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Conference Paper

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Beiträge zur Jahrestagung des Vereins für Socialpolitik 2016: Demographischer Wandel -
Session: Firm Behavior: Theory and Evidence, No. B24-V1

Provided in Cooperation with:

Verein für Socialpolitik / German Economic Association

Suggested Citation: Mühlbauer, Stefan (2016) : Foundation owned firms - a delegation approach, Beiträge zur Jahrestagung des Vereins für Socialpolitik 2016: Demographischer Wandel - Session: Firm Behavior: Theory and Evidence, No. B24-V1, ZBW - Deutsche Zentralbibliothek für Wirtschaftswissenschaften, Leibniz-Informationszentrum Wirtschaft, Kiel und Hamburg

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Foundation owned firms - a delegation approach

Stefan Muehlbauer*

Abstract

Foundation owned firms are an interesting research object to test ownership influence on firms' performance. Research claims that the foundation as an organization without natural owner leads to significant agency cost because there is no residual claimant with an incentive to control. Nevertheless, this inferior performance could not be found empirically (Herrmann, 1997; Thomsen, 1999; Thomsen and Rose, 2004).

This paper gives an explanation for this puzzling result: most foundation owned firms are not as owner-less as it seems. The presented model is the first to analyse game theoretically a firm succession decision with the option to choose a foundation as successor, a form of succession very popular in Central and Northern Europe. More precisely the succession decision is analysed in a delegation model by Holmstrom (1977) and Melumad and Shibano (1991). It is assumed that the founder can either pass his firm on to his successor or donate his firm to a foundation. It is shown that a foundation as successor can be rational, by setting it up and designing it, the founder can restrict the successors discretion and therefore can prevent specific events from happening, for example the sale of his firm. The model illustrates the basic trade-off a founder faces. In order to keep control he has to sacrifice adaptability of future management. The founder leaves his successor as actual owner despite donating it to a foundation. This could explain the many ways foundations and firms are legally arranged in Germany and could have important implications for future empirical research on foundation owned firms¹.

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¹First draft, comments are most welcomed

1 Introduction

Foundation owned firms are an interesting research object for testing ownership influence on firms' performance. A foundation as an organisation without physical owner leads to significant agency cost because there is no residual claimant with an incentive to control. Nevertheless this inferior performance could not be found empirically (Thomsen, 1996; Herrmann, 1997; Thomsen and Rose, 2004; Franke and Draheim, 2015).

While most of previous empirical research tests whether foundation owned firms perform worse than family owned firms and why they do not, this model asks if choosing a foundation as a succession solution in family firms is a rational decision and why. The decision about ownership and succession in family firms is endogenized. It is considered the decision of an owner and founder of a firm whether to pass it on to his heir or to set up a foundation as owner. This is done in a principal agent model of Holmstrom (1977) und Melumad and Shibano (1991). That means that the succession process which is extensively analysed in research to succession in family firms (Churchill and Hatten, 1997; Breton-Miller et al., 2004; Michael-Tsabari and Weiss, 2013) is condensed to a one shot game.

The literature on succession in family firms can be systematized in four areas of interest. There is a vast number of articles about the two main protagonists founder² and successor³. The other two branches deal with the succession process⁴ and the ex post succession performance⁵ (Blumentritt et al., 2013, p. 51).

The importance of the research on succession in family held firms becomes clear once one learns that only a third of family firms survives the second generation of family management and only 10-15 % the third generation [Breton-Miller et al. (2004, p. 305), Ward (2011)]. Following that, it is hardly surprising that most of the research literature focuses on the challenges and potential mistakes and tries to find solutions for the problems arising. As is stated by Brockhaus (2004, p. 170), a predominant part of this research is of empirical nature which is not always convincing as far as methodology is concerned. Formal theoretical contributions and especially game theoretic contributions are rare: Blumentritt et al. (2013) introduce game theory as a model for examining succession in demonstrating possible applications of game theoretic concepts. Michael-Tsabari and Weiss (2013) use game theory to explore the impact of poor interpersonal

²For further literature see (Malone, 1989), (Marshall et al., 2006), (Davis and Harveston, 1999)

³For further literature see Goldberg and Wooldridge (1993), Chrisman et al. (1998), Dyer (1988)

⁴See Breton-Miller et al. (2004, p. 305), (Sharma et al., 2001), Churchill and Hatten (1997), Michael-Tsabari and Weiss (2013)

⁵See for example Miller et al. (2003), Breton-Miller et al. (2004), Ward (2011)

communication on family harmony during the succession process. Most closely to the model at hand is the one of Burkart et al. (2003) who analyse the factors determining the founder's succession decision. Their model explores the incentives that influence the founder's decision on whether to hire a professional manager or leave management to his heir, and secondly, what fraction of the company to float on the stock exchange.

However, in Germany or Denmark for instance there is another, very popular way for the founder of how to settle the succession: setting up a foundation with ownership in his firm. This ownership category is mostly found in Central and Northern Europe where some of largest companies are foundation owned, for example Robert Bosch GmbH in Germany, IKEA in Sweden or Carlsberg in Denmark. In Germany 740 firms are presumably owned by a foundation, even though the exact number is not known (Franke and Draheim, 2015, p. 11)⁶. A foundation as an owner seems to be at odds with standard economic rationale since a foundation is not owned by a legal or natural person but constitutes an institution pursuing a particular purpose given by the donor. This purpose can be of a charitable or private nature.

Not only does the organisation's lack of ownership appear to be at odds with standard economics, but also these organisations vary tremendously in design, for example in the functional relationship of foundation and firm, which implicates that a stylized formal analysis like this presents a challenge.

This model examines why an owner chooses a foundation as a succession alternative, what determines the design of it and what implications the results have on future empirical research. In summary it is rational for an owner to choose a foundation as an owner of his firm to prevent particular events, for example the selling of his company. Thereby the owner gives ample scope to his successor in order to assure the necessary range of action to be able to react flexible to changes in environment. Therefore successors act as implicit owners despite the fact that the foundation is the legal owner. This could explain the huge variety on how foundations and firms are legally arranged in Germany. For instance concerning the degree to which the foundation, as institutionalized purpose, or the owner's family have the power to influence the firms management. There are foundation-firm-family-arrangements in which the founders family is still hugely influential, as in the Bertelsmann AG, and there are foundation-firm-family-arrangements in which the foundation, as a institutionalized purpose, is most dominant on the management, for example Carl Zeiss.

⁶In the United States of America this ownership category is of no importance since foundations are not allowed to own more than 20% of a company the shares owned by the donors family included (Fleischmann, 2003, p. 368)

In order to analyse this setting the delegation model of Holmstrom (1977) and Melumad and Shibano (1991) is applied. This approach is very powerful as its many applications, for example in political economics⁷, regulation⁸ or organizational economics⁹ show. Basically these models consider when delegation an action to an agent is optimal and what variables determine this decision. Hence the problem of firm succession is condensed to a one dimensional control problem between founder and successor.

This paper is organized as follows. In section 2.1 the model is presented and motivated. Section 2.2 and 2.3. show the theoretical findings before section 3 discusses some of the results and concludes. As this paper aims at introducing game theory to the research on industrial foundations, the presented methods and results will be explained in detail. Furthermore the model and its results will be illustrated by a concrete example.

2 Model

This model focuses exclusively on founder and successor, both which are the two central elements of a firm succession decision (de Vries, 1994; Chrisman et al., 1998; Goldberg and Wooldridge, 1993). Problems in succession, arising from the existence of multiple successors like siblings (Barnes, 1988) or founders, are not considered here in order to make the basic mechanisms tangible that drive the founder's decision. Possible extensions would be deserving of future research.

Like Melumad and Shibano (1991) and Holmstrom (1977) the founder's (u) and successor's (n) preferences are represented by the (non-monotone) quadratic utility functions, which depends on the outcome of management $x(a, \epsilon)$ and an ideal point x_i summarizes the player's preferred management outcome:

$$U_i(x, x_i) = -(x(a, \epsilon) - x_i)^2 \text{ mit } i = \{u, n\} \quad (1)$$

The successor's ideal point is located further right on this one dimensional line of this spatial model, as it is assumed that $x_n > x_u$ with $x_i \in \{0, 1\}$. The difference $x_n - x_u$ measures the preference divergence between founder and successor¹⁰.

⁷See McCubbins et al. (1987), Epstein and O'halloran (1994) and Epstein and O'halloran (1996), Epstein and o'Halloran (1999), Moe (2012)

⁸See Armstrong (1994)

⁹See Crawford and Sobel (1982), Dessein (2002), Harris and Raviv (2005), Gibbons et al. (2013) and Alonso and Matouschek (2008)

¹⁰In public firm this systematic preference divergence could be the agency problem arising from the separation of decision management and decision control Jensen (1986) as the manager tends to build an empire more to his own benefit than to the greater good of the company he manages

Possible conflicts between the founder and successor are widely discussed in family firm literature. Both could differ regarding their commitment to the company. While the enterprise is a lifetime achievement for the founder and therefore often becomes part of their core identity (de Vries, 1994, p. 68), successors often lack this kind of commitment due to a general lack of motivation (Sharma and Irving, 2005) or career alternatives (Handler, 1994). Other resources for conflicts of interests are father-son-problems in general. In family firms these problems easily become business problems (de Vries, 1994). Equivalent to (Chami, 2001, S. 7) one could also think of asymmetric altruism, where the founder cares about his child and wants it to succeed while the successor only thinks about her own benefit.

In a concrete example x_i could be standing for the extent of non-family influence on the firm's management. While the founder wants his legacy to remain in family control and not to be jeopardized by external interests, the successor wants to open the firm for external investors, in order to stimulate growth (Tirole, 2010, p. 115) or to freeride (Jensen and Meckling, 1976).

The players compare the management's outcome $x(a, \epsilon)$ with the ideal point x_i as a reference point. This outcome depends on an action a in a state of nature ϵ . Given a certain ideal point the players try to minimize the difference between ideal point and outcome by choosing an action a in the state of nature ϵ . Note that x_i is independent of the state of nature. In the example at hand the action a could be the share sold to external investors and ϵ could summarize the firms economic situation, for instance the market environment or its cost structure. Therefore the outcome is

$$x = a - \epsilon \tag{2}$$

Following Melumad and Shibano (1991, p. 176), for simplicity the prior probability distribution over environments is uniform over $\epsilon \sim \mathcal{U}[0, 1]$. It summarizes all information regarding the decision in one dimension, as standard in delegation literature (Holmstrom, 1977; Melumad and Shibano, 1991; Gilligan and Krehbiel, 1987). As the founder exits the company he only knows the probability distribution¹¹.

Owners who decide about firm's succession orientate themselves at attributes of their potential successor (Burkart et al., 2003; Breton-Miller et al., 2004; Goldberg and Wooldridge, 1993; Chrisman et al., 1998). For simplicity, all these attributes are concentrated in two

¹¹Another example that motivates the intuition behind the model: $x(a, \epsilon)$ could be the firm's equity ratio depending on the firms annually payout policy a . While the founder aims at a very high equity ratio in the long-term the successor could favour a more shareholder friendly payout policy

dimensions: attitude and quality. The attitude of the successor is captured in her ideal point x_i . Her quality is incorporated as a mistake $\tilde{\epsilon}$ she makes by assessing the state of nature ϵ . This mistake depends on her quality E so her expected state of nature, then, is

$$E[\epsilon] = \epsilon - \tilde{\epsilon} \text{ mit } \tilde{\epsilon} \sim \mathcal{U}[-E, E] \quad (3)$$

Thereby her quality is lower the higher E is, or to put it differently her quality rises the lower the variance of her mistake. The founder knows about this mistake and its uniform prior probability distribution.

The literature on succession in family firms considers the successor's abilities as a central key element of an effective succession (Breton-Miller et al., 2004, p. 305). Burkart et al. (2003, p. 2172) even call it a systematic competition disadvantage of family firms. If the founder wants to pass his firm on to his heir he can only choose a successor out of his family instead of the bigger job market for professional managers. That means the successors ability is likely to be lower than average. Breton-Miller et al. (2004, p. 305) also call this smaller pool of competent managers a challenge for family firms. Interviewing more than 500 managers of family firms Chrisman et al. (1998, p. 24) name intelligence, experience and her ability to make the right decision as the successor's key attributes .

Figure 1 illustrate the different types of successors depending on their attitude and their quality:

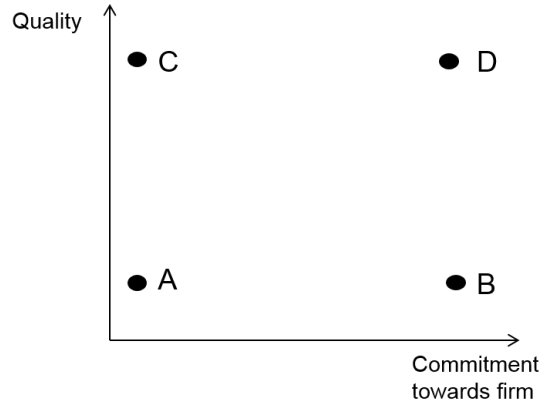


Figure 1: Successor - attitude and quality

Figure 1 shows four stylized cases. Case A is the so called worst case: the successor

does not show the necessary attitude nor high quality ¹². Case D in contrast is the founders most favourite scenario: high quality and a strong commitment to the firm. In situation C the successor is in fact well educated but lacks of commitment towards the firm as she has a different ideal point than the founder. Incorporated in the model a successor in Case C has a small likelihood to make a mistake but will systematically aim for a higher outcome corresponding to her ideal point. In our concrete example the successor in case C is able to assess the firm's current state but is looking for more external investors¹³. Scenario B is according to Burkart et al. (2003), Breton-Miller et al. (2004), Morck et al. (1998), Pérez-González (2006) the most likely case: a successor with a similar attitude towards the firm but with inferior quality.

Following this, the entrepreneur needs to consider whether his successor wants to carry on his legacy (attitude) and whether she has the ability to build on his legacy (quality). In this model the main assumption is that he can only choose between passing his firm on to his heir or setting up a foundation.

If the founder passes his firm on to his heir he gives her the unrestricted right to choose an action a in state of nature ϵ wherefore she will manage the firm according to her preferences and her quality. If the successor differs strongly in preferences or is very poorly talented the founder now has the possibility of restricting the successors discretion by setting up a foundation and designing the foundation-firm-family-arrangement in order to prevent the most undesired outcomes or even to exclude his heir completely from managing the firm.

By donating his firm to a foundation he makes the foundation the owner of his company and he can design this foundation according to his own vision. A foundation is a private nonprofit entity whose assets then consists primarily of a controlling equity interest in a conventional business company(Thomsen and Hansmann, 2013, p. 3). The founder determines the relationship between foundation and firm, between family and foundation and therefore between family and firm by choosing a purpose and writing the foundation's charter (Hof, 2009a, p. 166ff.). Next to the purpose which determines whether the foundation is of charitable or private nature and thus determines whether the foundation is tax-exempt he can exert significant influence on who is allowed to make particular decisions. For example he is able to endow certain people with special control rights and grant himself special rights (Hof, 2009a, p. 189). Once legally acknowledged the foundations charter is a guideline for all stakeholders of the foundation,

¹²Case A could also stand for a situation with no successor at all, e.g. a childless founder.

¹³Case C could also stand for the situation in which there is an external manager running the company

which restricts their discretion (Jacop, 2006, p.146).

Formally the foundation is incorporated by the founder's possibility of restricting the outcomes of the successors management to the interval from 0 to \bar{x} . If the founder wants to save his firm from external influence he can choose a foundation and by doing so and designing it he can prevent his successors selling his firm (Berndt and Götz, 2009). If he passes his firm on to his heir he expects the outcome X_v .

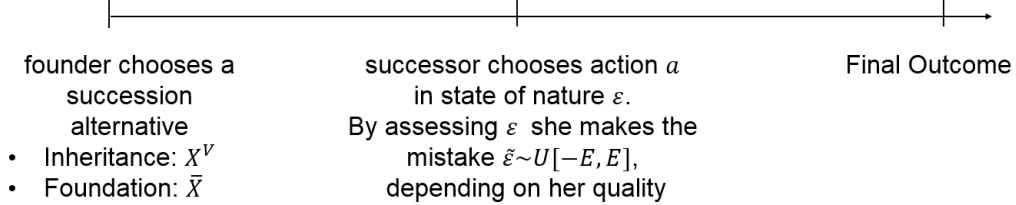


Figure 2: The timing of the model

Figure 2 presents the model's timing. At date 0, the founder chooses between passing his firm on to his heir or setting up a foundation ¹⁴. Given the succession decision by the founder at date 1 the successor takes an action a in state of nature ϵ to manage the company which leads to outcome $x(a, \epsilon)$.

By leaving future management decisions to his heir the succession decision becomes a delegation problem for the founder. As the founder retires and exits the business, his successor becomes better informed about the business than him. So instead of making decisions outside the company (or in extreme case out of the afterlife by will) the founder leaves decisions to her. But this comes at a cost: loss of control as the successor systematically decides differently. The information advantage resulting from the delegation to the better informed successor first was formally derived and stated by Holmstrom (1977) and is called *uncertainty principle* (Huber and Sterr-Kölln, 2006, p. 260). If the founder chooses to take action by himself he can only make the decision given an expected state of nature rather than the real state of nature. By doing so he wastes the successor's information and puts himself in a worse situation. By delegating the decision to his heir he eliminates this problem. Note that depending on the size of the successor's error (her quality) the information advantage could fade. Also, the founder risks that she will use her information against him and will aim at a different ideal point than his. The further to the right this ideal point is the less attractive delegation

¹⁴The assumption that the founder decides about the way of succession all by himself is in fact backed by empirical findings of (Marshall et al., 2006, p. 364) and (de Vries, 1994, p. 68). However, one could also think of the succession process as a bargaining between founder and successor (Michael-Tsabari and Weiss, 2013).

becomes. This principle was also first derived and stated by Holmstrom (1977) and is called the *ally principle* (Huber and Sterr-Kölln, 2006, p. 260).

Naturally, in this kind of delegation model by Holmstrom (1977) a firm's management as the bundle of operative and strategic decisions is reduced to one point in this one dimensional space. However, this happens in order to examine in the most comprehensible way when it is rational for a founder to set up a foundation. Formal extensions, for example $x(a, \epsilon)$ is a vector of outcomes depending on a vector of actions, can be achieved easily¹⁵. This would make the model more realistic but it wouldn't necessarily help understanding the basic trade-off of a founder deciding about his succession: maintaining influence vs. ensuring flexibility for future decision maker (Jacop, 2006, p. 205).

2.1 Inheritance

Firstly the case of inheritance is considered. In order to find a subgame perfect equilibrium in this extensive game backwards induction is applied¹⁶. When the founder chooses his succession alternative, he will anticipate the successor's utility maximizing action.

In the case of inheritance the successor, at date 1, maximizes his expected utility EU_n^V by choosing action a . By the assessing of the state of nature ϵ she makes a mistake. She does not know the exact extent of the mistake $\tilde{\epsilon}$, she knows only that it is uniformly distributed and depends on her quality E , $\tilde{\epsilon} \sim \mathcal{U}[-E, E]$ ¹⁷. The successor's optimization problem, then, is

$$\max_a EU_n^V = - \int_{-E}^E \underbrace{(a - \epsilon - \tilde{\epsilon} - x_n)^2}_{x^V(a, \epsilon, \tilde{\epsilon})} d\tilde{\epsilon} \quad (4)$$

After rewriting the first order condition the successor's optimal action is given by her ideal point and the state of nature¹⁸

$$a_n^* = x_n + \epsilon + \underbrace{0}_{E[\tilde{\epsilon}]} \quad (5)$$

As you easily can see the successor minimizes her expected loss by choosing a to reach an outcome $x^V(a, \epsilon, \bar{\epsilon})$ equal to her ideal point x_n given the state of nature and her

¹⁵See for example Koessler and Martimort (2012)

¹⁶See Selten (1975) and Selten (1978)

¹⁷For further scenarios with agents who know about their bounded rationality, see DellaVigna and Malmendier (2004) and Tirole (2002)

¹⁸Note that the expected value of her error is zero as it is uniformly distributed around zero

quality. Note the strict monotone relation between action and state of nature. This will be of some importance later on. Figure 3 illustrates this. The successor will choose an action on the one dimensional space between zero and one to get from a given state of nature to her idealpoint x_n .

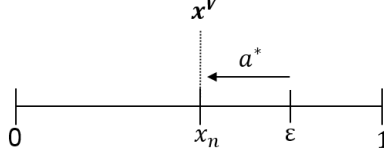


Figure 3: The successor's optimal action

When the founder thinks about which succession alternative to choose he will anticipate the successor's behaviour and will evaluate the outcome in the case of inheritance $x^V(a, \epsilon, \tilde{\epsilon})$. Moving backwards in the game this outcome is plugged into the founder's utility function. His expected utility, then, is

$$\begin{aligned}
 EU_u^V(a_n^*) &= - \int_{-E}^E \underbrace{(x_n + \epsilon + 0 - \epsilon - \tilde{\epsilon} - x_u)^2}_{\substack{a_n^*(\epsilon, \tilde{\epsilon}) \\ x^V(a_n^*, \epsilon, \tilde{\epsilon})}} d\tilde{\epsilon} \\
 &= \underbrace{-(x_n - x_u)^2}_{\text{divergence in preferences}} - \underbrace{\frac{E^2}{3}}_{\text{Var}[\tilde{\epsilon}]}
 \end{aligned}$$

Thus, it can be seen that the founder's expected loss in case of inheritance depends on the divergence in preferences and his successor's quality. Thereby the expected loss increases the lower (higher) the successor's quality (the error's variance) and the more founder's and successor's preferences diverge.

The first part of this result follows Holmstrom (1977, p.40f.) stated *ally principle*. The utility from delegating a decision is higher the more aligned principal's and agent's preferences are. The second part of the result is indeed new in this form but hardly surprising. Logically equivalent to Homstrom's *uncertainty principle* the founder dislikes the uncertainty arising from the successors quality. New about this contribution is that this uncertainty is caused by the agent¹⁹.

¹⁹One could also think of different technologies modelling this uncertain quality. For example the agents could vary in cost incurring in the process of information acquisition Szalay (2005)

Regarding the intuitive example to this model the founder would have a minimum of utility loss if his successor, like him, wants to keep non-familiar influence at a minimum and does not make any mistake. The control over firms affairs stays in the family²⁰. However, the more the successor wants to open the firm for outside investors or the more he wrongly assesses the firms economic environment the higher the founder's expected loss resulting from inheritance. In this case the control over his legacy falls into strangers' hands and thus is jeopardized by his heir.

Proposition 1. *The expected utility loss resulting from inheritance increases with decreasing successor's quality, $E \uparrow$, and increasing divergence in the players' preferences $(x_n - x_u) \uparrow$.*

Proof. See appendix. □

However, how does the founder react if his heir is untalented or unwilling? Following Burkart et al. (2003) the founder could then sell his firm. This would mean the loss of family control over the business, a loss in *amenity potential*. Alternatively he could hire a professional manager and keep the ownership. But when control is turned over to a professional, decision making and decision controlling become separated. Thus his decision on selling or keeping his firm depends on the quality of legal investor protection (Burkart et al., 2003, p. 2169). This paper extends this view by examining an additional option for the founder: setting up a foundation as the owner of his firm.

2.2 Foundation

As shown above the founder has to expect his successor to act differently on a systematic scale as $x_n > x_u$ and the successor will make mistakes by doing that. In summary this can move the final outcome $x^V(a, \epsilon, \bar{\epsilon})$ even further to the right of his ideal point than he already expects due to the preference divergence. Figure 4 illustrates this.

The successor will choose action a to reach the outcome $x(a, \epsilon)$ nearest to her ideal point x_n given the state of nature ϵ . Since $x_n > x_u$ this results in an outcome to the right of the founder's ideal point. From the perspective of the founder the successor's lack of quality can result in another depreciation to the right. Illustrated by the dashed line the final outcome can scatter around the successor's ideal point depending on her quality. The successor could not only sell more shares due to her preferences but could

²⁰Burkart et al. (2003) call this nonpecuniary private benefit of the preservation of family control *amenity potential*

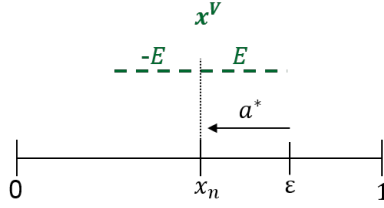


Figure 4: Expected outcome in case of inheritance

also assess the firm's economic condition too pessimistic, and therefore overestimates the need of new investors for the firm.

If the founder wants to prevent his successor to sell his firm, in Germany or Denmark, he has the option to set up a foundation and endow his firm to fulfil the foundation's purpose. Once a foundation gets a stake in the firm, this stake usually cannot be sold (Franke and Draheim, 2015, p. 4).

Once he contributes his firm to a foundation he makes the foundation owner. A foundation is an organisation without natural or legal owner the founder can design according to his requirements. By specifying the foundation's purpose and writing the foundation's charter he determines the relationship between foundation and firm, between family and foundation and thus between family and firm. The foundation's purpose forms the foundation's identity as it determines the beneficiaries of the foundation. Both, purpose and charter, have to be regarded as a directive for all the foundation's boards and even limit the influence of the state offices, which have to approve and control foundations (Hof, 2009a, p. 166ff.).

Apart from setting a purpose the founder can allocate decision rights precisely by writing the foundation's charter. He can determine the number and size of boards running his foundation, the way members of the board are appointed, he can stipulate voting procedures, can stipulate necessary prerequisites, members of the board have to fulfil, and reasons for dismissal of the foundation's committees (Hof, 2009b, p. 227). Furthermore, he can allocate special rights to himself and to others beyond their function as beneficiaries of the foundation's purpose (Hof, 2009a, p. 189). Once approved by a German state the foundations charter is a corridor guideline for all stakeholders, in which influence of third parties is granted and restricted by the founder (Jacop, 2006, p.146).

In summary, the founder has extensive options to restrict the foundation's and thus the firm's management's discretion. He can inter alia prevent his firm from being sold by endowing it to the foundation (Berndt, 2004) or can set a very conservative directive regarding future payout policy (Handelsblatt, 2016).

Incorporated in the model the founder can restrict the space of outcomes the successor can reach by choosing a , to $x \in [0, \bar{x}]$. So outcomes to the right of \bar{x} are ruled out. This exclusion of outcomes corresponds to an action by default in particular state of nature dictated by the founder. Thus, this is equivalent to setting a limit \bar{a} to the successor's actions. The optimal delegated decision subset is an interval (Melumad and Shibano, 1991, p. 179).

By this means the founder divides the successors action space in two subsets. In subset one the successor is free to choose his action. In subset two however she has to choose \bar{a} predetermined by the founder. Since $a(\epsilon)$ is strict increasing in ϵ this is equivalent to the founder setting $\bar{\epsilon}$. Thus the successor is free to choose her favoured action if $\epsilon < \bar{\epsilon}$ but if $\epsilon > \bar{\epsilon}$ she has to carry out the founders predetermined action $\bar{a} = a_n(\bar{\epsilon})$.

By charting a high $\bar{\epsilon}$ the founder wants to prevent extreme outcomes of the successor's management that, if not on purpose, could occur due the successor's lack of quality. Nevertheless the successor still has a relatively high discretion. The founder for example could endow his firm to a family foundation. By doing so he would prevent his heir from selling the firm but simultaneously ensure her influence on the firm as she still has control rights due to her status as beneficiary.

On the other hand a low $\bar{\epsilon}$ stands for strong influence on the firm's management by the foundation and therefore the founder's will, manifested in the foundation's charter. In delegation words: instead of decentralized decision making by the successor the decision is centralized. Consequently the successor's discretion shrinks and with it her ability to react to the assessed state of nature. Specifically, the founder could choose a foundation construction which not only precludes a selling of his company but also predetermines further aspects concerning firms management. For example in the foundation's charter the founder could stipulate a high earnings retention rate.

The founder's expected utility, then, is

$$EU_u^S = - \underbrace{\int_{-E}^E \int_0^{\bar{\epsilon}} (x^V - x_u)^2 f(\tilde{\epsilon}) d\epsilon d\tilde{\epsilon}}_{\text{exp. loss due to inheritance}} - \underbrace{\int_{\bar{\epsilon}}^1 (\bar{x} - x_u)^2 d\epsilon}_{\text{exp. loss due to foundation}} \quad (6)$$

In contrast to standard delegation literature, for example Gibbons et al. (2013, p.402) or Melumad and Shibano (1991, p. 174), there is no commitment problem. Usually in the case of delegation the question arises whether commitment to \bar{a} is possible. If committing was not possible the agent would have no incentive to reveal his information since he must expect the principal to reoptimize once the information is revealed. Therewith

delegation would never be optimal. This is why in formal analysis it is assumed that the principal is able to commit. In this case commitment is possible, since the founder's will is protected by state law. Once a foundation is legally approved by state offices, charter and foundation design are very difficult to change. Furthermore every change needs state's approval.

With an outcome $x^V = a_n^* - \epsilon - \tilde{\epsilon} = x_n + \epsilon + 0 - \epsilon - \tilde{\epsilon} = x_n - \tilde{\epsilon}$ if the successor chooses freely and an outcome $\bar{x} = \bar{a} - \epsilon = x_u + \bar{\epsilon} - \epsilon$ resulting from his stipulated action \bar{a} the founder's optimization problem, then, is:

$$\begin{aligned} \max_{\bar{\epsilon}} EU_u^S = & - \int_{-E}^E \int_0^{\bar{\epsilon}} \underbrace{(x_n + \epsilon + 0 - \epsilon - \tilde{\epsilon} - x_u)^2}_{x^V(a_n^*, \epsilon, \tilde{\epsilon})} f(\tilde{\epsilon}) d\epsilon d\tilde{\epsilon} \\ & - \int_{\bar{\epsilon}}^1 \underbrace{(x_u + \bar{\epsilon} - \epsilon - x_u)^2}_{\bar{x}(\bar{a}, \epsilon)} d\epsilon \end{aligned}$$

As you easily can see in restricting the successor's discretion by choosing $\bar{\epsilon}$ the founder has to trade off the successor's information and his loss of control.

$$\begin{aligned} \max_{\bar{\epsilon}} EU_u^S = & - \underbrace{\int_{-E}^E \int_0^{\bar{\epsilon}} ((x_n - x_u) - \tilde{\epsilon})^2 \frac{1}{2E} d\epsilon d\tilde{\epsilon}}_{\text{exp. loss due to inheritance: loss of control}} - \underbrace{\int_{\bar{\epsilon}}^1 (\bar{\epsilon} - \epsilon)^2 d\epsilon}_{\text{exp. loss due to foundation: loss of flexibility}} \end{aligned}$$

The first order condition illustrates this even better. The founder trades off the marginal loss due to inheritance, resulting from leaving the management to his heir, and the marginal loss due to setting up a foundation, resulting from his guidelines. The loss due to inheritance increases the higher the divergence in preference and the lower the successor's quality. The loss due to setting up a foundation results from giving up the possibility to react accordingly to the state of nature. Stipulating $\bar{\epsilon}$ means a loss in adaptability for future management. It increases with the underlying uncertainty. The first order condition reads

$$(x_n - x_u)^2 + \frac{E^2}{3} = (1 - \bar{\epsilon})^2$$

After some simple rewriting you can easily see that the successor's discretion decreases

the more her preferences diverge from the founder's ideal point and the lower her quality is. In summary, if facing an untalented or unwilling successor the founder will set up a foundation and transfer ownership to the foundation, and by doing so and specifically designing it, he will restrict the successor's discretion. If there is no successor at all the founder can ensure his legacy and stipulate precise and legally binding guideline to future management, so his firm will be managed by his will. This is in line with Berndt (2004) and Fleschutz (2008) who list a foundation construction as a succession alternative in the absence of successors.

$$\bar{\epsilon}^* = 1 - \left((x_n - x_u)^2 + \frac{E^2}{3} \right)^{\frac{1}{2}}$$

Proposition 2. *If the founder decides to set up a foundation as firm succession alternative he has to trade of loss control and adaptability loss of future management. Successor's discretion increases the higher her quality ($E \downarrow$) and the more aligned the player's preferences ($x_n - x_u$) \downarrow .*

Proof. See appendix. □

Figure 5 illustrates an interesting detail of this result: The founder places greater value on the divergence of preferences than on the successor's quality. In the literature on succession in family firms this is explained for example by emotions or amenity potential (Chami, 2001; Sharma and Irving, 2005; Burkart et al., 2003). This paper provides a new reason: Since the conflict of interests is certain the consequences of poor quality are not and can likely be not in the founder's favour. This means that weighing the former over the latter does not have to be irrational.

In concrete terms the founder can prevent that a certain level of non-familiar influence is exceeded by transferring ownership to a foundation. Berndt and Götz (2009, p.381) point out that foundations are often chosen to prevent hostile takeover. Thereby the founder has to take the adaptability loss into consideration which is related to the foundation set-up. If his firm was in need of fresh capital his successor could struggle to get it.

2.3 Succession Decision

Taking $\bar{\epsilon}^*$ into account the founder's expected utility due to setting up a foundation is

$$EU_u^S = -1 + \frac{2}{3} \left((x_n - x_u)^2 + \frac{E^2}{3} \right)^{\frac{1}{2}}$$

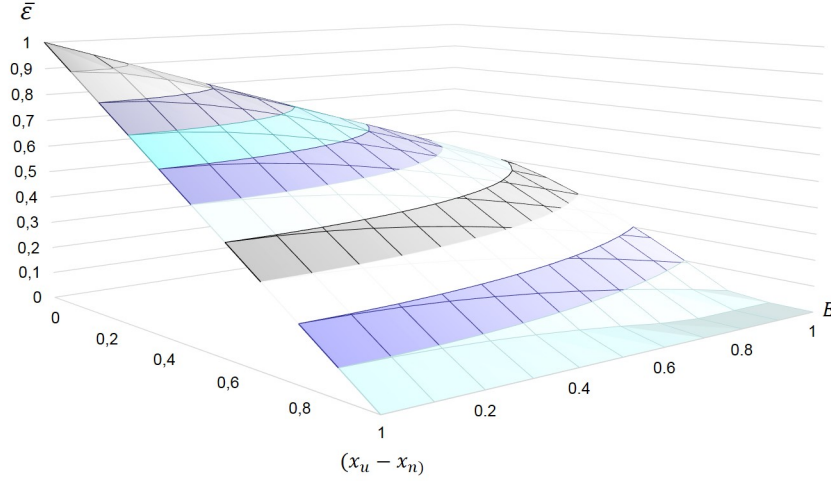


Figure 5: The successor's discretion depending on her attitude and her quality

What determines whether the founder chooses to pass his firm on to his heir or set up a foundation construction? Given a certain successor the founder will choose that alternative which maximises his expected utility. Could it actually be rational for a founder to choose a foundation as succession alternative, an organisation, presumably at odds with standard economics?

As explained earlier, previous economic research mainly focused on the performance of foundation owned firms. The performance is to be expected inferior compared to family owned firms or public companies, since there is no natural owner to control. This rationale is based on a very simplistic agency theory. Therefore it is strange that no formal theoretic analysis, for example in a principal agent model, has been conducted. This paper tries to close this gap by game theoretically analysing a firm succession decision. Previous research attempts to explain the existence of foundations as owners of firms with the following: charity sense of mission (Thomsen, 1999, p.121), tax optimized firm succession Franke and Hermann (1994) or liability reasons (Franke and Draheim, 2015, p. 5). This model tries to explain the existence of foundations as owner of firms with the help of game theoretic modelling and embeds this phenomenon in the catalogue of economic concepts. The passing on of the control over a firm is equal to the delegation of the firms management to future generations. The setting up a foundation and transferring ownership to it means restricting the latter's discretion in order to prevent undesired outcomes. The extent by which the founder interferes with future management depends on his heir's attitude and her quality. The founder will choose a foundation if the expected loss is smaller than in the case of inheritance:

$$EU_u^V > EU_u^S$$

If you look at this consideration graphically, you can easily see that it is rational for the founder to choose a foundation. At a given quality the attractiveness of the foundation solution increases the bigger the conflict of interests between founder and successor.

Assuming a quality of $E = 0.5$ inheritance, contrary to a foundation, becomes less attractive the higher the divergence in preferences. Since in this case quality is relatively high and thus the related risk for an even worse outcome is relatively low, the information advantage of inheritance outweighs the loss of adaptability most of time. Therefore a foundation is only chosen if the conflict of interest between founder and successor is very high ²¹.

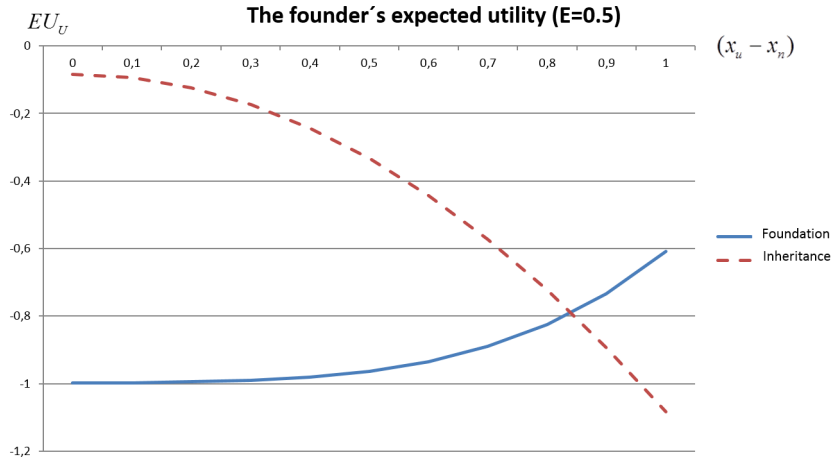


Figure 6: Successor with relatively high quality

By contrast, figure 7 illustrates the founder's consideration if the successor is of lower quality ($E = 1^{22}$). It shows that setting up a foundation as successor becomes more attractive all else equal. The risk of quality related mistakes increases together with the likelihood for unwished outcomes. The restriction of the successor's discretion, by stipulating guidelines, becomes more appealing even it comes at the cost of less adaptability of future management.

In summary the foundation set up becomes more attractive the less suitable the successor. The founder will grant the successor the lesser discretion the lower her quality or the less fitting her attitude. Two things about this are noteworthy. First of all it is shown

²¹Remember, this could be the situation where there is no related successor at all.

²²The numerical values for these illustrations are chosen in order to demonstrate the ongoing effects as obviously as possible. Less bold values would naturally result in the same qualitative effects.

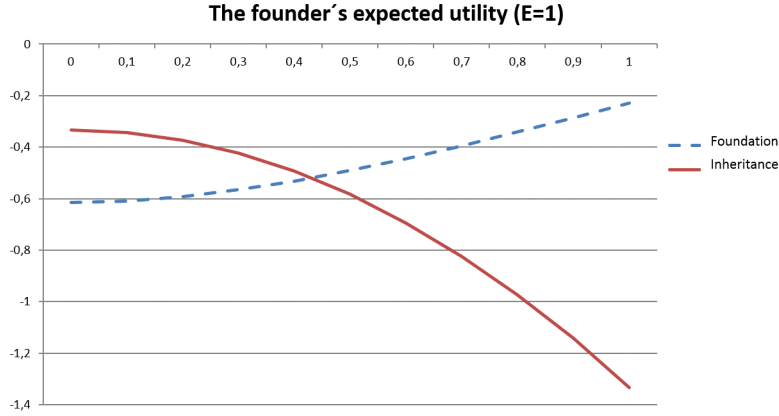


Figure 7: Successor with relatively low quality

that it can be rational to choose a foundation - an owner-less institution- as a successor. And secondly - and this could be even more important- setting up a foundation does not mean automatically a de-personalization of the firm's owner and therefore simplistic agency theory, which served as basis for former research, is insufficient. Therefore, in the light of agency theory setting up a foundation as successor is no binary decision. In other words, a foundation as owner does not result automatically in an severe agency problem. In fact, the agency problem from not having a natural owner depends on the specific foundation-firm-family-arrangement. The more discretion the founder leaves to his successor the less ownership-less the firm is despite the foundation, as it just functions as a safety valve to prevent extreme undesired events from happening.

It is shown in this principal-agent-model that a founder has to trade off information and control. If the founder wants to prevent a certain amount of non-familiar influence he transfers his shares to a foundation depending on the attitude and the quality of the successor ²³.

3 Conclusion

The presented model is the first to analyse game theoretically a firm succession decision with the option to choose a foundation as successor, a form of succession very popular in Central and Northern Europe. More precisely the succession decision is analysed in a delegation model proposed by Holmstrom (1977) and Melumad and Shibano (1991). It is shown that a foundation as successor can be rational, in so far as by setting it up and

²³Logically equivalent the founder could stipulate a certain payout policy. The more suitable his successor the less concrete he will stipulate payout ratios

designing it, the founder can restrict the successors discretion and therefore can prevent specific events from happening, for example the sale of his firm. The model illustrates the basic trade-off a founder faces. In order to keep control he has to sacrifice adaptability of future management.

It is shown that choosing this form of succession can be rational. This depends on the quality and the attitude of the successor. The less suitable the successor the more attractive a foundation as successor becomes. The founder will choose a foundation-firm-family-arrangement that restricts the agents discretion to a greater extent the less talented or willing the agent is. By doing so, the founder has to consider that the preservation of control comes at a cost. Future management becomes less adaptable to changes of environment. This leads to another conclusion: a foundation as owner is not automatically de-personalized or owner-less. Although, depending on the chosen foundation-firm-family arrangement, the founder leaves the control over his firm to his heir, he excludes particular events, like the sale of his company. Thus he can adjust the successor's influence by designing his foundation set up. This could explain a very popular foundation-firm-family construction in Germany, the so called *Doppelstiftung*. This is a horizontal combination of two foundations as a firm's owner, a private foundation and a foundation with a charitable purpose (Pöllath and Richter, 2009, p. 446). The firm's shares are split and dispersed over both foundations whereas both foundations adopt different partner positions. The private foundation, for example a family foundation, only holds a very small share of the firm but holds the majority of voting rights and acts as controlling partner. The charitable foundation on the other hand holds the rest of the shares but does not exercise any control (Pöllath and Richter, 2009, p. 425). By choosing a family foundation the family still acts as a sort of residual claimant and can exert control over the firm. Simultaneously this foundation-firm-family-arrangement is tax-exempt, as the charitable foundation holds most of the shares. And by leaving control to the private foundation this tax-exemption is not risked as commercial activities are prohibited for charitable foundations in Germany (Sänger, 2008, p. 117).

This has two implications for future research. Firstly, the simplistic and never formalised agency theory, on which previous research has been based on, is insufficient. In a principal-agent-model it is shown that it can be rational for a founder to choose a foundation as successor. Thus an inferior performance is not automatically to be expected. Why would a rational founder choose an inferior succession alternative? Future research is needed, since this paper only examines the question of how different foundation-firm-family-arrangement can be explained. Which agency problems arise and how do they

vary over the different foundation set-ups?

Secondly, and this could be even more important, future empirical research has to control for the degree of de-personalization. If the founder can choose his successor's influence by designing the foundation set-up and it is rational for the founder to leave as much discretion as possible to his successor, it is not clear why all foundations should be treated the same empirically. By choosing a purpose and by writing the foundation's charter the founder can determine precisely other's influence on his firm. Proposition 2 of this simple model highlights that the founder will choose this influence depending on his successors suitability. Depending on his successor's quality and attitude he will grant discretion, i.e. the more he can expect her to manage in his favour the more discretion she gets. Franke and Draheim (2015) are the first to control for this. They discriminate firms depending on whether a private or a charitable foundation is the owner. This discrimination is a start, but still does not take into account the full picture as explained above. In summary Franke and Draheim (2015) found out that firms owned by private foundations perform equally to regular family firms. This paper asks: why should not they? Also Franke and Draheim (2015) state that firms owned by charitable foundations perform worse. Following this model a charitable foundation as exclusive owner, assuming that this means the foundation is more de-personalized, is more likely to be chosen the worse the successors promise to be or if there is no successor at all. Furthermore it will lack of adaptability. All in all a worse performance is to be expected. This paper suggests that taking the foundation-firm-family-arrangement into account and therefore controlling for the degree of de-personalization, a better understanding of foundation owned firms can be attained.

For future extensions regarding this presented model one could think of several aspects. As in this model there is only one founder and one successor it would be interesting to analyse this situation with e.g. more than one successor. Potential conflicts and their impacts on the founder's decision could be analysed (Barnes, 1988). Berndt (2004) e.g. argues that foundations as successors become useful if dispute over the heritage is likely. Formally this could be achieved by incorporating the approach of Martimort and Semenov (2006) who consider a delegation problem with one principal and several agents.

In the model presented the successor's ability to take action depends on the succession alternative the founder chooses. But one could also think of a situation where the successor affects a certain attitude knowing that this will maximize her chances for an unrestricted heritage. Once the founder passes away she could reoptimize and manage

the way she wants.

4 Appendix

Proof for proposition 1.

Proof. Proof for Proposition 1:

$$\begin{aligned}\frac{\partial EU_u^V}{\partial(x_n - x_u)} &< 0 \\ \frac{\partial EU_u^V}{\partial E} &< 0\end{aligned}$$

□

Proof. Proof for Proposition 2:

$$\begin{aligned}\frac{\partial \bar{\epsilon}^*}{\partial(x_n - x_u)} &< 0 \\ \frac{\partial \bar{\epsilon}^*}{\partial E} &< 0\end{aligned}$$

□

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