

Inside the Family Firm

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**INSIDE THE FAMILY FIRM:
The Role of Families in Succession Decisions and Performance**

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**Inside the Family Firm:
The Role of Families in Succession Decisions and Performance** *

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This paper uses a unique dataset from Denmark to investigate (1) the role of family characteristics in corporate decision making, and (2) the consequences of these decisions on firm performance. We focus on the decision to appoint either a family or an external chief executive officer (CEO). We show that a departing CEO's family characteristics have a strong predictive power in explaining CEO succession decisions: family CEOs are more frequently selected the larger the size of the family, the higher the ratio of male children and when the departing CEOs had only had one spouse. We then analyze the impact of family successions on performance. We overcome endogeneity and omitted variables problems of previous papers in the literature by using the gender of a departing CEO's first-born child as an instrumental variable (IV) for family successions. This is a plausible IV as male first-child family firms are more likely to pass on control to a family CEO than female first-child firms, but the gender of the first child is unlikely to affect firms' performance. We find that family successions have a dramatic negative causal impact on firm performance: profitability on assets falls by at least 6 percentage points around CEO transitions. These estimates are significantly larger than those obtained using ordinary least squares. Finally, our findings demonstrate that professional non-family CEOs provide extremely valuable services to the organizations they work for.

JEL classification: G32, G34, M13

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Family firms have gained increasing attention in the finance and economics literatures as recent work has documented that founders and their families are often the dominant owners in publicly traded corporations. Given the prevalence of family firms, it is not surprising that a growing body of work has explored their impact on firm performance, often with mixed results.¹

Yet to this date, we know little about the specific mechanisms through which family firms affect performance or about the precise roles played by the families behind these firms.² As a result, it is hard to identify the distinctive features of family firms that differentiate them from other corporations with concentrated ownership.³

The objective of this paper is to shed light on two questions. First, do family characteristics affect firm decisions? Family heterogeneity might be fundamental to understand the role of families in these decisions. Second, if family characteristics indeed affect firms' decision-making, what are the consequences of these decisions on firm performance?

We evaluate these two questions in the context of firms' top management succession decisions. At succession, family firms face the often tough decision of hiring a family or an unrelated chief executive officer (CEO). We analyze CEO transitions because succession decisions are likely to play a key role in determining the survival of firms and because this decision is likely to be influenced by the preferences of the controlling family, as arguably family firms tend to prefer family CEOs.

¹ On the prevalence of family firms, see La Porta et al. 1999; Morck, et al., 2000; Claessens et al. 2002; Faccio and Lang, 2002; Anderson and Reeb, 2003; Pérez-González, 2003; Villalonga and Amit, 2004. On the performance of family firms, see Morck et al. 1988a and 1988b; Yermack, 1996; McConaughy et al. 1998; Morck et al. 2000; Anderson and Reeb, 2003; Pérez-González, 2003; Villalonga and Amit 2004; Sraer and Thesmar (2004); Ehrhardt et al (2005).

² Some exceptions include Pérez-González (2003) who provides evidence on nepotism in CEO appointments in U.S. family firms and Bertrand et al. (2005) who explore the consequences of sibling rivalry in family firms in Thailand.

³ For the impact of large shareholders in general see Shleifer and Vishny (1986 and 1997).

Using a unique dataset from Denmark that contains information on all limited liability firms in the country, we show that family characteristics have a strong predictive power in explaining both, the decision to hire a family or an unrelated CEO, as well as the choice of the family member who receives the top post.⁴

We find that family CEOs are more frequently selected the larger the size of a departing CEO's family, the higher the fraction of sons in the departing CEO's children and when the departing CEO had only had one spouse. The magnitudes of the changes in the probability of observing a family succession attributable to these variables are very large. For example, firms where the departing CEO had three children were 7.4 percentage points —25 percent— more likely to undergo a family succession than firms where the departing CEO had only one child. More surprisingly, family successions declined from 33.7 percent for cases where the departing CEO had only one spouse to 24.6 percent in firms where the departing CEO had a history of multiple spouses, a decline of 27 percent.

Family structure also affects who gets the top post among members of the family behind the family firm. In particular, there is a strong preference for children relative to spouses, parents or siblings in family successions. Comparing firms where the departing CEO had no children to those where she or he had only one child, we find that the fraction of firms that pass on control to children increases by 9.4 percentage points while the fraction of other relatives who get the top post declines by 5.1 percentage points.

Having established that family characteristics affect firms' succession decisions, we then explore the consequences of these family successions on firm performance. Given that family as well as firm characteristics are likely to be endogenous, we examine this question using instrumental variables (IV).

⁴ Herein we refer to family characteristics as the family characteristics of the departing CEO and we define an incoming CEO as *family* when the departing and incoming managers are related by blood or marriage and as *unrelated*, if not.

We instrument for family successions using the gender of the first-born child of a departing CEO. The gender of the first child is a plausible instrument for family successions because it affects the probability of observing a family CEO and because it is unlikely to be correlated with firm performance.

Our evidence indicates that the gender of the first-born child of a departing CEO is strongly correlated with the decision to appoint a family CEO: the frequency of family transitions is 28.6 percent when the first-born child is female and it increases more than 7 percentage points to 35.7 percent (a 24.8 percent increase) when he is male. This difference is statistically significant at the one-percent level.

We also document that prior to succession decisions, firms' profitability, age, and size do not differ statistically as a function of the gender of the first child. These results indicate that it is unlikely that the gender of the first child affects firm performance beyond their impact on who is promoted to the CEO position.

Our main finding is that family successions are significantly negatively correlated with changes in firm performance around CEO successions. The relationship between family successions and firm performance is extremely strong: family CEOs cause an average decline in firm profitability on assets of at least 6 percentage points.

We then compare our results to those obtained using a difference-in-differences (DD) approach. We show that DD estimates provide robust empirical support for the notion that family successions hurt performance, yet the estimated coefficient on the negative effect of family CEOs is significantly lower than the one found using IVs. We posit that our results point to an important bias in OLS estimates, as family CEOs are more likely to be promoted to the helm of corporations when firms' prospects are positive. We also test for differences in pre or post-CEO transition changes in performance and we fail to find significant differences across groups in periods where CEO transitions do not occur, bolstering the case for the causal interpretation of our findings.

We examine whether industry characteristics that might be associated to differential costs of employing a “professional” rather than a family CEO affect our findings. Presumably, managerial skills are more valuable in rapidly changing or innovative economic environments. We find that family CEOs tend to be costlier in fast growing industries, in sectors with significant firm entry, as well as in environments with relatively higher levels of research and development.

An alternative way to interpret our analysis is that it provides a clean test of the direct effect of professional CEOs on firm performance. An ideal laboratory to test professional CEOs’ worth would be to randomly assign individuals from the general population and professional managers to the CEO position, and then compare their outcomes. This is close to what the instrumental variables estimator does: it compares the performance of firms with an unrelated CEO to the performance of firms that promote a family member only because the departing CEO’s first-born child was male. If unrelated CEOs were valuable, then the performance of the former firms should exceed the latter, which is indeed what we find. Professional CEOs seem to provide extremely valuable services to the organizations they work for.

An additional advantage of our empirical approach is that we do not need to take a stand on which firms are family firms and which others are not, a common source of debate in the literature. We allow the data to identify the firms where family characteristics, such as, the gender of a first child, have a bearing on succession decisions.

Our focus on the interaction between family characteristics and economic decisions relates to the seminal work of Becker (1991), and to the large body of work in economics that links the gender of offspring to various economic decisions (see for example, Angrist and Evans, 1998; Angrist and Krueger, 1999; Dahl and Moretti, 2004, Bertrand et al 2005, among others). Our evidence that family succession decisions favor first-born males is consistent with fathers’ preference for boys in other settings (Dahl and Moretti, 2004). Yet parental preference over male children would presumably predict higher family involvement and superior performance when first-male children are in control, which is not supported empirically.

Overall, our results cast doubt on the benefits of promoting a CEO from within the ranks of the controlling family of a corporation. These findings are important for the governance of both public and private firms around the world. Controlling families that enjoy the private benefits of control might select a family CEO even when performance is negatively affected as a result. Other stakeholders, from minority shareholders to creditors or workers, might not share in these benefits and would therefore be negatively affected by family successions.

The rest of the paper is as follows. The next section summarizes prior work on the role of founders and their families. Section II describes the data and presents summary statistics. Section III outlines our empirical strategy. Section IV presents the results and Section V concludes.

I. Existing Literature

Family and Family-Heir Firms: Prevalence and Performance

Demsetz and Lehn (1985) and Shleifer and Vishny (1986) have previously shown that the Berle and Means (1932) corporation with separated ownership and control is, in practice, not widespread. Even in the United States, families own and control a significant number of publicly held firms. Family ownership (founders and descendants) is present in 35 (37) percent of firms in the Standard and Poor's (Fortune) 500, where families hold an average of 18 (16) percent of shares (Anderson and Reeb, 2003; Villalonga and Amit, 2004).

Outside the United States, evidence of ownership concentration by La Porta et al. (1999) indicates that families control over 53 percent of publicly traded firms with at least \$500 million in market capitalization in 27 countries. Additional evidence of the prominent role of families in public firms is provided by Morck et al. (2000) for Canada, Claessens et al. (2002) for East Asian countries, and Faccio and Lang (2002) for Western Europe. The role of families in privately held firms is, presumably, even larger.

From a theoretical perspective it is unclear whether family CEOs should have a positive impact on firm performance (Donnelley, 1964). For example, family members could perform better than other CEOs because they face steeper incentive schemes: In addition to monetary rewards, they derive significant personal satisfaction from the success of the organization (Davis, et al. 1997; Palia and Ravid, 2002) and face higher levels of shame or guilt in case of failure (Kandel and Lazear, 1992). Also, the trust and loyalty established with key stakeholders might be more easily transferred to family executives (Donnelley, 1964). An additional benefit of family members is that, by virtue of having grown up close to the day-to-day business of the organization, they might be more knowledgeable than outsiders about the firm (Donnelley, 1964).

However, there are also strong reasons to believe that family CEOs might deliver worse performance than professional managers (Christiansen, 1953; Kepner, 1983). First, outsiders are a self selected group of individuals with significant managerial expertise and presumably, with an established record on their competence (Pérez-Gonzalez, 2003). Second, family CEOs, even if competent, might be affected by the potential conflicts between family and business norms with regard to the allocation of management positions, executive pay or other resources (Levinson, 1971; Barnes and Hershon, 1976; Lansberg, 1983).

To date, several studies have empirically examined the impact of founders and their families on performance. Regarding the role of founders, Johnson, et al. (1985) find that sudden deaths of founder-CEOs are associated with large stock price increases, which suggests that founder CEOs hindered performance. Yet, Slovin and Sushka (1993), in analyzing deaths of large shareholders, find that founder status does not have a significant effect in explaining abnormal returns. They do, however, find that the death of CEOs with concentrated ownership is associated with positive abnormal returns and with substantial subsequent control activity, which is consistent with entrenchment.

Yermack (1996) finds that founding family CEOs are negatively correlated with market to book (M-B) ratios. In contrast, other studies find a positive impact of founder-CEOs. McConaughy et al. (1998) find a positive impact of founding family CEOs on M-B ratios. Anderson and Reeb (2003) find a positive correlation between founding family ownership and profitability and M-B ratios, and conditional on family ownership, a positive correlation between these measures and family CEOs. Adams et al. (2003) instrument for the presence of founder CEOs using the number of founders alive and find a positive founder effect on performance.

More related to our paper is the literature that evaluates the impact of family heirs on firm performance. Morck et al. (1988) find a positive and significant correlation between founding family management and market to book (M-B) ratios for young firms (where the founder is more likely to be in charge) but a negative correlation for old firms in their sample (where heirs are more likely to be CEOs). In their sample of Canadian firms, Morck et al. (2000) find lower operating performance for family CEOs who inherit their positions. Pérez-González (2003) finds drastic declines in M-B and firm profitability around successions when family members but not unrelated executives take control. Villalonga and Amit (2004) find that founding families enhance M-B valuations only when founders are active in the corporation but hurt valuations in descendant CEOs firms. Bloom and Van Reenen (2005) find that family firms under the management of a first-born male in France, Germany, Great Britain and the United States are negatively correlated to “best” managerial practices. In contrast, Sraer and Thesmar (2004) find a positive correlation between heir-controlled firms and profitability in France.

A common drawback of profitability or M-B based tests on heir or family performance is that family status is not randomly determined, and as a result, inference is problematic. Our paper improves on this literature by using an instrumental variable approach that allows us to alleviate endogeneity and omitted variable concerns.

The Role of the Family behind the Family Firm

Given the prevalence of family firms and their alleged effects on performance, it is surprising how little we know about the specific mechanisms behind these correlations and especially how they interact with the controlling family characteristics. There are, however, a few exceptions.

Pérez-González (2003) shows a strong correlation between the decline in performance in family-heir managed firms and the quality of the undergraduate institution attended by family CEOs. In particular, he finds large declines in performance for firms with a family CEO that attended relatively “non-selective” undergraduate institutions. Further, he finds no such an effect in the pool of unrelated managers. His findings show that nepotism might be at the core of the difference in performance. Also, given that he explores changes in performance, his results are robust to time-invariant firm characteristics that might affect the relative performance of family CEOs. Yet his empirical strategy might not distinguish between heir attributes (college attended) and unobserved changes in performance that could correlate with the choice of CEO.

An alternative approach to explore the impact of families on firm performance that might be less prone to the omitted variables and endogeneity concerns is to use family characteristics as a source of variation. In this regard, Bertrand et al. (2005) show a negative correlation between firm profitability and the number of male descendants, which is potentially explained by sibling rivalry. An important shortcoming of this approach is that it implicitly assumes that family traits are exogenous to firms’ outcomes. However, there is a large literature showing that family characteristics are also choice variables that respond to economic circumstances (Becker, 1991).

In the remaining sections we examine the role of families’ characteristics on CEO succession decisions and then evaluate the consequences of family successions on firm performance. We extend on existing work on the effect of family characteristics on decision-

making by focusing the bulk of our empirical analysis on family characteristics that are likely to be exogenous to firms' characteristics. We also improve on the literature on the performance effects of family relative to unrelated successions by using these exogenous family characteristics as instrumental variables. Our data and empirical strategy are explained in the following sections.

II. Data Description and Summary Statistics

II.A. Data Sources and Sample Selection

We constructed a dataset with 9,511 successions in limited liability (publicly and privately held) firms in Denmark between 1994 and 2002. Our dataset contains financial information on firms, as well as personal and family information about the departing and incoming chief executive officers. This dataset was constructed based on three different sources as explained below:

Financial and management information are from *Købmandsstandens Oplysningsbureau* (KOB). KOB is a dataset assembled by a private firm (with the same name) based primarily on the annual reports that all limited liability firms are required to file with the Danish Ministry of Economic and Business Affairs. The dataset contains selected accounting and management information of the universe of limited liability companies in Denmark. Local regulations mandate disclosure of firms' assets and measures of firm profitability such as operating or net income, yet to protect firms' market position they do not require them to report sales. Management data reported includes the names and position of executives and board members. We obtained access to management information from 1994 to 2002 and financial data from 1991 to 2003. Even though a large fraction of KOB firms are privately held, KOB data are likely to be reliable as Danish corporate law requires annual reports to be approved by external accountants.

Individual and family data about departing and incoming CEOs are from the Danish Civil Registration System (CPR). These official records include the personal identification number (CPR), (equivalent to the U.S. social security number), the name, gender, date of birth and death of all Danish individuals. In addition, these records contain the names and CPR numbers of parents, siblings, and children, as well as, the individual's marital history (number of marriages, divorces, and widowhoods). We use these data to construct CEOs' family trees and to identify whether departing and incoming CEOs are related by blood or marriage.

To match the names of top management reported in KOB to their CPR numbers, which are needed to access their individual and family information in the Danish Civil Registration System, we use a database from the Danish Commerce and Companies Agency (Erhvervs- og Selskabsstyrelsen or E&S), at the Ministry of Economic and Business Affairs. The E&S dataset reports both the names and CPR numbers of management and board members of all limited liability corporations.⁵ Under Danish corporate law firms are required to file to E&S any change in the CEO or board positions within two weeks of the actual date of occurrence.⁶

We report a CEO succession when four conditions are met. First, based on data from KOB the departing (entering) CEO had been (stayed) in his/her position for at least two years. Second, CEO names were matched with their relevant CPR number using E&S. Third we required that matching financial information from KOB was available around CEO transitions. Fourth, we retained one succession per firm.

⁵ We compare the name of a manager in KOB with all possible names of managers and board members in E&S for the particular firm in question rather than with the population of managers and board members. This reduces the potential for incorrect matches arising from multiple individuals having the same name.

⁶ We match around 90 percent of all managers involved in successions. In addition, despite the fact that it is common in Denmark for women to change their name when they marry, we match both men and women equally well. The reason is that we use women's family trees to reconstruct their maiden names as well as other names they had in previous marriages.

II.B. Summary Statistics

Firm Characteristics

Table I presents summary statistics of the firms in the sample both as a group (Column I), and when we classify them by the family links between the departing and incoming CEOs: *family* (Column II), when the incoming CEO is related by blood or marriage to the departing CEO and *unrelated* (Column III), otherwise.

Not surprisingly, firms that undergo family successions are relatively smaller than those firms that select unrelated CEOs. The difference in the natural logarithm of total assets is statistically significant at the 1 percent level. On average, family succession firms had Danish Krone 12.7 million (not reported) or USD \$2.1 million in assets.⁷ In contrast, firms that selected an unrelated CEO had Danish Krone 15.1 million or around USD\$ 2.5 million in assets.

We present three measures of firm profitability: the ratio of operating income or earnings before interest and taxes (EBIT) to the book value of assets, the ratio of net income to assets, and the industry adjusted EBIT to assets level, which is calculated using the average of the relevant firms' four-digit NACE (European industry classification system) benchmark. All measures show that firms that promoted a family CEO were more profitable per dollar of assets than those firms that selected an unrelated CEO and that the difference across groups is economically and statistically significant. Based on operating income, firms that promoted a family CEO were 1.4 percentage points (34 percent) more profitable than firms that appointed an unrelated CEO.

In Table I, we also present the age of firms in the sample. We find that firms undergoing CEO successions have, on average, 18 years of existence. We find no statistical difference in firm age across types of CEOs.

⁷ The exchange at the time of writing was equivalent to 6 Krone per U.S. dollar.

Table I highlights the fact that, when we take a comprehensive view of firms in an economy, family successions are likely to occur in relatively smaller and more profitable firms. The marked difference between these firms and those that promote unrelated CEOs indicates that CEO succession decisions might not be random. As a result, it is not obvious that family or unrelated CEOs might be a fair counterfactual for each other observed succession.

Family Characteristics and CEO Succession Decisions

In Table II we explore the correlation between family characteristics and the choice of incoming CEO. We present the number and fraction of CEO successions when classified as *family* (Columns II and III) or *unrelated* (Columns IV and V) successions. Also, we further decompose family successions into *family-children* transitions when the incoming CEO is a family CEO and a child of the departing CEO (Columns VI and VII).

Overall, family successions occur in 2,980 out of 9,511 CEO successions in our sample (31.3 percent). Column VI shows that 1,229 (41 percent) family successions involve the children of the departing CEO. Given the large fraction of privately held firms in our data, the fraction of family transitions might appear low. However, according to La Porta et al. (1998) Denmark is among the highest-ranked countries in terms of “rule of law” (10 out of 10 in their measure), which might reduce the expropriation potential by unrelated CEOs and, as a result, diminish the relative attractiveness of family CEOs (Burkart et al. 2003).

In Table II, Panel A we show the frequency of family successions conditional on the number of children of the departing CEO. We find that the frequency of family successions increases with the number of children. It rises from 29.1 percent for departing executives with one child to 36.5 percent for departing executives with 3 children. The associated difference of 7.4 percentage points is significant at the one-percent level and it represents an increase in the probability of a family transition of 25.4 percent. In addition, we find that the rate of increase in this frequency decreases in the number of children.

It is important to highlight that, although Panel A shows a strong pattern between the number of children and the probability of family successions, it is difficult to interpret these correlations as causal since larger families and family successions might be determined by omitted variables. For example, a preference for a close family could explain the correlation of family size and family CEOs.

Table II also shows that the structure of the family could also affect the choice of CEO inside the family. In particular, family firms seem to have a preference for children relative to spouses, parents or siblings at the time of succession. In Table II Panel A, we observe that family transitions account for 24.8 and 29.1 percent of all successions when the departing CEO has no children or one child, respectively. Yet, the number of children promoted to the top executive position increases from 0 (by construction) to 9.4 percent of all observations. In other words, the frequency with which other family members are promoted to the CEO position decreases from 24.8 percent of all cases when the CEO had no children to 19.7 percent when he or she had one child. That is, children crowd out other members of the family.

In Panel B we document that the marital history of CEOs can potentially affect both the choice of family or unrelated CEOs and whether children arrive to the CEO position. We show that family successions seem to be less common in firms in which the outgoing CEO had no spouse than in firms in which they had exactly one spouse. This could simply reflect the fact that the pool of potential family candidates is larger when the outgoing CEO has a spouse.

More interestingly, the frequency of family transitions decreases for CEOs that, at the time of succession, had been associated with more than one spouse. For this group, it is 9.1 percentage points or 27 percent lower than for firms where the departing CEO has had only one spouse, a difference that is significant at the one-percent level. Column VII shows that more than 75 percent of this difference (7.1 out of 9.1) is attributable to fewer children arriving to the CEO position. These correlations suggest that exploring the impact of family conflicts on firm performance might be an interesting topic in its own right.

In Table II Panel C, we explore the correlation between the ratio of male to total number of children and successions decisions. We report that firms in which more than 50 percent of the outgoing CEO's children are male are 8.7 percentage points more likely to have a family successor than firms in which less than 50 percent of the outgoing CEOs children are male. This difference is significant at the one-percent level. A drawback of this ratio is that it is partly endogenous as individuals can affect its variance through their choice of family size (it converges to 50 percent as the number of children increases). In contrast, the exogenous component of this ratio is the gender of the first child, which is determined by nature.

The Gender of the First-Born Child

To explore whether family characteristics might have a causal impact on the probability of observing a family succession we report in Table II Panel D, the correlation between a family trait that is likely to be random and the decision to promote a family CEO. We argue that the gender of the first-born child of a departing CEO is likely to be randomly assigned. This is likely to be the case for departing CEOs in the sample, as over 80 percent of them had their first child prior to 1980, before current techniques to identify the gender of children were widespread.

Table II, Panel D shows that outgoing executives whose first-born child is male are 7.1 percentage points more likely to leave the firm to a family member than their counterparts whose first-born child is female. The difference between these two groups is significant at the one-percent level. Moreover, Column VII shows that the difference in the frequency with which the outgoing CEO's children get the top position increases by 8.7 percentage points, also significant at the one-percent level. Once more, these numbers indicate that children crowd out other relatives: the frequency of non-children family CEOs declines from 18.2 percent when the outgoing CEO's first-born child is female to 16.7 percent when he is male.

These correlations confirm anecdotal evidence that male children are preferred to females at the time of succession or that primogeniture inheritance rules are still followed even in a developed country like Denmark. The magnitude of the difference (24.8 percent) might appear large given that Denmark is a country with a high overall level of gender equality (it ranks fourth among 58 countries according to data from the World Economic Forum) and one of the highest female labor force participation rates in the world.⁸ Nevertheless, these numbers are consistent with the low levels of female participation among top management positions in Denmark. In 2004, the fraction of women among top managers was only 25 percent compared with 61 percent in intermediate level positions.⁹

Having established that firm characteristics affect both (1) the decision to name a family CEO, and (2) who within a family gets the CEO position, we turn to describing our empirical strategy to investigate the consequences of family successions on firm performance.

III. Empirical strategy

III.A. Difference in differences

A simple way to evaluate the impact of family CEOs on performance is to estimate the change (difference) in firm profitability around CEO successions, and assess the way in which firms' outcomes have changed as a result. This statistic is attractive because it provides an estimate of the impact of CEOs on performance that is not affected by firms' time-invariant characteristics. However, a drawback of this approach is that it can potentially fail to control for aggregate changes in performance that are due to, for example, macroeconomic trends, or succession-specific patterns in performance. Two common fixes to this problem are (a) adjusting the measures of profitability using industry benchmarks, and (b) using a difference-in-differences

⁸ See http://www.weforum.org/pdf/Global_Competitiveness_Reports/Reports/gender_gap.pdf for statistics on gender inequality and 2001 Statistical Yearbook published by Danish Statistics for cross country comparison on women's labor force participation.

⁹ See <http://www.dst.dk/HomeUK/Statistics/ofs/Publications/Yearbook> (Table 136).

analysis by comparing the changes in performance of firms that name a family member to the CEO position to those of other firms that experience a succession by unrelated CEOs.

We start by performing a difference-in-differences (DD) analysis on the relative performance of family and unrelated CEOs as described below:

$$y_i = a_1 + X_i' b_1 + c_1 \text{famCEO}_i + \varepsilon_{1i}, \quad (1)$$

where the subscript 1 denotes the equation number. y_i is the difference in performance estimated using the three-year average before and after CEO transitions. famCEO_i is an indicator variable equal to one if the incoming CEO is *family* and zero if unrelated. Under the null that all CEOs are equally talented c_1 would not be different from zero.

III.B. Instrumental Variables

A shortcoming of implementing a DD analysis is that it requires that the *program* to be evaluated not be implemented based on differences in outcomes (Bertrand et al. 2004). In our setting, this requirement implies that the decision of naming a family or an unrelated CEO be uncorrelated to firms' determinants of performance. This assumption appears to be a strong one. To overcome this problem we use instrumental variables (IVs).

An example

To illustrate the potential drawbacks of a DD approach and the advantages of using IVs in this setting, we use the following example:

Suppose that post succession performance is given by $Q + I$, where Q is the quality of the firm's new projects, and I is related to the identity of the successor. CEO successions can be of two types: family or unrelated. Let $I=f$ when the incoming CEO is related to the outgoing CEO and $I=u$ when the incoming CEO is unrelated. We are, therefore, interested in estimating $f-u$.

Suppose further that there is heterogeneity in the quality of firms' new projects around succession decisions that the econometrician cannot observe or perfectly control for. Specifically, the quality of a firm's new projects can be high (q_H), medium (q_M), or low (q_L) each with probability one third.

The DD estimator would yield $f-u$ directly if family and unrelated CEOs were randomly assigned to firms. To make the example interesting, however, and in the spirit of Hermalin and Weisbach (1998), suppose that the better the quality of the firm's investment opportunities, the more likely the departing CEO is to choose a family successor. Also, suppose that, as suggested by Table II, the likelihood of a family succession is higher when the CEO's first-born child is male. The following table illustrates an example of a decision rule that satisfies these conditions:

Investment Opportunities	Gender of First Child	
	Male	Female
High	Family CEO ($q_H + f$)	Family CEO ($q_H + f$)
Medium	Family CEO ($q_M + f$)	Unrelated CEO ($q_M + u$)
Low	Unrelated CEO ($q_L + u$)	Unrelated CEO ($q_L + u$)

Under such decision rule, family (unrelated) successions would never occur under low (high) quality of new projects and thus the DD estimate would reflect not only the true effect of family CEOs but also a selection bias, which would then be incorrectly attributed to CEO talent. In consequence, the DD estimate in this example would have an upward bias.¹⁰ Graphically, the DD estimator compares the changes in performance of family successions, which would tend to occur in the upper part of the table above, to unrelated successions, which would tend to happen in the lower part of that table.

¹⁰ It is easy to see that a selection bias in the DD estimator would exist as long as the decision to appoint a family CEO is not orthogonal to other determinants of firm performance. Using the example above, the sign of the bias would change depending on the correlation of family CEOs and investment prospects.

The IV approach, in contrast, starts by using information on all CEO successions conditional on the gender of the first-born child and then compares the outcome of CEO successions as a function of the instrument. Intuitively, this is equivalent to comparing the outcomes of all CEO transitions in the table above and calculating the difference in performance across columns.

In the previous example, if (a) the quality of new projects is high, all firms promote a family CEO regardless on the gender of the first child, (b) if the quality of new projects is low, all firms promote an unrelated CEO, regardless of the gender of the first child, and (c) if the quality of new projects is medium, those firms with a male first child would promote a family CEO while those with a female first child would promote an unrelated CEO. (a) and (b) imply that, if the quality of the firm's new projects is either high or low, both the male and female groupings are identical and therefore these observations cancel each other out when the difference between groupings is performed.

As a result, in this example, the IV estimator uses only the information of the group with medium investment prospects. This is a general result: estimates from instrumental variables use only the information of the group of firms that respond to them (Imbens and Angrist, 1994). We can also see in the table that the IV estimator is not contaminated by differences in investment opportunities, which are constant for all firms in the moderate category.

The example above highlights the advantages of using instrumental variables, namely, that this method is explicit about the source of variation used to estimate the relative impact of family and unrelated CEOs, and that this variation is arguably orthogonal to firms' prospects. Yet, it also points to a potential concern in interpreting the estimated results: they are only based on a sub-sample of firms which are affected by the instrument. Specifically, they are based on the firms that get a family (unrelated) CEO only because the first-born child was male (female).

Instrumental Variables Estimation Framework

We use the gender of the first-born child of a departing CEO of a corporation to instrument for whether a firm will be managed in the next succession by a family CEO.

$$famCEO_i = a_{2i} + X_i' b_2 + c_2 genderfirst + \varepsilon_{2i} \quad (2)$$

As before, $famCEO_i$ is an indicator variable equal to one if the incoming CEO is related by blood or marriage to the departing CEO and zero otherwise. Here $genderfirst$ is an indicator variable that is equal to one if the first child is male and 0 if female. Note that even though $famCEO_i$ is a dichotomous variable, we estimate (2) using ordinary least squares (OLS) since a probit or a logit first stage can harm the consistency of the estimates (Angrist and Krueger, 2001). The second stage equation estimates the impact of family successions on changes in firm performance:

$$y_i = a_3 + X_3' b_3 + c_3 fam\hat{CEO}_i + \varepsilon_{3i} \quad (3)$$

We estimate (3) using two-stage least squares (TSLS). We are interested in c_3 , which captures the direct effect of a family succession on changes in performance.

Sorting by the Gender of the First-Born Child: Firm and Family Characteristics

As we previously argued, we think that the gender of the first child born to the departing CEO of a corporation is likely to be a valid instrument for family transitions as, historically, a first-born male is more likely to receive inheritances (primogeniture rule), one of which might be the helm of the family firm. Panel D in Table II shows that this historical pattern holds true for the case of Denmark. We also posit that it is hard to make the case that firms' prospects are directly related to the gender of the first child of the CEO.

In Table III we present firm and family characteristics by the gender of the first-born child of a departing CEO as an initial test for whether this variable is directly correlated with firm or family characteristics beyond its effect on succession decisions.

At the time of transition, we find no difference in terms of firm size, operating profitability and net income between those firms whose departing CEO had a male first child and those whose first child was female. Table III stands in stark contrast to Table I in which we found significant differences in firm characteristics for family and unrelated transitions.

One concern of the above-described instrumental variable is that families with a strong preference for male children and whose first-born child is female would tend to be larger in size than their male first-child counterparts. As a result, the gender of a first child would be correlated with family size, which in turn might affect firm performance. To assess the relevance of this potential channel, Table III presents the average number of children born to departing CEOs. It shows that, conditional on having at least one child, the average number of children is 2.2 irrespective of the gender of the first child. In short, we find no evidence that the gender of the first child affects family size.

Alternatively, and given the evidence from Dahl and Moretti (2004) who document differential marriage rate as a function of the gender of children (larger for males), male first-children might affect the departing CEOs' marriage decisions and potentially firms' prospects. If this effect were present in this sample, the IV strategy would be incorrectly attributing this effect to CEO talent. However, the last line of Table III shows that the number of spouses is not statistically different for departing CEOs with female or male first children.

In sum, based on Table III we find no evidence that firm characteristics or family size differ as a function of our instrument. This "no difference" table bolsters our confidence that the gender of the first child of a departing CEO is likely to be uncorrelated to firms' prospects.

IV. Results

IV.A. Difference-in-Differences

To analyze the relative performance of family CEOs, we first examine changes in firm performance of both family and unrelated CEO around CEO transitions using a difference-in-differences approach.

Following the CEO turnover literature (Denis and Denis, 1995; Huson et al. 2004) and prior work on family CEO transitions (Pérez-González, 2003), Table IV, Panel A presents measures of operating profitability relative to assets. To control for common industry time-trends the measures are adjusted using the average of the relevant four-digit NACE industry. The measures are three-year average profitability for all firms before and after CEO transitions.

Column I in Table IV indicates that firms that experience CEO transitions, on average, exhibit lower profitability relative to their industry peers before succession. This average is significant at the one-percent level. After transitions, the firms in the sample do not significantly improve their performance.

When we compare the profitability levels prior to the transitions for family and unrelated successions (Columns II and III, respectively), we find that family successions tend to occur in firms with above-average profitability while unrelated successions tend to happen in firms with below average performance. Prior to CEO transitions, the difference in profitability between these groupings is economically and statistically significant at conventional levels and it is equivalent to 1.4 percentage points relative to assets, as shown in Column IV

Given that, as suggested by Table I, firms that promote family CEOs are likely to differ relative to those that select unrelated CEOs, we proceed to compare the within group change in performance around transitions. Within firm variation allows us to control for both observable and unobservable time-invariant characteristics that might affect firms' profitability.

We find that firms that promote family CEOs experience a decline in profitability of 1.1 percentage points. This difference is statistically significant at the one-percent level. In contrast, firms that promote external CEOs undergo improvements in profitability of 0.2 percentage points, an increase that is not statistically different from zero at conventional levels (t-statistic of 1.4).

As a result, the average difference-in-differences (DD) suggests that family successions are associated with 1.35 percentage points lower performance relative to unrelated successions. This decline is equivalent to 25 percent of the average unadjusted operating income to assets. The estimated gap in profitability is similar in magnitude to the one found by Pérez-González (2003) in publicly traded firms that promote family over unrelated CEOs in the United States.

In Table IV, panel B, we further investigate the gap in performance associated to family CEOs using alternative measures of profitability. In each row we present the difference in average profitability for family and unrelated transitions, respectively, as well as the mean difference-in-differences estimator. In addition we report the median difference-in-difference.

We show changes in three measures of performance: (1) operating income to assets, (2) industry-adjusted operating income to assets (used in Panel A) and (3) industry-adjusted net income over assets. The results confirm the patterns presented in Panel A. Namely, firms that promote family CEOs undergo significant declines in profitability while the profitability of firms that promote unrelated CEOs is marginally higher or unchanged, but not statistically different from zero at conventional levels. In every case, however, the mean difference-in-differences estimator is negative and statistically different from zero. The results obtained using median regressions yield similar findings and indicate that these differences in performance are not driven by outliers.

To further investigate the improvements in profitability associated with unrelated CEOs we also present a difference-in-differences estimator on the natural logarithm of total assets. The results indicate that unrelated successors increase the asset base by more than family successors. Together with the results on profitability, these patterns indicate that unrelated CEOs increase

operating income more than proportionally to their increase in assets, and that the gains in operating performance are not explaining by differential reductions in the asset base.

While the above-described patterns in performance shows that family transitions are correlated with lower profitability relative to unrelated transitions, it is difficult to establish causality. The decision to appoint a family CEO is unlikely to be taken randomly irrespective of firms business prospects. In consequence, the result might be explained by unobserved differences in investment opportunities even when there is no differential performance between family and unrelated CEOs. For example, it is possible that outside CEOs are promoted when a recovery in performance is in sight. Another possibility is that performance is mean reverting and that departing CEOs can only name a family heir after an abnormally profitable year.

Alternatively, the DD estimator might underestimate the true decline in performance associated with family successions if related CEOs are promoted to the helm in firms with relatively superior prospects. If that were the case, the true effect of family succession would be even more damaging to firm performance. To address these concerns we now turn to explore the impact of family successions on firm performance using instrumental variables.

IV. B. Instrumental Variables

First stage

Table V presents the first stage relationship between the gender of the departing CEO's first-born child and the type of succession. Consistent with Table II, having a male first child is strongly positively correlated family CEOs. We find that firms whose departing CEO had a male first child are 7.1 percentage points more likely to observe a family succession relative to those that had a female first child, a difference that is statistically significant at the one-percent level. In economic terms, it implies an increase in the probability of observing a family succession of 25 percent. Moreover, the *F*-statistic equal to 48 suggests that the gender of the first child is unlikely

to be a weak-instrument and as a result, the IV estimates are unlikely to be biased towards those of OLS (Bound et al. 1995; Staiger and Stock, 1997; Stock and Watson, 2003).

Even though the number of male children is likely to be an endogenous variable, in Column II we examine its effect on family transitions. The coefficient is significant at the one-percent level and it also economically significant: An additional son increases the probability of a family transition by 5.4 percentage points.

In Table V we also present alternative specifications including firm characteristics such as firm size and year dummies (Column III), and additionally, firm age and firm profitability (Column IV). As it was suggested in Table I, first stage results show that family successions tend to occur in smaller and more profitable firms relative to those that promote unrelated CEOs. Results also indicate that older firms are more likely to undergo a family transition.

In Column V of Table V, we present first-stage results when using both the gender of the first-born child and the number of male children as instrumental variables for family successions. Not surprisingly, the economic relevance of the gender of the first child indicator variable is significantly reduced as this variable is strongly positively correlated with the number of male children. Yet it continues to be significant at the five-percent level.

Reduced form

Having established the strong impact of the gender of the first child on the probability of family succession, we turn to analyzing their effect on performance. We start by exploring the relevance of this instrument by evaluating its reduced form correlation with firms' changes in firm profitability around CEO successions, our key dependent variable of interest.

The results are presented in Table VI. We find a strong and negative correlation between changes in firm performance and having a CEO whose first child is male. The estimated coefficients show that the group of firms in which the first-born child is male experienced an

average performance drop around CEO transitions between 0.7 and 0.9 percentage points, relative to the group of firms in which the departing CEO's first-born child is female.

In reading the results from Table VI it is important to highlight that while the gender of an individual's first child is likely to be randomly assigned, it is still possible that the timing of family versus unrelated CEO successions might differ in a way that could affect performance evaluations. However, the evidence presented in Table III suggests that firm characteristics conditional on the gender of the departing CEO's first-born child are comparable: firm size, age, and profitability prior to CEO transitions are not statistically different from zero.

Given that the only difference across groups is that "first child male" firms were more likely to experience a family transition, the result that they are undergoing large declines in performance should be interpreted as strong evidence that family successions hurt firm performance. This finding is now free from endogeneity and omitted variable concerns. Yet the magnitude of this difference has to be adjusted to reflect the fact that it is explained by a subset of the sample, i.e. the firms that were likely to be affected by the instrument. We now estimate this magnitude, using two-stage least squares (TSLS).

Second Stage

In Table VII we examine the impact of family successions on changes in performance around CEO successions using alternative specifications. In Column I and to ease its comparison to the IV estimate, we provide OLS estimates of the effect of family successions on performance comparable to those found in Table IV but after controlling for firm size and firm profitability before CEO transitions. The DD estimates suggest that firms that promote family CEOs trail other firms around successions by approximately 0.8 percentage points in terms of firm profitability. The regression in Column I uses the entire sample of successions while, for

comparability purposes, that in Column II uses the same sample as the IV regressions, which requires the outgoing CEO to have at least one child to be able to construct the instrument.

Columns III through VII of Table VII present the estimated coefficients using IVs. As anticipated by Table VI, the impact of family CEOs on performance is negative and it is always statistically significant at conventional levels. In all cases, the magnitude of the estimated coefficient is larger than the one found using OLS, implying a reduction in profitability relative to unrelated transitions of at least six percentage points. These results are robust to using as instrument only the gender of the first-born child (Columns III and IV), and additionally the number of male children (Column V) and the total number of children (Column VI).¹¹

Given that the estimated gap in performance is extremely large and that changes in performance might potentially capture influential observations, we also explore the robustness of the results to estimating a median regression in the second stage. The estimated coefficient in Column VII suggests a negative impact on firm profitability of 6 percentage points, which indicates that outliers are not likely to account for our findings.

The large gap between IV and OLS estimates suggests that family successions tend to occur when unobserved firm performance is expected to improve or alternatively, that unrelated CEOs tend to face more challenging environments. As a result, OLS underestimates the true differential in performance between family and unrelated CEOs. An alternative interpretation of this finding is that professional CEOs provide important services to corporations.

Robustness

Even though Table III provided evidence that the first child male-female groupings were comparable prior to succession in terms of size and profitability, a potential concern with the

¹¹ Results are also robust to using both the gender of first children and the number of spouses as instruments as well as, to estimating our main specification in the sample of departing CEOs with only one spouse (results not shown).

results thus far presented is that we might be capturing differences in performance that could be attributed to a differential timing of CEO successions for family or unrelated managers.

In Table VIII we present evidence that this is not likely to be the case. In Columns I, II and III, we examine whether firms that promote family CEOs experience abnormally low performance relative to those that promote unrelated CEOs during three different windows of analysis. In Column I we examine changes in performance using a window before the transition, estimated around year $t=-3$. In Column II we use estimate changes in performance in a window around the transition (as before), and in Column III we estimate changes in performance using a post-transition window of analysis, centered on year $t=3$. In all cases, changes in performance are computed as the difference in the three-year average firm profitability around the relevant year.

We fail to find a statistically significant difference between firms that undergo family successions and those firms that promote unrelated CEOs in any window of analysis, except for the window that contains CEO transitions (Column II). The result of Column I indicates that performance prior to succession is not affected by the gender of the departing CEO's first-born child. This result casts doubt on the idea that in the group of firms affected by the instrument, CEO's time their succession differentially. In addition, the result in Column III indicates that firms that undergo family transitions do not recover. The lack of post-succession recovery is additional evidence on the permanent negative impact of family CEOs.

In Columns IV, V and VI of Table VIII we examine the robustness of our findings on alternative sub-samples based on the departing CEO's age. In Column IV we only include CEO transitions in which the departing CEO left the helm between 55 and 65 years of age. We find an estimate decline in performance of 10 percentage points, demonstrating that the patterns identified in Table VII are not explained by late retirements by founders. In Column V (VI) of Table VIII we restrict the sample to succession in which the departing CEO is younger (older) than the median of the firms in the sample. In both sub-samples the estimated coefficient on family CEO is negative. However, this coefficient is not significant in the sample of young

departing CEOs. This is to be expected as the children of younger CEOs are unlikely to be promoted to the CEO position and as a result the gender of the first child –the first stage– explains very little of the variation in CEO appointments.

Finally, we also present results when we restrict the sample to observations in which the outgoing CEO dies around management transitions. In this group, the endogeneity of the timing of the succession is less of a concern as presumably some of these events were unexpected yet using our IVs is a hard test as the sample size falls dramatically. We find that even in this case, the estimated coefficient is negative and similar in magnitude to previous specifications, although its associated standard errors are much larger.

Interactions with Industry Characteristics

We proceed to investigate if the relative performance of family CEOs varies with observed industry characteristics. We focus on industry-level interactions with our instrument to mitigate endogeneity concerns of using firm-level characteristics.

A natural place to start this analysis is by investigating if the gap in performance for family CEOs differs in industries where family CEOs are relatively more common and presumably better suited for their positions. To measure the relative frequency of family successions by industry, we create an indicator variable that takes the value of one for industries with above median concentration of family firms, and zero otherwise, which is then interacted with the gender of the first child born to a departing CEO.

Table IX, Column I shows that while family CEO hurt performance in all settings, they are indeed less detrimental to firm performance (around 50 percent less harmful) in those industries where they are more commonly found relative to settings where they appear infrequently. This difference is significant at the five-percent level. Using an analogous specification using industry-level averages of family presence at the board, yields similar yet insignificant results.

We hypothesize that managerial skills are potentially more valuable in certain economic environments, such as innovative industries and less important in mature business where managers might be relatively less important than, for example, firms' established production processes or organizational cultures.

As before, we first create an industry wide measure of alternatively, (1) industry maturity, (2) firm entry, (3) research and development (R&D) activity and (4) industry concentration, and then we interact these measures with our instrumental variable. We classify an industry as "mature" if the growth rate in the value of production between 1990 and 2002 was lower than the median growth rate of all industries in Denmark. Similarly, industries are classified as "dynamic entry", "R&D intensive" or "concentrated" if its average firm age, R&D spending between 1990 and 2002, or Herfindahl-Hirschman Index in 1992, respectively, were above the median of the universe of firms in Denmark, and zero otherwise.¹²

Table IX, Columns III to IV presents the results. In each column we present IV-TSLS results for family CEO and the interaction between family CEO and the above described industry characteristics. We find that family CEOs tend to be costlier in fast growing industries, in sectors with significant firm entry and in environments with substantial innovation as captured by our measure of R&D intensity. These patterns suggest that family CEOs are particularly damaging to firm performance in situations that are complex to manage.

Finally, Column VI in Table IX shows the differential effect of family successions as a function of industry concentration. The result shows higher gaps in performance in relatively concentrated industries, where perhaps the scope for poor performance is higher as survival is potentially guaranteed by the lack of competition.

¹² Industry level data on the value of production and spending in R&D by industry is from the OECD, where available. Industry concentration numbers are calculated using the shares in the book value of assets in an industry. Assets values and firm age are obtained from the main primary source as the key variables of interest.

Interpretation

In this paper we are explicit about the source of variation we use to examine the impact of family successions on firm performance. Given that the variation in the gender of the departing CEO's first-born is likely to be uncorrelated to firms' investment opportunities, the results demonstrate that family successions cause significant declines in firm performance.

The findings show that qualified CEOs provide extremely valuable services to the organizations they work for. They also demonstrate that primogeniture rules that dictate who gains access to the helm of a firm based on birth order or gender, but not competence, can have disastrous consequences for firm performance.

The negative effect of family CEOs on performance suggests that minority shareholders at family-controlled firms are likely to suffer the most under family CEOs as non-controlling investors do not participate in the private benefits of control. It also indicates that other stakeholders interacting with family firms should pay close attention to succession decisions as the competence gap between family and unrelated CEOs might be substantial.

A common caveat in interpreting the estimated results using instrumental variables is that not every firm in the sample is affected by the IV, and as such, the results of this paper are only representative for those firms whose succession decisions are affected by it. In particular, one might posit that the sub-sample of family CEOs that are promoted due to the instrument are of a lower average quality relative to the pool of family CEOs that get control irrespective of it. If that were the case, the *average* causal effect of family CEOs on performance might not be as disastrous as the results from our instrument indicate.

V. *Conclusions*

In this paper we used a unique dataset from Denmark to investigate the inside workings of family firms. Our objective was to shed light on two questions: first, do family characteristics affect firm decisions? And second, what are the consequences of these decisions on firm performance? These questions were examined in the context of CEO succession decisions.

We showed that family characteristics such as family size, the gender composition of children or the marital history of a family head can affect both the decision to appoint a family or an unrelated CEO and the identity of a family successor.

We then used the fact that the gender of the first child born to a departing CEO is exogenous as an instrument for testing the impact of family successions on performance. We found that family CEOs had a dramatic causal impact on firm profitability: family CEOs reduced firm profitability on assets by at least 6 percentage points, which is significantly larger than prior estimates in the literature. Our findings show that addressing endogeneity concerns related to firms' decisions are extremely important for understanding the role of family firms.

The result that family CEOs hurt firm performance might suggest that countries where the control and management of assets is commonly transferred among kin, can potentially underperform other economies where assets and management are competitively matched.

The implications of our findings are potentially important for other settings in which families play an active role in firm decision-making. La Porta et al. (1999) have documented that families are the most common large shareholder of publicly traded corporations; and private firms are commonly associated to one family. Our results indicate that controlling families that enjoy in the private benefits of control can endorse decisions that might be inferior for other stakeholders.

Finally, our findings could also be interpreted as supportive evidence against primogeniture rules in inheritances.

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TABLE I. FIRM CHARACTERISTICS BY TYPE OF CEO SUCCESSION

Chief executive officer (CEO) successions are classified into two groups: *family*, when the entering CEO is related by blood or marriage to the departing CEO, *unrelated*, otherwise. *Ln assets* is the natural logarithm of the total book value of assets in Danish Krone. *EBIT / Assets* is the ratio of operating (ordinary) income to total assets. *Net income / Assets* is the ratio of net income (final result) to total assets. *Industry adjusted EBIT / Assets* is the difference between *EBIT / Assets* and the average of its four-digit NACE (European industry classification system) benchmark. *Firm age* is the difference between the year of CEO transition and the oldest of: the year of establishment, the year of registration or the year of firms' by-laws. *Number of children of departing CEO* is the number of children registered in the Danish Civil Registration System (CPR). Firm information is from the *Købmandsstandens Oplysningsbureau's (KOB)* dataset, which is based on firms' annual reports to the Danish Ministry of Economics and Business Affairs. Standard errors are in parentheses and the number of observations in square brackets.

Variable	Type of Succession			
	All	Family	Unrelated	Difference
	(I)	(II)	(III)	(IV)
Ln assets	8.421 (0.020) [9,511]	8.096 (0.0276) [2,980]	8.569 (0.026) [6,531]	-0.473 *** (0.0379)
EBIT / Assets	0.045 (0.0015) [9,511]	0.055 (0.0026) [2,980]	0.041 (0.0019) [6,531]	0.014 *** (0.0032)
Net income / Assets	0.031 (0.0013) [9,511]	0.037 (0.0022) [2,980]	0.028 (0.0016) [6,531]	0.010 *** (0.0028)
Industry adjusted EBIT / Assets	-0.007 (0.0015) [9,511]	0.002 (0.0026) [2,980]	-0.011 (0.0019) [6,531]	0.013 *** (0.003)
Firm Age	18.091 (0.2106) [9,511]	18.569 (0.3357) [2,980]	17.873 (0.2657) [6,531]	0.696 (0.4281)

***, ** and * denote significance at the 1, 5 and 10 percent level, respectively.

TABLE II. FIRM SUCCESSIONS AND FAMILY CHARACTERISTICS OF DEPARTING CEOs

Chief executive officer (CEO) successions are classified into two groups: *family*, when the entering CEO is related by blood or marriage to the departing CEO, *unrelated*, otherwise. Family successions are further classified as *family-children* successions, when the entering CEO is the child of the departing executive. In Panels (A) to (D) the frequency of family and unrelated successions are presented by alternative family characteristics of the departing CEOs: (A) the number of children, (B) the number of spouses, (C) by the gender of the first-born child, and (D) the ratio of males to the total number of children. CEO successions data are from *Købmandsstandens Oplysningsbureau's* (KOB) dataset, which is based on firms' annual reports to the Danish Ministry of Economics and Business Affairs. Family characteristics data are from the Danish Civil Registration System (CPR). Standard errors are presented in parentheses.

Description	Number of Successions (I)	Type of Succession					
		Family		Unrelated		Family: Children	
		Number (II)	Percent (III)	Number (IV)	Percent (V)	Number (VI)	Percent (VII)
All	9,511	2,980	0.313	6,531	0.687	1,229	0.129
<i>A. Number of children:</i>							
0	1,253	311	0.248	942	0.752	-	0.000
1	1,419	413	0.291	1,006	0.709	133	0.094
2	4,265	1,307	0.306	2,958	0.694	578	0.136
3	1,994	727	0.365	1,267	0.635	400	0.201
4 or more	580	222	0.383	358	0.617	118	0.203
Difference (1) minus (0)			0.043 ** (0.017)				0.094 *** (0.008)
Difference (3) minus (1)			0.074 *** (0.016)				0.107 *** (0.013)
<i>B. Number of spouses:</i>							
0	820	160	0.195	660	0.805	8	0.010
1	7,534	2,536	0.337	4,998	0.663	1,130	0.150
2 or more	1,157	284	0.246	873	0.755	91	0.079
Difference (2 or more) minus (1)			-0.091 *** (0.015)				-0.071 *** (0.011)
<i>C. By gender ratio (male/children):</i>							
< 50 percent	2,743	747	0.272	1,996	0.728	248	0.090
= 50 percent	2,363	791	0.335	1,572	0.665	359	0.152
> 50 percent	3,152	1,131	0.359	2,021	0.641	622	0.197
Difference (>50%) minus (< 50%)			0.087 *** (0.012)				0.107 *** (0.009)
<i>D. By gender of first born child:</i>							
Female	3,947	1,129	0.286	2,818	0.714	409	0.104
Male	4,311	1,540	0.357	2,771	0.643	820	0.190
Difference male minus female			0.071 *** (0.010)				0.087 *** (0.008)

***, ** and * denote significance at the 1, 5 and 10 percent level, respectively.

TABLE III. FIRM AND FAMILY CHARACTERISTICS BY THE GENDER OF THE FIRST CHILD OF DEPARTING CEOs

Chief executive officer (CEO) successions are classified by the gender of the first child born to the departing CEO: *male*, when the first-born child was a male and *female*, if the first-born child was female. Firms where the departing CEO had no children are omitted. Ln assets is the natural logarithm of the total book value of assets in Danish Krone. EBIT / Assets is the ratio of operating (ordinary) income to total assets. Net income / Assets is the ratio of net income (final result) to total assets. Industry adjusted EBIT / Assets is the difference between EBIT / Assets and the average of its four-digit NACE (European industry classification system) benchmark. Firm age is the difference between the year of CEO transition and the oldest of: the year of establishment, the year of registration or the year of firms' by-laws. Number of children of departing CEO is the number of children registered in the Danish Civil Registration System (CPR) and the number of spouses is calculated using the number of historical marriages registered at the CPR. Firm information is from the *Købmandsstandens Oplysningsbureau's* (KOB) dataset, which is based on firms' annual reports to the Danish Ministry of Economics and Business Affairs. Standard errors are in parentheses and the number of observations in square brackets.

Variable	Gender of First Child			
	All	Male	Female	Difference
	(I)	(II)	(III)	(IV)
Ln assets	8.456 (0.0215) [8,258]	8.451 (0.0295) [4,311]	8.461 (0.0314) [3,947]	-0.011 (0.0431)
EBIT / Assets	0.046 (0.0016) [8,258]	0.045 (0.0023) [4,311]	0.048 (0.0024) [3,947]	-0.003 (0.0033)
Net income / Assets	0.032 (0.0014) [8,258]	0.030 (0.0019) [4,311]	0.033 (0.0020) [3,947]	-0.003 (0.0028)
Industry adjusted EBIT / Assets	-0.006 (0.0016) [8,258]	-0.008 (0.0022) [4,311]	-0.005 (0.0023) [3,947]	-0.003 (0.0032)
Firm Age	18.151 (0.2285) [8,258]	18.108 (0.3064) [4,311]	18.198 (0.3414) [3,947]	-0.090 (0.4587)
Number of children of departing CEO	2.230 (0.0095) [8,258]	2.240 (0.0131) [4,311]	2.219 (0.0139) [3,947]	0.021 (0.0191)
Number of spouses	1.108 (0.0049) [8,258]	1.102 (0.0066) [4,311]	1.114 (0.0073) [3,947]	-0.012 (0.0098)

***, ** and * denote significance at the 1, 5 and 10 percent level, respectively.

TABLE IV. SUCCESSION DECISIONS AND FIRM PERFORMANCE AROUND CEO TRANSITIONS

Chief executive officer (CEO) successions are classified into two groups: *family*, when the entering CEO is related by blood or marriage to the departing CEO, *unrelated*, otherwise. Panel A reports average industry adjusted EBIT to Assets ratio before (three-year average) and after (three-year average) successions, and differences in these measures around CEO transitions. Panel B presents differences (differences in differences (DD)) around CEO transitions (and across succession groups) for the three-year averages of the following variables (I) EBIT to assets, (II) Industry adjusted EBIT to assets, (III) Industry adjusted net income to assets, and (IV) natural logarithm of assets. The industry adjustment is based on four-digit NACE (European industry classification system) benchmarks. In all cases the year of succession is omitted. Data are from *Købmandsstandens Oplysningsbureau's* (KOB) dataset, which is based on firms' annual reports to the Danish Ministry of Economics and Business Affairs. Standard errors are in parentheses and the number of observations in square brackets.

Panel A. Dependent Variable: Industry-Adjusted Profitability on Assets (EBIT/Assets)				
	Type of Succession			
	All	Family	Unrelated	Difference
	(I)	(II)	(III)	(IV)
Before	-0.0036 (0.0012) [9,511]	0.0062 (0.0019) [2,980]	-0.0080 (0.0014) [6,531]	0.0141 *** (0.0024)
After	-0.0054 (0.0013) [9,511]	-0.0050 (0.0021) [2,980]	-0.0056 (0.0016) [6,531]	0.0007 (0.0026)
Difference	-0.0019 (0.0014)	-0.0111 *** (0.0023)	0.0024 (0.0017)	-0.0135 *** (0.0029)

Panel B. Alternative Dependent Variables (Difference-in-differences (DD) analysis)				
Differences in	Type of Transition			
	Family	Unrelated	Mean Difference-in-Differences	Median DD
	(I)	(II)	(III)	(IV)
EBIT/Assets	-0.0131 *** (0.0023)	0.0031 (0.0017)	-0.0162 *** (0.0029)	-0.0084 *** (0.0019)
Ind-Adjusted EBIT/Assets	-0.0111 *** (0.0023)	0.0024 (0.0017)	-0.0135 *** (0.0029)	-0.0090 *** (0.0021)
Ind-Adjusted Net inc/Assets	-0.0104 *** (0.0020)	0.0005 (0.0015)	-0.0109 *** (0.0025)	-0.0035 ** (0.0016)
Ln Assets	0.0232 *** (0.0021)	0.0446 *** (0.0018)	-0.0214 *** (0.0027)	-0.0049 *** (0.0015)

***, ** and * denote significance at the 1, 5 and 10 percent level, respectively.

TABLE V. GENDER OF THE FIRST-BORN CHILD AND FAMILY SUCCESSIONS (FIRST STAGE)

The dependent variable is an indicator variable equal to one if the incoming CEO is related by blood or marriage to the departing executive, zero otherwise. Gender of the first-born child is an indicator variable equal to one if the first-born child of the departing CEO is male, 0 if she is female. Number of male children is the number the departing CEOs' male children registered in the Danish Civil Registration System (CPR). *Ln assets* is the natural log of the book value of assets at the time of succession. Firm age is the difference between the year of succession and the oldest of: the year of establishment, the year of registration or the year of by-laws. Industry adjusted EBIT to Assets ratio based on four-digit NACE (European industry classification system) benchmarks the year prior the CEO transition. CEO successions and firm data are from *Købmandsstandens Oplysningsbureau's* (KOB) dataset, which is based on firms' annual reports to the Danish Ministry of Economics and Business Affairs. Family characteristics data are from the Danish Civil Registration System (CPR). Robust standard errors are in parentheses.

Explanatory Variable	Dependent Variable: Family CEO				
	(I)	(II)	(III)	(IV)	(V)
Gender of the first born child is male	0.0712 *** (0.0102)		0.0719 *** (0.0101)	0.0709 *** (0.0101)	0.0253 ** (0.0125)
Number of male children		0.0542 *** (0.0057)			0.0453 *** (0.0070)
<i>Ln assets</i>			-0.0301 *** (0.0023)	-0.0344 *** (0.0024)	-0.0344 *** (0.0024)
<i>Firm age</i>				0.0011 *** (0.0002)	0.0011 *** (0.0002)
<i>Industry adjusted EBIT/Assets, t-1</i>				0.2373 *** (0.0352)	0.2349 *** (0.0349)
Year controls	No	No	Yes	Yes	Yes
<i>F-statistic</i>	48.25	88.79	29.81	31.62	32.93
<i>R</i> ²	0.006	0.011	0.029	0.036	0.041
Number of observations	8,258	8,258	8,258	8,258	8,258

***, ** and * denote significance at the 1, 5 and 10 percent level, respectively.

TABLE VI. GENDER OF THE FIRST-BORN CHILD AND CHANGES IN PERFORMANCE (REDUCED FORM)

The dependent variable is the change in firm profitability around CEO successions. Firm profitability is defined as industry adjusted EBIT / assets, defined as the difference between EBIT / assets and the average of its four-digit NACE (European industry classification system) benchmark. Changes in profitability are computed as the difference between the average three-year post-succession profitability minus the three-year average before transition. The year of succession is omitted. Gender of the first-born child is an indicator variable equal to one if the first-born child of the departing CEO is male, 0 if she is female. *Ln assets* is the natural log of the book value of assets at the time of succession. Firm age is the difference between the year of succession and the oldest of: the year of establishment, the year of registration or the year of by-laws. Industry adjusted EBIT to Assets ratio based on four-digit NACE (European industry classification system) benchmarks the year prior the CEO transition. CEO successions and firm data are from *Købmandsstandens Oplysningsbureau's* (KOB) dataset, which is based on firms' annual reports to the Danish Ministry of Economics and Business Affairs. Family characteristics data are from the Danish Civil Registration System (CPR). Robust standard errors are in parentheses.

Explanatory Variable	Dependent Variable: Changes in Profitability			
	(I)	(II)	(III)	(IV)
<i>Gender of the first born child is male</i>	-0.0085 *** (0.0029)	-0.0083 *** (0.0029)	-0.0093 *** (0.0034)	-0.007 ** (0.0028)
<i>Ln assets</i>			-0.0013 * (0.0007)	-0.0006 (0.0007)
<i>Firm age</i>				0.000 (0.0001)
<i>Industry adjusted EBIT/Assets, t=-1</i>				-0.2996 *** (0.0124)
Year controls	No	Yes	Yes	Yes
Industry adjusted profitability	Yes	Yes	Yes	Yes
Number of observations	8,258	8,258	8,258	8,258

***, ** and * denote significance at the 1, 5 and 10 percent level, respectively.

TABLE VII. FIRM PERFORMANCE AND FAMILY SUCCESSIONS: INSTRUMENTAL VARIABLES

Family CEO in an indicator variable equal to one when the entering CEO is related by blood or marriage to the departing CEO, zero otherwise. The instrumental variables are: the gender of the first-born child of a departing CEO (1=male, 0=female) in all columns and additionally, the number of male children of the departing CEO in Column V, and the total number of children in Column VI. The dependent variable is the change in firm profitability around CEO successions. Firm profitability is defined as EBIT / Assets or the ratio of operating (ordinary) income to the book value of total assets minus the average of its four-digit NACE (European industry classification system) benchmark. Changes in profitability are computed as the difference between the average three-year post-succession profitability minus the three-year average before transition. The year of succession is omitted. *Ln assets* is the natural log of the book value of assets at the time of succession. Firm age is the difference between the year of succession and the oldest of: the year of establishment, the year of registration or the year of by-laws. Industry adjusted EBIT to Assets ratio based on four-digit NACE (European industry classification system) benchmarks the year prior the CEO transition. CEO successions and firm data are from *Købmandsstandens Oplysningsbureau's* (KOB) dataset, which is based on firms' annual reports to the Danish Ministry of Economics and Business Affairs. Family characteristics data are from the Danish Civil Registration System (CPR). Robust standard errors are in parentheses in Columns (I) to (VI). Estimated coefficients in Columns (III) through (VI) are from a two-stage least square regression. Results in Column VII are from an ordinary least square first stage and a median second stage regression; standard errors are in parentheses.

Explanatory Variable	Dependent Variable: Changes in Profitability around CEO Successions						
	OLS	OLS	IV	IV	IV	IV	IV
	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)
<i>Family CEO</i>	-0.0083 *** (0.0027)	-0.0078 *** (0.0029)	-0.1157 *** (0.0430)	-0.0989 ** (0.0411)	-0.0637 ** (0.0292)	-0.0695 ** (0.0318)	-0.0649 ** (0.0322)
<i>Ln assets</i>	-0.0011 * (0.0007)	-0.0009 (0.0007)		-0.004 ** (0.0016)	-0.0028 ** (0.0012)	-0.0030 ** (0.0013)	-0.0016 (0.0013)
<i>Industry adjusted EBIT/Assets, t-1</i>	-0.3011 *** (0.0115)	-0.2981 *** (0.0124)		-0.2762 *** (0.0162)	-0.2847 *** (0.0144)	-0.2833 *** (0.0147)	-0.3037 *** (0.0112)
<i>Firm age</i>	0.0000 (0.0001)	0.0000 (0.0001)		0.0001 (0.0001)	0.0001 (0.0001)	0.0001 (0.0001)	0.0000 (0.0001)
Year controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	9,511	8,258	8,258	8,258	8,258	8,258	8,258

***, ** and * denote significance at the 1, 5 and 10 percent level, respectively.

TABLE VIII. ALTERNATIVE WINDOWS OF ANALYSIS AND SUB-SAMPLES

Family CEO is an indicator variable equal to one when the entering CEO is related by blood or marriage to the departing CEO, zero otherwise. The instrumental variable is the gender of the first-born child of the departing CEO (1=male, 0=female). The dependent variable is the change in firm profitability around CEO successions. Firm profitability is defined as EBIT / Assets or the ratio of operating (ordinary) income to the book value of total assets minus the average of its four-digit NACE (European industry classification system) benchmark. *Pre-transition* change in profitability in Column I is computed as the difference between the average three-year profitability after year $t=-3$ minus the three-year average before, where the year $t=-3$ is omitted. *Transition* changes in profitability in Columns II, IV, V, VI and VII are computed as the difference between the average three-year post-succession profitability minus the three-year average before transition, where the year of succession is omitted. *Post-transition* change in profitability in Column III is computed as the difference between the average three-year profitability after year $t=+3$ minus the three-year average before, where the year $t=+3$ is omitted. The number of observations in Column I, II and III reflect the number of firms with available data for the relevant analysis. Column IV reports results for firms where the departing CEO's age was between 55 and 65 years of age. Column V (VI) reports results for firms whose departing CEO left at a younger (older) age than the median age of the sample. Column VII presents results for observations where the departing CEO died at the time of transition. All specifications include the following controls (estimated coefficients are not reported): $\ln assets$, the natural log of the book value of assets at time t . Firm age is the difference between year t and the oldest of: the year of establishment, the year of registration or the year of by-laws. Industry adjusted EBIT to assets at time $t=-1$, defined as the lagged firm industry adjusted profitability. CEO successions and firm data are from *Købmandsstandens Oplysningsbureau's* (KOB) dataset, which is based on firms' annual reports to the Danish Ministry of Economics and Business Affairs. Family characteristics data are from the Danish Civil Registration System (CPR). All results are from a two-stage least square regression. Robust standard errors are in parentheses.

Dependent Variable: Changes in Profitability							
	Pre- Transition	Transition	Post- Transition	Departing CEO Age (55,65)	Departing CEO Age < Median	Departing CEO Age ≥ Median	Departing CEO Death
	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)
Family CEO	0.0074 (0.0484)	-0.0989 ** (0.0411)	-0.0232 (0.0793)	-0.1003 ** (0.0404)	-0.1401 (0.1008)	-0.0869 ** (0.0410)	-0.1441 (0.1314)
Year controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry adjusted profitability	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	4,572	8,258	3,078	2,776	4,020	4,238	828

***, ** and * denote significance at the 1, 5 and 10 percent level, respectively.

TABLE IX. INTERACTIONS

Family CEO in an indicator variable equal to one when the entering CEO is related by blood or marriage to the departing CEO, zero otherwise. The instrumental variable is the gender of the first-born child of the departing CEO (1=male, 0=female). The dependent variable is the change in firm profitability around CEO successions. Firm profitability is defined as EBIT / assets or the ratio of operating (ordinary) income to the book value of total assets minus the average of its four-digit NACE (European industry classification system) benchmark. Changes in profitability are computed as the difference between the average three-year post-succession profitability minus the three-year average before transition. The year of CEO succession is omitted. *Family CEO-prevalent (board-prevalent)* industry is an indicator variable equal to one if an industry is above the median in terms of prevalence of family CEO transitions (the share of family members in firms' boards), zero otherwise. *Mature* industry is an indicator variable equal to one if an industry is below the median in terms of production growth between 1990 and 2002, zero otherwise. *Dynamic entry* industry is an indicator variable equal to one if an industry is below the median in terms of firm age, zero otherwise. *R&D-intensive* industry is an indicator variable equal to one if an industry is above the median in terms of spending in research and development relative to the value of production, zero otherwise. *Concentrated industry* is an indicator variable equal to one if an industry Herfindahl-Hirschman Index in 1992 (asset shares) is above the median, zero otherwise. All specifications include the following controls (estimated coefficients are not reported): Ln assets, firm age and industry adjusted EBIT to assets at time t=-1. CEO successions and firm data are from *Købmandsstandens Oplysningsbureau's* (KOB) dataset, which is based on firms' annual reports to the Danish Ministry of Economics and Business Affairs. Family characteristics data are from the Danish Civil Registration System (CPR). Data from production growth and R&D intensity by industry is from the OECD. All results are from two-stage least square regressions. Robust standard errors are in parentheses.

Dependent Variable: Changes in Profitability						
	(I)	(II)	(III)	(IV)	(V)	(VI)
Family CEO	-0.1620 ** (0.0700)	-0.1204 ** (0.0568)	-0.1218 *** (0.0467)	-0.0880 ** (0.0388)	-0.0801 (0.0657)	-0.0906 ** (0.0387)
"Family CEO-prevalent" industry * family CEO	0.0762 ** (0.0356)					
"Family board-prevalent" industry * family CEO		0.0323 (0.0249)				
"Mature" industry * family CEO			0.0383 *** (0.0129)			
"Dynamic entry" industry * family CEO				-0.0297 ** (0.0139)		
"R&D-intensive" industry * family CEO					-0.0763 ** (0.0299)	
Concentrated industry * family CEO						-0.0367 ** (0.0182)
Year controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry adjusted profitability	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	8,258	8,227	7,692	2,776	2,106	8,258

***, ** and * denote significance at the 1, 5 and 10 percent level, respectively.