. First, succession plans could be very vague due to the long planning horizon of ten years. This reduces the liability of the answers and increases the probability of an intention-behaviour discrepancy.[12] Second, one could also reject our hypothesis that future succession plans cast their shadows on firm performance.

In contrast to succession plans, realised succession in the past is found to have a significant and positive impact on employment growth for the $\overline{9698} - \overline{0204}$ time period. While firms without succession in the past realise a negative growth rate of about twelve percent over this period, succession firms grow about three percent. The difference, i.e. the causal effect amounts to about 15 percentage points and is statistically significant at the 1% level. This suggests that employment growth is 15 percentage points larger for firms that experienced succession in the past compared to firms that reported no succession. Given an average level of employment of roughly 18 employees over the 1996 to 1998 time period (see

[12] Authors from different fields of economics (and, in particular, from economic psychology and marketing) have challenged the usefulness of intention measures (such as succession plans) as a predictor for actual behaviour. Foxall (1983), for example, argues that a high intention-behaviour correspondence should be expected only under strictly limited (and unrealistic) conditions. Empirical support for the intention-behaviour discrepancy in succession plans is provided by Väre et al. (2004).

Table 2
Causal Effects: Firm specific Employment Growth

Growth Rate in	Firms	Succession (percent)	No succession (percent)	Causal effect (percentage points)	Test statistic	
Planned Succession						
$\overline{9698} - \overline{9901}$	430	-0.048	-0.039	-0.009	-0.66	
$\overline{9698} - \overline{0204}$	440	-0.100	-0.078	-0.021	-0.93	
$\overline{9698} - 99$	388	-0.047	-0.046	-0.002	-0.18	
$\overline{9698} - 00$	394	-0.049	-0.051	0.001	-0.02	
$\overline{9698} - 01$	401	-0.092	-0.089	-0.003	-0.17	
$\overline{9698} - 02$	396	-0.117	-0.092	-0.025	-1.06	
$\overline{9698} - 03$	398	-0.121	-0.111	-0.010	-0.40	
$\overline{9698} - 04$	437	-0.115	-0.088	-0.027	-0.97	
Realised Succession						
$\overline{9698} - \overline{9901}$	134	-0.016	-0.041	0.025	1.08	
$\overline{9698} - \overline{0204}$	136	0.026	-0.122	0.148	4.37	***
$\overline{9698} - 99$	120	-0.026	-0.054	0.029	1.02	
$\overline{9698} - 00$	124	-0.006	-0.039	0.034	1.15	
$\overline{9698} - 01$	125	-0.066	-0.111	0.045	1.32	
$\overline{9698} - 02$	121	-0.036	-0.142	0.106	2.82	***
$\overline{9698} - 03$	120	0.014	-0.110	0.125	3.38	***
$\overline{9698} - 04$	136	0.028	-0.143	0.171	4.23	***

Notes: Asterisks denote statistical significance in a t-test for equality of means at the 1% (***), 5% (**), or 10% (*) level. 5-Nearest Neighbour Matching.

Table A1), this corresponds to 3 additional new jobs per firm, revealing a considerable medium-run succession effect. Contrary, no such effect is found for the short-time period from $\overline{9698} - \overline{9901}$, indicating that there is a consolidation time period after succession before employment effects are observable. Detailed results for each year give a similar picture. The causal effect is positive but insignificant in the years immediately after succession, but then, from the fourth year onward, displays a strongly significant and positive relationship between succession and employment growth. After some years of consolidation successors start expanding and hire additional employees. Since the firms do not differ in observable characteristics at the date of succession (see columns 4 and 6 in Table 1) two groups with equal pre-succession conditions are compared. Given that unobservable differences between both groups at the date of succession are considerably small, the reported growth effects can be directly attributed to the occurrence of succession. These results remain unchanged when alternative matching estimators are applied as documented in Table A3 in the appendix.

4. Conclusion

The aim of this paper was to analyse the relationship between succession and firm performance. Using a unique panel data set on a sample of roughly 4,000 Austrian family firms we evaluate empirically the impact of realised succession as well as planned succession on employment growth. Analysing succession plans, we do not find a 'shadow of succession' effect. No significant difference in employment growth is found between firms that plan to transfer the firm in the next ten years and those who do not. In contrast, past succession exerts a significant and positive employment growth effect which becomes stronger over time. Thus, our findings provide support for the existence of a positive employment shadow after a transfer, whereas the shadow of succession hypothesis has to be rejected prior to transition.

Two limitations to the results have to be mentioned. First, selection bias is a potentially serious weakness of our analysis as we were unable to study the effects of succession on the probability of firm exits. The results in this paper should be seen strictly as an analysis of employment development inside continuing businesses. And second, the present analysis does not take into account that succession within the family may have different consequences compared to firms where the successor is not a family member. The fact that we focus on successions in general and do not analyse succession within and outside a family separately makes comparison with previous studies in this field difficult.

However, by analysing performance changes over time the present study provides direct evidence on the consequences of succession and can be seen as a major contribution to existing cross sectional studies on this issue. The reported positive employment effect of succession again underlines the importance of succession for the aggregate labour market in Austria. An estimated 51,500 Austrian small and medium sized enterprises will face the challenge of succession over the decade 2004-2013, potentially affecting 438,000 employees or 17% of all jobs in the Austrian industry (Mandl 2004). Therefore, the success of business successions is, not at least because of the effect on the labour market, of particular importance for the economy. Our results strongly support the notion that it is essential to raise public awareness of the importance of business succession as an attractive alternative to starting up one's own business.

References

Almus, M., (2004), The Shadow of Death – An Empirical Analysis of the Pre-Exit Performance of New German Firms, Small Business Economics, 23, pp.189-201.

Anderson, R.C., and Reeb, D.M., (2003), Founding-Family Ownership and Firm Performance: Evidence from the S&P 500, The Journal of Finance, 58(3), pp.1301-1328.

Aronoff, C.E., Astrachan, J.H., and Ward, J.L., (1997), Family Business Sourcebook II. Business Owner Resources, Marietta, GA.

Becker, S.O., and Ichino, A., (2002), Estimation of average treatment effects based on propensity scores, The Stata Journal, 2(4), pp. 358-377.

Foxall, G. R., (1983), Consumer Choice, St. Martins Press, New York.

Gersik, K., Davis, J., McCollom Hampton, Lansberg, I., (1997), Generation to Generation: Life Cycles of the Family Business. Harvard Business School Press, Boston.

Glauben, T., Tietje, H. and Weiss, C. R., (2004), Intergenerational Succession on Farm Households: Evidence from Upper-Austria, Review of Economics of the Household, 2(4), pp. 441-460.

Griliches, Z. and Ragev, H., (1995), Firm Productivity in Isreali Industry 1979-1988, Journal of Econometrics, 65, pp.175-203.

Handler, W.C., (1994), Succession in Family Business: A Review of the Research, Family Business Review. VII(2), pp. 133-157.

Heckman, J.J., Ichimura, H., and Todd, P. (1997), Matching As An Econometric Evaluation Estimator: Evidence from Evaluating a Job Training Programme, The Review of Economic Studies, 64, pp. 605-654.

Hujer, R., Maurer, K.O. and Wellner, M., (1997), The Impact of Training on Unemployment Duration in West Germany, Discussion Paper 74, Department of Economics, Johann Wolfgang Goethe-University, Frankfurt.

Kimhi, A., Kislev, Y. and Arbel, S., (1995), Intergenerational succession in Israeli family farms: Preliminary evidence from panel data, 1971-1988, Working Paper, Department of Agricultural Economics and Management, Hebrew University.

Laband, D.N. and Lentz, B.F., (1983), Occupational Inheritance in Agriculture, American Journal of Agricultural Economics, 36, pp. 311-314.

Maddala, G.S., (1983), Limited Dependent and Qualitative Variables in Econometrics. Cambridge University Press, Cambridge.

Mandl, I., (2004), Business Transfers and Successions in Austria, Paper presented at the EISB conference, Turku, 10th. September.

McConaughy, D.L., Walker, M.C., Henderson, G.V. and Mishra, C.S., (1998), Founding Family Controlled Firms: Efficiency and Value, Review of Financial Economics, 7, pp. 1-19.

Morck, R.K., Strangeland, D.A. and Yeung, B., (1998), Inherited wealth, corporate control and economic growth: The Canadian Disease?, Working Paper 6814, National Bureau of Economic Research.

Neuberg, F. and Lank, A.G., (1998), The Family Business: Its Governance for Sustainability. Macmillan, London.

Perez-Gonzalez, F., (2002), Inherited Control and Firm Performance, Working Paper, Columbia Business School.

Perrier-Cornet, P., Blanc, M., Cavailhes, J., Dauce, P. and Le Hy, A. (1991), Farm Take-Over and Farm Entrance within the E.E.C. Commission of the European Communities, Dijon.

Potter, C. and Lobley, M. (1992), Ageing and Succession on Family Farms: The Impact of Decision Making and Land Use, Sociologia Ruralis, 32(2/3), pp. 317-334.

Rosenbaum, P.R., and Rubin, D.B., (1983), The Central Role of the Propensity Score in Observational Studies for Causal Effects, Biometrika, 70, pp. 41-55.

Rubin, D.B., (1974), Estimating Causal Effects of Treatments in Randomized and Nonrandomized Studies, Journal of Educational Psychology, 66, pp.688-701.

Rubin, D.B., (1977), Assignment to treatment group on the basis of a covariate, Journal of Educational Statistics, 2, pp. 1-26.

Smith, B.F. and Amoako-Adu, B., (1999), Management succession and financial performance of family controlled firms, Journal of Corporate Finance, 5, pp. 341-368.

Smith, J.A., and Todd, P.E., (2005), Does matching overcome LaLonde's critique of nonexperimental estimators?, Journal of Econometrics, 125, pp. 305-353.

Sraer, D. and Thesmar, D., (2004), Performance and Behaviour of Family Firms: Evidence from the French Stock Market, CEPR Discussion paper No. 4520.

Stiglbauer, A. and Weiss, C.R., (2000), Family and non-family succession in the Upper-Austrian farm sector. Cahiers d'économie et sociologie rurales, 54, pp. 5-26.

Väre, M., Weiss, C.R. and Pietola, K. (2005), On the Intention-Behaviour Discrepancy: Empirical Evidence from Successions on Farms in Finland, SFB Discussion Paper no. 3, Vienna.

Verbeek, M., (2000), A Guide to Modern Econometrics. John Wiley & Sons, Chichester.

Ward, J.L., (1987), Keeping the Family Business Healthy. Jossey-Bass, San Francisco.

Weiss, C.R., (1999), Farm Growth and Survival: Econometric Evidence for Individual Farms in Upper Austria, American Journal of Agricultural Economics, 81(1), pp. 103-116.

APPENDIX

Table A1
Descriptive statistics

	Realised Succession		Planned Succession	
Variable	Mean/Share	STDV	Mean/Share	STDV
Average Size $\overline{9698}$	17.507	20.691	17.350	20.309
Average Growth Rate in				
$\overline{9698} - \overline{9901}$	-0.006	0.268	-0.005	0.263
$\overline{9698} - \overline{0204}$	-0.021	0.393	-0.021	0.386
$\overline{9698} - 99$ *	-0.002	0.290	-0.002	0.280
$\overline{9698} - 00$ *	-0.002	0.297	-0.003	0.297
$\overline{9698} - 01$ *	-0.030	0.335	-0.027	0.335
$\overline{9698} - 02$ *	-0.040	0.368	-0.038	0.358
$\overline{9698} - 03$ *	-0.028	0.416	-0.029	0.414
$\overline{9698} - 04$ *	-0.006	0.520	-0.005	0.515
Generation				
First generation	0.442	0.497	0.448	0.497
Second generation	0.343	0.475	0.334	0.472
Third generation	0.099	0.299	0.102	0.302
Fourth or earlier generation	0.116	0.321	0.116	0.321
Age of the company	48.877	33.507	48.636	33.512
Region				
Burgenland	0.063	0.243	0.061	0.239
Carinthia	0.090	0.286	0.089	0.285
Lower Austria	0.217	0.412	0.221	0.415
Upper Austria	0.177	0.381	0.175	0.380
Salzburg	0.009	0.095	0.008	0.090
Styria	0.144	0.351	0.143	0.350
Tyrol	0.074	0.262	0.075	0.264
Vorarlberg	0.091	0.287	0.090	0.286
Vienna	0.136	0.343	0.138	0.345
Industry				
Service oriented	0.305	0.460	0.309	0.462
Production oriented	0.695	0.460	0.691	0.462
Realised Succession $\overline{9698}$	0.124	0.330	-	-
Planned Succession	-	-	0.400	0.490
Number of Observation (*N*)	1093		1101	

* The number of observations used to calculate the growth rate changes, since each firm, of which at least one observation over three years is available, is considered.

Table A2
Results of the probit estimations

Dependent Variable	Realised Succession		Planned Succession	
Independent Variables	Coef.	z-value	Coef.	z-value
$\ln(\text{size}_{\overline{9698}})$	0.602	2.24 **	0.384	2.00 **
$\ln(\text{size}_{\overline{9698}})^2$	-0.081	-1.65 *	-0.052	-1.43
Second generation	-0.847	-6.42 ***	-0.129	-1.38
Third generation	-0.619	-3.28 ***	-0.238	-1.62
Fourth or earlier generation	-1.684	-5.77 ***	-0.492	-2.95 ***
Age of the company	0.009	4.76 ***	0.003	2.01 **
Burgenland	0.565	2.15 **	-0.193	-1.02
Carinthia	0.223	0.91	-0.234	-1.41
Lower Austria	0.330	1.64	-0.021	-0.16
Upper Austria	0.429	2.10 **	-0.157	-1.14
Salzburg	0.739	1.48	0.195	0.45
Styria	0.480	2.29 **	-0.346	-2.37 **
Tyrol	0.476	1.92 *	-0.645	-3.53 ***
Vorarlberg	0.423	1.77 *	-0.315	-1.87 *
Sevice oriented	-0.062	-0.52	0.207	2.41 **
Intercept	-2.430	-6.34 ***	-0.746	-2.87 ***
Number of observations		1093		1101
LogL		-367.346		-718.932
LR chi-squared (15)		86.49		43.78
Prob > chi-squared		0.0002		0.0001
Pseudo R^2		0.1053		0.0296
% Correct predictions		87.37		60.94

Notes: The left out categories are ‘First Generation’ and ‘Vienna’. Asterisks denote statistical significance at the 1% (***), 5% (**), or 10% (*) level.

Table A3
Causal Effects using different Matching Estimators: Firm specific Employment Growth

Growth Rate in	Firms	Succession (percent)	No Succession (percent)	Causal effect (percentage points)	Test statistic	
Realised Succession						
$\overline{9698} - \overline{9901}$						
One-to-one Nearest Neighbour	134	-0.016	-0.008	-0.007	-0.21	
5-Nearest Neighbour	134	-0.016	-0.041	0.025	1.08	
Radius (radius < 0.05)	133	-0.016	-0.042	0.026	1.47	
Kernel (Gaussian Kernel)	134	-0.016	-0.040	0.025	1.46	
$\overline{9698} - \overline{0204}$						
One-to-one Nearest Neighbour	136	0.026	-0.095	0.121	2.57	**
5-Nearest Neighbour	136	0.026	-0.122	0.148	4.37	***
Radius (radius < 0.05)	135	0.025	-0.106	0.131	5.16	***
Kernel (Gaussian Kernel)	136	0.026	-0.102	0.128	5.38	***
Planned Succession						
$\overline{9698} - \overline{9901}$						
One-to-one Nearest Neighbour	430	-0.048	-0.051	-0.003	-0.08	
5-Nearest Neighbour	430	-0.048	-0.039	-0.009	-0.66	
Radius (radius < 0.05)	430	-0.048	-0.038	-0.010	-0.75	
Kernel (Gaussian Kernel)	430	-0.048	-0.038	-0.010	-0.73	
$\overline{9698} - \overline{0204}$						
One-to-one Nearest Neighbour	437	-0.100	-0.128	0.028	0.88	
5-Nearest Neighbour	437	-0.100	-0.078	-0.021	-0.93	
Radius (radius < 0.05)	437	-0.100	-0.094	-0.005	-0.27	
Kernel (Gaussian Kernel)	437	-0.100	-0.094	-0.006	-0.29	

Notes: Asterisks denote statistical significance in a t-test for equality of means at the 1% (***), 5% (**), or 10% (*) level.