Successful Succession:
Inheritance Tax on Family Firms*

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Abstract. In a number of OECD countries, family firms face lower or no succession taxes if they fulfill continuation requirements. We study the effects of such a preferential treatment in a two-generation model with entrepreneurs and workers. Entrepreneurs have two bequest motives, obtaining utility from joy-of-giving and from the continued existence of their firm (a ‘spirit of capitalism’ motive). They perfectly anticipate their heirs’ continuation decisions and investment behavior. A more favorable inheritance tax treatment of continued firms increases investment, but induces low-ability heirs to continue the firm. Higher inheritance taxes discourage investment even if the firm is sold.

Keywords. Inheritance taxation, family firms, preferential tax treatment, estate taxation

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1 Introduction

Currently, 23 out of 35 OECD countries tax inheritances or estates. In nine of these countries, family firms face lower (or no) succession taxes under certain conditions. Most often, tax rules impose continuation requirements for these firms to be eligible for preferential tax treatment after succession. Inheritance and estate tax reforms in the last decade illustrate the political dynamics in this field. The debate often centers around the negative effect of succession taxes on firm investments. Contrary, treating all wealth equally for reasons of fairness serves as a counter-argument. However, from a theoretical economic perspective, little has been said about whether continued firms should face lower inheritance taxation or not. To answer this question, we look at how the tax treatment influences the behavior of decedents and heirs.

We set up a non-overlapping two-generations model of parents and children. Individuals differ in their ability to run a firm. High-ability parents found a firm and divide their exogenous endowment between consumption and investment in their firm, while perfectly anticipating their children’s behavior. The founder’s ability determines the return on investment. Founders receive utility from own consumption and from bequeathing the firm to their children due to two different bequest motives. First, parents have a joy-of-giving motive (Andreoni, 1990). The second motive follows the ‘spirit of capitalism’ suggested by Weber (1958). Individuals accumulate wealth (here in form of a firm) and leave a bequest to remain influential beyond death by building a financial or industrial dynasty. We assume that the firm must remain in family-hand for this purpose. Low-ability parents work for these firms.

After the first period, founders’ children inherit their parent’s firm and decide whether to sell or continue the firm. Heirs also differ in their ability to run a firm. Whereas high-
ability heirs always continue, the continuation decision by low-ability heirs hinges on the
differential tax treatment in the cases of firm sale and continuation. They only continue
the firm if this is incentivized by tax policy. Taxation hence affects investment in the first
period in two ways. First, it influences investment through the joy-of-giving motive. One
can interpret the tax as the price of bequests, which means that parents invest less in the
case of a higher tax rate because bequeathing becomes more expensive. Second, the tax
influences the heirs’ continuation decision which influences investment through the ‘spirit
of capitalism’ motive. Parents only receive utility from this motive if the firm remains in
family-hand. Therefore, investing becomes less attractive if the firm will be sold by the
heir.

In this paper, we aim to find the welfare-maximizing design of the inheritance tax instru-
ments. For this purpose, we introduce a governmental planning problem with the optimal
tax rate and optimal preferential treatment for continued firms as instruments.

This paper contributes to the literature on optimal estate and inheritance taxation. A
number of papers have studied the optimal design of taxes imposed on intergenerational
transfers (e.g. Piketty and Saez, 2013; Farhi and Werning, 2010, 2013; Kopczuk, 2013),
but the case of inherited family firms has received little attention so far. Grossmann and
Strulik (2010) propose a first model to analyze the desirability of preferential estate tax
treatment for continued firms. The key trade-off in their model is between transaction
cost by firm sales after succession and efficiency cost induced by firm continuation by
low-ability heirs.

Incentivizing low-ability heirs to manage the firm by preferential tax treatment leads to
productivity effects. Empirical studies suggest that family successions negatively impact
firm performance. Bennedsen et al. (2007) find a negative causal effect of family transitions
on the operating profitability on assets for Danish data. Pérez-González (2006) shows similar effects using data on individual CEOs. Using Fortune 500 data, Villalonga and Amit (2006) find that firm value decreases when second generation descendant-CEOs are in office. In a sample of medium sized firms, bad management practices that are closely connected to lower profitability are more prevalent if the eldest son takes over according to a study by Bloom and Van Reenen (2007).

Further empirical work studies the effects of inheritance taxes on investment and liquidity-forced sales. Tsoutsoura (2015) exploits a natural experiment setting from Greece where taxation on intrafamily succession was reduced in 2002. The study finds a strong negative effect of succession taxes on investment. Brunetti (2006) studies the effect of a decrease in US estate tax rates on business sales. The author finds a small positive effect of the tax on business sales, but cannot show that the effect is driven by liquidity problems. Entrepreneurs could prevent liquidity-forced sales by taking advantage of life insurances. In earlier work, Holtz-Eakin et al. (2001) however find that entrepreneurs use this opportunity only insufficiently. In addition, several countries offer the possibility to defer the tax payment in order to prevent firms from liquidity problems. For this reason, we neglect liquidity issues in our model.

The paper proceeds as follows. Section 2 presents the model. Section 3 analyzes the optimal inheritance tax policy. Section 4 concludes.
2 Model Framework

2.1 General Set-up

We consider an economy with dynasties of two generations, namely parents and children. All parents live only in period \( t = 1 \) and have exactly one child; all children live only in period \( t = 2 \). Individuals either have a high ability, \( \bar{\gamma} \), or a low ability, \( \bar{\gamma} \), to run a firm with \( \bar{\gamma} > \gamma > 1 \).

In the parents' generation, all individuals with a high ability found a firm. We call these individuals founders \( F \) with ability \( \bar{\gamma}_F = \bar{\gamma} \). Their children are heirs \( H \in \{H, \bar{H}\} \) with \( H \) denoting low-ability heirs \( (\gamma_H = \gamma) \) and \( \bar{H} \) denoting high-ability heirs \( (\gamma_{\bar{H}} = \bar{\gamma}) \). In the parents' generation, all individuals with a low ability are workers \( W_1 \). Their low-ability children are workers \( W_2 \) \( (\gamma_{W_2} = \gamma) \), whereas their high-ability children are potential buyers \( B \) \( (\gamma_B = \bar{\gamma}) \) of a firm. Figure 1 illustrates the different types of individuals.

![Diagram of Types of Individuals](image)

Figure 1: Types of Individuals.

The number of founders \( (n_F) \) and the number of workers \( (n_{W_1} = 1 - n_F) \) are exogenously given and normalized to a sum of one. We assume that managerial ability can be inherited to a certain extent. Following Caselli and Gennaioli (2013), we model the probability that
a founder’s heir inherits the founder’s high ability as

\[ p_H = n_F + \rho(1 - n_F) \]  

(1)

and the probability that a worker’s child inherits the worker’s low ability as

\[ p_{W_2} = n_{W_1} + \rho(1 - n_{W_1}), \]  

(2)

where \( 0 < \rho < 1 \) is a correlation coefficient. Accordingly, the probability to have low ability as a founder’s child is \( p_H = 1 - p_H \) and the probability to have high ability as a worker’s child is \( p_B = 1 - p_{W_2} \). These probability functions make sure that ability follows a stationary distribution, i.e. the share of high-ability and low-ability individuals is the same in both generations. The number of high-ability heirs \( (n_H) \), low-ability heirs \( (n_L) \), potential buyers \( (n_B) \) and second-generation workers \( (n_{W_2}) \) add up to one. Due to the design of the probability functions, the number of low-ability heirs equals the number of potential buyers for any \( \rho \) and any distribution of types in the first generation.\(^1\)

Founders divide their endowment between consumption and investment in their firm. They receive utility from consumption, from bequeathing the firm to their children due to a joy-of-giving bequest motive and from their firms’ values at the end of the model world due to a spirit of capitalism motive. Founders leave bequests to remain influential beyond death by building financial or industrial dynasties. It is hence in their interest to maximize the firm’s anticipated value at the end of period 2. Workers receive an exogenous wage \( Y_{W_1} \) and receive utility only from own consumption.\(^2\)

\(^1\)When low-ability heirs decide to sell their inherited firms later in this model, this makes sure that each firm can be bought by a type \( B \) individual.

\(^2\)For reasons of simplicity, we do not model the labor market for workers. You can think of them as having the outside option to work in a different sector with publicly traded non-inherited firms.
After period 1, heirs inherit the firm, pay the inheritance tax liability and decide whether to continue the firm or not. We assume that high-ability types always continue whereas the decision by low-ability types depends on whether continued firms receive a preferential inheritance tax treatment compared to sold ones. \( \tau \in \{ \tau^c, \tau^s \} \) is the inheritance tax rate. \( \tau^c \) applies to continued firms, \( \tau^s \) applies to sold firms. The government redistributes the tax revenue in form of lump-sum transfers \( T \) to all individuals at the beginning of the second period.

If a heir decides to sell, a buyer \( B \) will buy the firm. If a heir decides to continue the firm, he will divide the lump-sum transfer between consumption and investment to maximize utility. Heirs receive utility from consumption and their firms’ values after period 2. Parents know their children’s abilities and base their investment decisions on this knowledge. Therefore, parents can perfectly anticipate their children’s continuation and investment decisions. The binary variable \( D_H \in \{0, 1\} \) indicates whether heir \( H \) will continue the firm (1) or not (0). Conditional on \( D_H \), a firm’s value after period 1 is

\[
V_1^H (\gamma_F, I_F^H(D_H)) = \gamma_F \cdot I_F^H(D_H). \tag{3}
\]

It is a function of the founder’s ability \( \gamma_F \) and investment \( I_F^H(D_H) \), which again is a function of the child’s ability type and continuation decision. The founder’s ability reflects the return on invested capital. The firm’s value equals the firm’s capital, which is the sum of invested capital and profit. This reflects a very simplified production function where labor input is set to 1 and is provided by the firm’s owner. Also, capital does not depreciate. \( V_1^{H,c} \) denotes the firm’s value after period 1 if the heir will continue the firm (which is correctly anticipated by the founder), \( V_1^{H,s} \) denotes the firm’s value if the heir will sell the
The firm’s value after period 2 is

\[ V_2^H (\gamma_F, \gamma_H, I_F^H(D_H), I_H) = \gamma_H \cdot (\gamma_F \cdot I_F^H(D_H) + I_H) \tag{6} \]

if \( H \) has run the firm in period 2, and

\[ V_2^B (\gamma_F, \gamma_B, I_F^H(D_H = 0), I_B) = \gamma_B \cdot (\gamma_F \cdot I_F^H(D = 0) + I_B) \tag{7} \]

if \( B \) has run the firm in period 2. The firm’s manager generates a return on initial capital (first term) and on newly invested capital \( I_B \) or \( I_H \) (second term). Since \( B \) only runs a firm if the original heir sells one, invested capital is \( I_F^H(D_H = 0) \) in this case. It denotes the founder’s investment if he anticipates that \( H \) will discontinue the firm.

The model proceeds in four stages. First, the government sets tax rates \( \tau^c \) and \( \tau^s \) optimally. Second, founders choose consumption and investment while knowing tax rates and anticipating their children’s behavior. Third, heirs of a firm decide whether to continue the firm or sell it to a buyer \( B \). Fourth, heirs (and buyers) choose consumption and investment. We now solve the model by backwards induction.

### 2.2 Stage 4: Heirs’ Investment and Consumption Decision

In the last stage, we have to distinguish two cases:
1. High-ability and low-ability type continue firm \((D_H = D_H = 1)\),

2. High-ability type continues firm, low-ability type sells firm \((D_H = 1, D_H = 0)\).

**Case 1.** Heirs face the optimization problem

\[
\max_{C^c_{\bar{H}}, I_{\bar{H}}} U^c_{\bar{H}} = \alpha \sqrt{C^c_{\bar{H}}} + \left( V^H_{2} - \tau^c V^H_{1,c} \right)
\]

\[\text{s.t. } T \leq C^c_{\bar{H}} + I_{\bar{H}}, \]

where \(\alpha > 0\) is a preference parameter. Heirs receive utility from consumption \(C^c_{\bar{H}}\) and the firm’s value after period 2. They divide their transfer income \(T\) between consumption and investment. The tax liability incurs at the beginning of period 2, but the government allows to defer the payment to the end of period 2.\(^3\) Optimal consumption and investment is

\[C^c_{\bar{H}}^* = \frac{\alpha^2}{4 \gamma^H_{\bar{H}}} \quad \text{and} \quad I^c_{\bar{H}}^* = T - \frac{\alpha^2}{4 \gamma^H_{\bar{H}}}. \quad (9)\]

Optimal investment is higher for high-ability heirs than for low-ability heirs. We denote indirect utility by \(v^c_{\bar{H}}\). Since both types of heirs continue running their firms, potential buyers \(B\) and workers \(W_2\) just consume their labor income \(Y_B = Y_{W_2}\) and the lump-sum transfer, i.e.

\[U^c_B = U_{W_2} = \alpha \sqrt{C^c_{B}} = \alpha \sqrt{Y_B + T}. \quad (10)\]

**Case 2.** The optimization problem of \(\bar{H}\) is as in case 1. \(H\) now sells the inherited firm and consumes the sum of labor income, transfer and selling price less inheritance tax payment.

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\(^3\)In several countries, we observe the possibility to defer the tax payment in order to prevent firms from liquidity problems.
The utility function is

\[ U_B^s = \alpha \sqrt{C_B^s} = \alpha \sqrt{Y_H + T + (1 - \tau_s)V_1^{H,s}}. \]  

(11)

Buyers \( B \) buy the firms from low-ability heirs and divide the transfer income between consumption \( C_B^s \) and investment \( I_B^s \). Buyers can borrow the purchasing price interest-free and pay back at the end of period 2. The optimization problem is

\[
\max_{C_B^s, I_B^s} U_B^s = \alpha \sqrt{C_B^s} + \left( V_B^2 - V_1^{H,s} \right)
\]

s.t. \( T \leq C_B^s + I_B^s \).

(12)

Optimal consumption and investment is

\[
C_B^{s,*} = \frac{\alpha^2}{4\gamma_B^2} \quad \text{and} \quad I_B^{s,*} = T - \frac{\alpha^2}{4\gamma_B^2}.
\]

(13)

Since \( \gamma_B = \gamma_H = \bar{\gamma} \), buyers invest as much as high-ability heirs do. We denote indirect utility by \( \upsilon_B^s \).

Workers \( W_2 \) consume in both cases exogenous labor income \( Y_{W_2} \) and transfer income. Their utility is

\[ U_{W_2} = \alpha \sqrt{C_{W_2}} = \alpha \sqrt{Y_{W_2} + T}. \]

(14)

2.3 Stage 3: Heirs’ Continuation Decision

In this stage, heirs decide between continuing and selling the inherited firm. Since we assume that high-ability types always continue, this stage only applies to low-ability
types. They continue if
\[ v^c_H > U^s_H. \] (15)

We assume that condition (15) is fulfilled if and only if \( \tau^c < \tau^s \). Consequently, case 1 occurs if continued firms are preferentially treated and case 2 occurs otherwise.

2.4 Stage 2: Founders’ Investment and Consumption Decision

Founders know their children’s abilities and they perfectly anticipate the heirs’ decisions in stages 3 and 4.

Case 1. High-ability and low-ability heirs continue the firm. Founders solve the optimization problem

\[
\max_{C^{H,c}_F, I^{H,c}_F} U^{H,c}_F = \alpha \sqrt{C^{H,c}_F + \beta (1 - \tau^c) V^{H,c}_1} + D_H V^H_2
\]
\[ \text{s.t. } Y_F \leq C^{H,c}_F + I^{H,c}_F, \]

(16)

where \( \beta > 0 \) is a preference parameter. Founders divide their income \( Y_F \) between consumption \( C^{H,c}_F \) and investment \( I^{H,c}_F \) in their firm. The second term in the utility function is the net-of-tax bequest, i.e. the net-of-tax firm value, given to the child. It reflects the joy-of-giving bequest motive. The third term in the utility function is the firm value at the end of period 2 given that the firm is still family owned \((D_H = 1)\). It reflects the spirit of capitalism bequest motive. Optimal consumption and investment are

\[
C^{H,c,*}_F = \frac{\alpha^2}{4 [\beta (1 - \tau^c) \gamma_F + \gamma_F \gamma_H]^2} \quad \text{and} \quad I^{H,c,*}_F = Y_F - \frac{\alpha^2}{4 [\beta (1 - \tau^c) \gamma_F + \gamma_F \gamma_H]^2}. \] (17)

Optimal investment decreases with an increasing tax rate since it reduces the net-of-tax
bequest available to the heirs. Contrary, optimal investment increases with increasing ability of the heir, which enters through the spirit of capitalism motive. A high ability of the heir makes investing more worthwhile since initial investment will be used more productively in the second period which increases the firm’s value at the end of period 2. We denote indirect utility by \( u_{F}^{H,c} \).

**Case 2.** Only high-ability heirs continue the firm. Low-ability heirs sell the firm to \( B \). Founders with a high-ability child solve the same optimization problem as in case 1. Founders with a low-ability child solve the optimization problem

\[
\max_{C_{F}^{H,s}, I_{F}^{H,s}} U_{F}^{H,s} = \alpha \sqrt{C_{F}^{H,s} + \beta (1 - \tau^{s})V_{1}^{H,s}} + D_{H}V_{2}^{H}
\]

s.t. \( Y_{F} \leq C_{F}^{H,s} + I_{F}^{H,s} \).

Optimization problems only differ in the applicable tax rate and the value of \( D_{H} \), which is 1 in case 1 and 0 in case 2. Since the firm is not family-owned in period 2 in case 2, parents do not receive utility from the spirit of capitalism motive. In this case, optimal consumption and investment are

\[
C_{F}^{H,s,*} = \frac{\alpha^2}{4\beta^2(1 - \tau^{s})^2\gamma_{F}} \quad \text{and} \quad I_{F}^{H,s,*} = Y_{F} - \frac{\alpha^2}{4\beta^2(1 - \tau^{s})^2\gamma_{F}^2}.
\]

The tax rate only enters the optimal investment function through the joy-of-giving bequest motive. A higher tax rate leads to lower investment and higher consumption instead. We denote indirect utility by \( u_{F}^{H,s} \).

Workers \( W_{1} \) consume in both cases exogenous income \( Y_{W_{1}} \). Their utility is

\[
U_{W_{1}} = \alpha \sqrt{C_{W_{1}}} = \alpha \sqrt{Y_{W_{1}}}.
\]
Proposition 1 (Effect of Inheritance Tax on Founders’ Investment Decision)

A higher inheritance tax rate implies less investment by the founder. This effect is stronger if the heir continues the firm, although if the heir continues the firm, the level of investment is higher. A stronger preferential treatment of continuation can imply that low-ability heirs continue the firm. If this is the case, investment by the founder increases.

Proof. Follows from comparing (17) and (19), and the derivatives $\frac{\partial I^H_{H,s},c^*}{\partial \tau^c}$ and $\frac{\partial I^H_{H,c},c^*}{\partial \tau^c}$. 

To summarize, founders’ investments differ across cases. If both types of heirs will continue the firm, differences in investment arise from heterogeneity in heirs’ abilities. It holds that

\[ I^H_{H,c},c^* > I^H_{H,c},c^* \text{ with } \frac{\partial I^H_{H,c},c^*}{\partial \tau^c}, \frac{\partial I^H_{H,c},c^*}{\partial \tau^c} < 0. \]  

A lower tax rate $\tau^c$ reduces the price of bequeathing in both case and hence encourages investment. If low-ability heirs will sell the firm, their parents invest $I^H_{F,s},s^*$, which decreases for increasing $\tau^s$. For $\frac{1-\tau^s}{1-\tau^c} < \gamma$, it holds that

\[ I^H_{F,c},s^* > I^H_{F,c},s^* > I^H_{F,s},s^*. \]  

This means that investment is always lower if heirs are expected to sell as long as continued firms receive some preferential tax treatment or pay the same tax as sold firms.

2.5 Stage 1: The Government’s Optimization Problem

The government sets $\tau^c$ and $\tau^s$ while perfectly anticipating founders’ and heirs’ decisions. We examine whether the government can improve welfare by differentiating tax rates,
i.e. by optimally influencing the binary variable $D_H$. By setting $\tau^c < \tau^s$ the government makes low-ability types continue their firms. The government maximizes the Utilitarian welfare criterion

$$\Phi = \left[ n_H v_{H,c}^F + n_H \left( D_H v_{F}^{H,c} + (1 - D_H)v_{F}^{H,s} \right) + n_{W_1} U_{W_1} \right]$$

$$+ \delta \left[ n_H v_{H}^c + n_H \left( D_H v_{H}^c + (1 - D_H)v_{H}^s \right) + n_B \left( D_H U_B^c + (1 - D_H)v_{B}^s \right) + n_{W_2} U_{W_2} \right],$$

where $0 < \delta < 1$ is a generational discount factor. The expression in the first line sums up the mass-weighted utilities of founders and workers in the first generation. Depending on whether low-ability heirs will continue their inherited firms or sell them, the utility of founders with a low-ability child is either $v_{H,c}^F$ or $v_{H}^s$, respectively. The expression in the second line sums up the mass-weighted utilities of the four groups of individuals in the second generation. Low-ability heirs’ utility is $v_{H}^c$ if they continue the firm and $v_{H}^s$ if they sell the firm. Potential buyers’ utility is $U_B^c$ if they have to work because low-ability types are not willing to sell their firms and $v_{B}^s$ if they buy firms.

**Case 1.** High-ability and low-ability heirs continue the firm since $\tau^c < \tau^s$. With $D_H = 1$ the planning problem becomes

$$\max_{\tau^c} \Phi = \left[ n_H v_{H,c}^F + n_H \left( D_H v_{F}^{H,c} + (1 - D_H)v_{F}^{H,s} \right) + n_{W_1} U_{W_1} \right]$$

$$+ \delta \left[ n_H v_{H}^c + n_H \left( D_H v_{H}^c + (1 - D_H)v_{H}^s \right) + n_B \left( D_H U_B^c + (1 - D_H)v_{B}^s \right) + n_{W_2} U_{W_2} \right].$$

(24)

**Case 2.** Only high-ability heirs continue the firm since $\tau^c \geq \tau^s$. With $D_H = 0$ the planning problem becomes

$$\max_{\tau^c, \tau^s} \Phi = \left[ n_H v_{H,c}^F + n_H \left( D_H v_{F}^{H,c} + (1 - D_H)v_{F}^{H,s} \right) + n_{W_1} U_{W_1} \right]$$

$$+ \delta \left[ n_H v_{H}^c + n_H \left( D_H v_{H}^c + (1 - D_H)v_{H}^s \right) + n_B \left( D_H U_B^c + (1 - D_H)v_{B}^s \right) + n_{W_2} U_{W_2} \right].$$

(25)
3 Simulation

Since the government’s optimization problem cannot be solved analytically, we uncover determinants of optimal tax policy by using a simulation approach. In this chapter, we present selected simulation results and explain the intuition behind them. These results show interesting mechanisms but do not aim to suggest specific tax rates.

[to be added]

4 Conclusion

We set up a non-overlapping two-generations model of parents and children, where each individual can either have a high or a low ability to run a firm. Founders receive utility from own consumption and from bequeathing the firm to their children due to two different bequest motives. First, parents have a joy-of-giving motive. Second, there is a ‘spirit of capitalism’ motive. Heirs can either continue or sell the firm, depending on their ability and the tax treatment. Whereas high-ability heirs always continue, the continuation decision by low-ability heirs hinges on the differential tax treatment in the cases of firm sale and continuation. Taxation hence affects investment in the first period in two ways. First, it influences investment through the joy-of-giving motive. One can interpret the tax as the price of bequests. Second, the tax influences the heirs’ continuation decision which influences investment through the ‘spirit of capitalism’ motive.

As a next step, we plan to solve for the welfare-maximizing tax policy of our model (if analytically possible) or to use a simulation approach. We thus aim to contribute to the policy discussion on inheritance taxation, where the tax treatment of business assets is a much-discussed question.


References


