

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 the impact of family characteristics in corporate decision making, and 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). The paper uses variation in CEO succession decisions that result from the gender of a departing CEO's first-born child. This is a plausible instrumental variable (IV) as male first-child firms are more likely to pass on control to a family CEO relative to female first-child firms, but the gender of a first child is unlikely to affect firms' outcomes. We find that family successions have a large negative causal impact on firm performance: operating profitability on assets falls by at least four percentage points around CEO transitions. Our IV estimates are significantly larger than those obtained using ordinary least squares. Furthermore, we show that family-CEO underperformance is particularly large for firms in high-growth industries and for relatively large firms. Overall, the empirical results demonstrate that professional non-family CEOs provide extremely valuable services to the organizations they head.

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Family firms have gained increasing attention in the economics and finance literature as recent research has shown that the majority of firms around the world are directly controlled by their founders or their founders' descendants (La Porta, Lopez-de-Silanes, and Shleifer, 1999; Morck, Stangeland, and Yeung, 2000; Claessens, Fan, and Lang, 2000; Faccio and Lang, 2002). Even in the United States where firm ownership is widely dispersed (Berle and Means, 1932), founding families own and control a significant number of large publicly held firms. Among firms in the Standard and Poor's 500 index, founding family involvement prevails in at least one-third of them (Anderson and Reeb, 2003).

One of the most contentious issues surrounding family firms relates to chief executive officer (CEO) succession decisions. CEO transitions are likely to play a key role in determining firms' prospects, and they are arguably influenced by the preferences of controlling families, which often struggle between hiring a family or an unrelated CEO.

From a theoretical perspective, the impact of family CEOs on performance is ambiguous (Donnelley, 1964). Family CEOs could perform better than other managers because they are exposed to higher non-monetary rewards associated with the firms' success that other CEOs do not share (Kandel and Lazear, 1992; Davis et al., 1997). They are also argued to have hard-to-obtain firm-specific knowledge and higher levels of trust from key stakeholders (Donnelley, 1964). Further, family managers might have a long-term focus that unrelated CEOs lack (Cadbury, 2000). In contrast, family CEOs might underperform due to the stiff tensions between family and business objectives (Christiansen, 1953; Levinson, 1971; Barnes and Hershon, 1976; Lansberg, 1983) and, perhaps most importantly, due to the fact they are selected from a small pool of managerial talent (Burkart, Panunzi and Shleifer, 2003; Pérez-González, 2006).

The controversy has deepened in light of recent research that has shown large declines in firm performance around family-CEO appointments (Pérez-González, 2006) which led to significant underperformance of heir-controlled firms relative to firms managed by non-family

CEOs (Morck et al., 2000; Pérez-González, 2006; Villalonga and Amit, 2006).¹ Furthermore, the consequences of allocating assets to arguably inferior managerial talent can potentially extend beyond family firms, hurting aggregate total factor productivity and economic growth (Morck et al., 2000; Caselli and Gennaioli, 2004; Bloom and Van Reenen, 2005).

An important concern with pre-existing studies on the impact of family or family-heir status on firm performance is that they rely either on pure cross-sectional variation in family-CEO status (Morck et al., 2000; Villalonga and Amit, 2006; Bloom and Van Reenen, 2005), or on changes in family-CEO status around management turnover (Pérez-González, 2006), both of which are unlikely to be random.² As a result, it has been challenging to establish whether family CEOs do indeed hurt firm performance.

The objective of this paper is to isolate the causal effect of family CEOs on firm performance. To this end, we use heterogeneity in the outgoing CEOs family characteristics as a plausible source of exogenous variation in management succession decisions. To the best of our knowledge this is the first paper that seeks to establish the causal effect of family-CEOs on firm performance.

To assess this question empirically we construct a dataset that contains accounting and management information for the universe of limited liability firms in Denmark. Our dataset is unique because we are able to link top managers in the sample to their family information in the Danish Civil Registry (CPR). The CPR archives contain information related to individuals' marital histories and children, which allow us to construct detailed CEOs' family trees.

Using this dataset we are able to replicate the difference-in-differences (DD) result that firms that promote a family, relative to an unrelated CEO, underperform (Pérez-González, 2006).

¹ Beyond the focus of family descendants, the impact of family firms on performance has been previously examined by Morck, et al. (1988), Yermack (1996), McConaughy, et al. (1998) and Anderson and Reeb (2003), with mixed results.

² Family status and low performance ex-post could be explained, for example, by an endogenously determined board that is optimally weak (Hermalin and Weisbach, 1998) and mean-reversion. Alternative, by omitted variables such as, anti-takeover provisions (Gompers, Ishii, Metrick, 2003).

Yet as anticipated above, an important drawback of the least-squares DD estimator is that it is subject to endogeneity and omitted variables problems. For example, even when family and unrelated CEOs are equally competent, the DD estimator might erroneously attribute differential improvements in investment opportunities to a gap in CEO abilities.

To overcome these concerns, we study the impact of family CEOs on firm performance using instrumental variables (IV). We focus on variation in CEO succession decisions arising from heterogeneity in the outgoing CEO's family characteristics. As Bertrand et al. (2005), we find that family size and marital history affect both the decision to appoint family (unrelated) CEOs, as well as which family member (child, spouse, etc) is promoted. Using these variables as instrumental variables is, however, potentially problematic if these characteristics respond to economic incentives (Becker, 1981).

Consequently, we instrument for family successions using a family trait that is likely to be randomly assigned: the gender of the first-born child of a departing CEO.³ The gender of the first child is a plausible instrument for family successions because it affects the probability of observing a family succession (primogeniture), and because it is unlikely to be correlated with firms' prospects. For departing CEOs in the sample it is likely to be determined by nature: over 80 percent of first-child births occurred prior to 1980, before current techniques to identify the gender of children were widespread. Moreover, there is no evidence that we are aware of related to a "missing women" problem (Sen, 1992) in Denmark.

We show 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 29.4 percent when the first-born child is female and increases to 39 percent (a 32.7 percent increase) when the first-born is male. This difference is statistically significant at the one-percent level.

³ The paper also provides results for alternative instruments such as the number of male children or the ratio of male to total children.

We also investigate whether firm or family characteristics differ for first-male relative to first-female firms at the time of CEO succession. We find that firms' profitability, age, and size do not differ statistically as a function of the gender of the first child. Moreover, the family characteristics of departing CEOs are comparable across groups: the number of children, spouses, and even the divorce rate are not significantly different for first-male or female child firms. These results provide evidence that supports the notion that the gender of the first child is unlikely to affect firms' performance through other firm or family channels.

Following the CEO turnover literature (Denis and Denis, 1995; Huson, Malatesta, and Parrino, 2004; Pérez-González, 2006), our main variable of interest is the change in operating return on assets (OROA) around CEO succession decisions. In assessing differential performance around CEO transitions, we adjust OROA using industry- and industry-and-performance-matched benchmarks to control for industry-wide trends and for potential mean-reversion in accounting variables (Barber and Lyon, 1996).

Our main finding is that family successions are significantly negatively correlated with firm performance around CEO successions. The relationship between family successions and firm performance is extremely strong and economically large: family CEOs cause an average decline in firm profitability on assets of at least four percentage points. IV results are significantly larger than those obtained using OLS, which might point to large biases in OLS estimates. Heir-underperformance is robust to the inclusion of an array of controls for firm characteristics that have been found in the literature to affect firms' prospects around succession. Moreover, the results are not explained by mean-reversion in firm performance.

While the gender of the first child is likely to provide exogenous variation in terms of the identity of incoming CEOs, the timing of successions is not random. We test for differences in pre- and post-CEO transition changes in performance and we fail to find significant differences in performance across groups prior to CEO transitions. Further, we do not observe family-CEO firms recovering after CEO transitions, bolstering the case for the causal interpretation of our findings.

To further address potential concerns related to the timing of transitions, we instrument for family CEOs using the death of departing chief executives around succession as an instrument (Johnson et al., 1985). Deaths provide likely exogenous variation in the timing of succession, yet they might raise concerns related to the exclusion restriction. Deaths can affect firms and families through channels other than the identity of a CEO replacement. We find that using deaths as an alternative instrument, however, leads to the same conclusion: family CEOs hurt firm profitability.

Another concern with the above-described results is that they might be explained by reported and not real differences in performance. Family CEOs might be prone to divert firms' cash flows to the controlling family relative to unrelated CEOs, even when the core operating performance of the two groups of firms is identical. We test for this empirically by examining whether the results are explained by firms that lack a formal board of directors, or by small firms, which presumably are more susceptible to such behavior. We show that this is not the case.

The superior performance of unrelated CEOs might instead be explained by changes in the governance structure of firms around CEO transitions and not by managerial ability. That would occur if, for example, acquisitions accounted for a significant share of unrelated transitions. We show that family CEOs underperform relative to unrelated managers even when the departing CEO's family remains on the board of directors after transition.

We also examine whether industry characteristics that might be associated with differential costs of employing a "professional" rather than a family CEO affect our findings. We find that family CEOs tend to be costlier in fast-growing industries, where presumably, managerial skills are more valuable. Conversely, we do not find a statistically significant gap in performance for firms that promote family CEOs in industries where family succession concentration is high relative to the sample. Failing to find significant differences in performance in this latter group might also help to explain the gap between OLS and IV estimates. IV bases its estimates on firms that promote a family CEO due to the gender of the first child. By *randomly* selecting family CEOs, the IV would under represent those industries where family CEOs are normally present relative to OLS.

An alternative way to interpret our findings 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 head.

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 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-born 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 (1981), and to the large body of work in economics that links the gender of offspring to various economic decisions (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 for 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. Section I describes the data and presents summary statistics. Section II outlines our empirical strategy. Section III presents the main results of the paper and Section IV concludes.

I. Data Description and Summary Statistics

We construct a dataset with 5,334 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 departing and incoming chief executive officers. The dataset was constructed based on three different sources as explained below:

1. Financial and management information are from *Købmandsstandens Oplysningsbureau* (KOB). KOB is a dataset assembled by a private firm using the annual reports that all limited liability firms are required to file at 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 only mandate disclosure of firms' assets and measures of firm profitability such as operating or net income. Other firm-level variables such as sales or employment are not required, although some firms do provide them voluntarily. Management data include the names and position of executives and board members. All firms are required to report management information.

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. Given our focus on changes in firm performance around CEO transitions, for our analysis, we only require that reporting biases are consistent at the firm-level.

2. Individual and family data about departing and incoming CEOs are from the official Danish Civil Registration System (CPR). These records include the personal identification number (CPR), (equivalent to the U.S. social security number), the name, gender, and dates of birth and death of all Danish citizens. 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.

3. To match the names of top management reported in KOB with 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 ES), at the Ministry of Economic and Business Affairs. The ES dataset reports both the names and CPR numbers of management and board members of all limited liability corporations. Under Danish corporate law firms are required to file with ES any change in CEO or board positions within two weeks of the actual date of occurrence.

Based on this procedure, we match around 90 percent of all managers involved in successions. In addition, despite the fact that women often drop their maiden names after marriage, we are able to match men and women equally well. We do it by using women's family trees to reconstruct their maiden names as well as other names they had in previous marriages.

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 the ES dataset. Third, we required that matching financial information from KOB was available around CEO transitions and that firm employment, where available, was not zero. Fourth, we retained the first CEO transition per firm.

Firm Characteristics

Table I presents summary statistics of the firms in the sample both as a group (Column I), and classified 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.

The first row in Table I shows the natural logarithm of total assets for the firms in the sample. Not surprisingly, firms that undergo family successions are relatively smaller than those firms that select unrelated CEOs. On average, family succession firms had 2000 Danish Krone (DK) 11.2 million or USD \$1.4 million in assets.⁴ In contrast, firms that selected unrelated CEOs had on average DK64.4 million or USD \$8.0 million in assets. The difference in firm size is significant at the one-percent level.

Given that regulations only mandate disclosure of firms' assets and measures of profitability such as operating and net income, in Table I we scale operating and net income using the book value of assets in order to present comparable measures of firm performance at the time of CEO transitions. Operating return on assets (OROA) is measured as the ratio of earnings before interest and taxes (EBIT) to the book value of assets. Average OROA is 6.5 percent for all firms in the sample. Splitting firms by the family links of the departing CEO we find that firms that experience family successions are, on average, more profitable than those firms that promote unrelated CEOs: 7.4 and 6.1 percent, respectively. The difference of 1.3 percentage points is significant at the one-percent level.

In Table I we also present the ratio of net income to assets, calculated using after-tax profits relative to the book value of assets. The average net income to assets is 3.3 percent, and as before, family CEO firms are more profitable than non-family CEO firms at the time of succession. The difference is 0.7 percent, significant at the 10-percent level.

⁴ The average exchange rate in 2000 was equivalent to 8.08 Krone per U.S. dollar (*World Development Indicators*).

In Table I we also present industry-adjusted measures of OROA. Industry averages are calculated using equally weighted averages of the relevant variable and industry in a given year for all firms in the KOB file, including those firms that do not experience a CEO transition. For each industry control we require that at least 20 non-event firms exist in any given year. We favor four-digit industry (NACE, European industry classification system) controls and move to two-digit if the 20-firm restriction is not satisfied with four-or three-digit groupings.

Industry-adjusted OROA shows that the difference in profitability for family and unrelated CEO firms is not driven by industry characteristics: the difference is 1.4 percentage points, comparable to the difference obtained using unadjusted OROA. Finally, Table I shows that firms in the sample do not systematically differ as a function of age.

Overall, Table I shows that 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. Moreover, to the best of our knowledge, we are the first to provide a comprehensive view of family CEO successions in an economy as prior work has focused on analyzing the characteristics of these firms using data from publicly traded corporations (for example, Morck et al., 2000; Pérez-González, 2006; Villalonga and Amit, 2006).

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 transitions when classified as *family* (Columns II and III) or *unrelated* (Columns IV and V) successions. As in Table 1, family categories reflect whether the incoming CEO is related by blood or marriage to the departing CEO. Also, we further breakdown family successions into *family-children* transitions when the incoming

CEO is the child of the departing CEO (Columns VI and VII) and *family-others* when the incoming CEO is related, but not an offspring of the outgoing CEO (Columns VIII and IX).

Family successions occur in 1,776 out of 5,334 CEO successions (33.3 percent). Column VI shows that, out of the 1,776 family transitions, 863 (48.6 percent) involve the children of the departing CEO. Given that firms in our dataset are mostly privately held firms, 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 diminish the relative attractiveness of family CEOs (Burkart et al., 2003).

In Table II, Panel A we document that the marital history of CEOs can potentially affect both the choice of family or unrelated CEOs and whether children are chosen for the CEO position. We show that family successions are 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, have had more than one spouse. For this group, it is 10.7 percentage points or 29.7 percent lower than in the case of firms in which the departing CEO has had only one spouse, a difference that is significant at the one-percent level. Panel A also shows that this difference is driven by a reduction in the frequency with which children gain the top post (Column VII) and not by the change in the probability that other family members get promoted (Column IX).

In Panel B we show the frequency of family successions as a function of 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 41.3 percent for those with three children. The associated difference of 12.2 percentage points is significant at the one-percent level and it represents an increase in the probability of a family transition of 41.9 percent. In addition, we find that the rate of increase in this frequency falls with

the number of children. Specifically, moving from three to four children does not increase the share of family transitions.

Family firms seem to exhibit a preference for children relative to spouses, parents, or siblings at the time of succession. In Table II Panel B we observe that firms in which the departing CEO has one child appointed a child-CEO in 11.9 percent of the successions. By construction this ratio was zero when departing CEOs had no children. Interestingly, when we compare the share of non-children family CEOs for one-and no-children departing CEOs, we observe that the frequency with which other family members are promoted to the CEO position decreases by 7.5 percentage points in the first child. This decline is significant at the one-percent level. As a result, children crowd out other members of the family.

In Table II Panel C we explore the correlation between the ratio of male to total number of children and succession decisions. We report that firms in which more than 50 percent of the outgoing CEO's children are male are 10.8 percentage points more likely to have a family successor than firms in which less than half of the children are male. The difference is significant at the one-percent level.

Although Panels A, B and C show a strong correlation between family characteristics and the probability of family successions, it is difficult to assert whether family characteristics determine CEO succession decisions. The correlation between the number of children and family CEOs might be explained, for example, by omitted variables such as the departing CEO's preference for a large and close family. Of the family characteristics described above, an attractive feature of the gender ratio is that it is partly exogenous: departing CEOs might not control the gender of a given child. The ratio is, however, endogenous because individuals can affect its variance through their choice of family size: it would tend to converge to 50 percent as the number of children increases.

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 the decision to promote a family CEO and a family trait that is likely to be random, namely, the gender of the first-born child of a departing CEO. For departing CEOs in the sample, the gender of the first-born child is likely to be determined by nature 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 9.6 percentage points more likely to be succeeded by a family member than their counterparts whose first-born child is female. The difference is significant at the one-percent level. Moreover, Column VII shows that this difference is driven by changes in the probability of children of the outgoing executive getting the top position. Interestingly, Column IX shows that the gender of the first child does not affect the frequency with which other relatives get the CEO position.

These correlations are consistent with anecdotal evidence that male children are preferred to females at the time of succession. The magnitude of the difference (32.7 percent) might appear large given that Denmark is a country with a high overall level of gender equality (it ranks fourth among 58 countries surveyed by the World Economic Forum) and one of the highest female labor force participation rates in the world.⁵ 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.⁶

⁵ 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.

⁶ See <http://www.dst.dk/HomeUK/Statistics/ofs/Publications/Yearbook> (Table 136).

Having shown that a family trait that is arguably exogenous affects the decision to name a family CEO we now turn to describing our empirical strategy to investigate the consequences of family CEOs on firm performance.

II. Empirical strategy

A simple way to evaluate the impact of family CEOs on firm performance is to estimate the difference in firm profitability around CEO successions, and assess the way in which firms' outcomes change as a result of the management transitions. This difference 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 concern with this approach is that it can potentially fail to control for aggregate changes in performance due to, for example, industry or aggregate trends, succession-specific shocks, or mean-reversion in performance measures.

Common solutions to this problem include adjusting the measures of profitability using industry or industry-and-performance benchmarks (Barber and Lyon, 1996) and using a difference-in-differences analysis, relative to a control group. In this case, 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 an unrelated CEO as described below:

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

where y_i is the difference in performance around 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.

A fundamental 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 not be correlated with firms' determinants of performance. This assumption is challenging as succession decisions are likely to incorporate firms' prospects. To overcome this problem we use instrumental variables (IVs).

We use the gender of the first-born child of a departing CEO of a corporation to instrument for whether a new CEO is a family or an unrelated CEO. Specifically, our first-stage regression is:

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

where $famCEO_i$ is an indicator variable equal to one if the incoming CEO is related by blood or marriage to the departing CEO, zero otherwise. Here $genderfirst$ is an indicator variable that is equal to one if the first child is male, zero 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:

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

where y_i is defined as in (1) and $fam\hat{CEO}_i$ are predicted values from (2). We are interested in c_3 , which captures the direct effect of a family succession on performance.

An example

To illustrate the differences in the two approaches above, and the advantages of using instrumental variables 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 OLS-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 (or board of directors which, for private firms, are likely to be dominated by the departing CEO) is to choose a family successor. Also, suppose that 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 this decision rule, family (unrelated) successions would never occur under low (high) quality of new projects and thus the OLS 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 OLS estimate in this example would have an upward bias.⁷ Graphically, OLS

⁷ 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 logic of the example above, the sign of the bias would change depending on whether family CEOs coincide with lower or higher investment prospects.

compares the changes in performance of family successions, which tend to occur in the upper part of the table above, to unrelated successions, which tend to happen in the lower part of that table.

The instrumental variables (IV) approach, in contrast, starts by using information on all CEO successions conditional on the gender of the first-born child and it 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. Note that, 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. Thus, in this example, the IV estimator uses only the information of the group with medium investment opportunities. This is a general result: estimates from instrumental variables use only the information of the group of firms that respond to the instrument (Imbens and Angrist, 1994). Finally, as it can be seen from the table, the IV estimator is not contaminated by differences in investment opportunities because they are constant for all the firms in the moderate category.

The example above highlights the advantages of using instrumental variables, namely, that the IV 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).

Gender of the First-Born Child: Firm and Family Characteristics and the Exclusion Restriction

As argued above, a valid instrumental variable requires meeting two criteria. First, it should affect the probability of observing a family succession, which we show in Table II Panel D, and it should not affect firm performance through other channels except for its direct effect on CEO succession decisions. In Table III we explore the correlation of the gender of the first child of a departing CEO and an array of firm and family characteristics.

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 first-male or first-female children. 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 is that the gender of the first child might have a direct effect on family characteristics, which might in turn be affecting performance. For example, 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. Family size could in turn affect firm performance, but its effect would be attributable to our instrument. To assess 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 rates as a function of the gender of children (larger for males), male first children might affect the departing CEOs' marriage decisions and potentially marriage could directly affect firms' prospects. If this effect were present in this sample, the IV strategy would be incorrectly attributing this effect to CEO talent. However, Table III shows that the fraction of outgoing CEOs who are divorced is not statistically different for departing CEOs with female or male first children. Moreover, the last line of Table III shows that the total number of spouses that the outgoing CEO has had is no different for these two groups.

Furthermore, Table II Panel D highlighted that there is no significant difference in the share of non-children family CEO for first-male or female child firms, which suggests that first-male firms do not differ in the degree of participation of non-children relatives.

In sum, based on Table III we find no evidence that firm or family characteristics 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 arguably uncorrelated to firms’ outcomes other than through its impact on CEO succession decisions.

III. Results

III.A. Ordinary Least-Squares Difference-in-Differences

To analyze the relative performance of family CEOs and despite the shortcomings highlighted in the previous sections of an ordinary least-squares difference-in-differences (DD) specification, we present basic DD results as a benchmark.

Table IV Panel A presents results using industry-adjusted operating return on assets (OROA) for a three-year window before and after CEO transitions. Column I indicates that firms that experience CEO transitions exhibit lower than average profitability before succession. After transitions, however, they outperform their industry peers. The increase in performance is 0.8 percentage points, which is significant at the one-percent level. An average increase in performance around CEO transitions is consistent with previous studies in the CEO turnover literature (Denis and Denis, 1995; Huson et al., 2004).

When we compare profitability levels prior to family and unrelated successions (Columns II and III, respectively), we find that family (unrelated) transitions tend to occur in firms with above-(below-) average OROA. Prior to CEO transitions, the difference in profitability between these groupings is 1.6 percentage points, significant at the one-percent level.

Examining within-group variations in performance we find that firms that promote family CEOs do not exhibit significant differences in performance around successions. In contrast, firms

that promote external CEOs observe improvements in profitability of 1.3 percentage points, an increase that is significant at the one-percent level.

As a result, the average DD estimates suggest family successions are associated with lower profitability of 1.41 percentage-points relative to unrelated successions. This decline is equivalent to 21.7 percent of the average unadjusted OROA. The estimated gap in profitability is similar in magnitude to that found by Pérez-González (2006) using data from U.S. publicly traded firms.

In Table IV panel B we present the relative impact of family and unrelated CEOs using alternative measures of firm performance. To investigate whether the decline in performance around family transitions is due to firm or industry effects, the first row shows unadjusted OROA as the performance measure and the second row presents industry-adjusted OROA as in Panel A. For both measures the profitability of firms undergoing a family transition drops relative to other firms. One difference is that unadjusted measures suggest that the main effect is driven by a decline in performance of family CEOs while the adjusted OROA shows it is driven by gains in profitability in unrelated-CEO firms. Median differences in unadjusted and industry-adjusted OROA indicate that the gap across groups is unlikely to be driven by outliers.

To test whether the results might be explained by mean-reversion relative to pre-transition performance we also report changes in industry-and-performance adjusted OROA (Barber and Lyon, 1996). This measure is constructed using as a control firms in the same industry-adjusted performance decile grouping in the year prior to succession. The third row of Panel B shows that results are negative and significant at the one-percent level even after controlling for this effect. Also, using net income to assets obtains similar conclusions.

The last two rows of Table IV Panel B test for differences in the natural logarithm of assets and net sales to determine whether the gains in profitability for unrelated CEO are a result of declining assets or increased profits. The results indicate that unrelated successors increase the asset base more than family CEOs and that, unlike family heirs, they are able to increase revenue relative to pre transition levels.

Overall, difference-in-differences results indicate a robust result: family CEOs underperform relative to unrelated CEOs. The results hold regardless of the measure of performance used for both mean and median differences. Yet it is difficult to establish causality. Results might be explained by omitted variables that account for both the decision to promote a family CEO and lower performance around transitions.

III. B. Instrumental Variables

Given that the main objective of this paper is to isolate the causal effect of family CEOs on firm performance, we now turn to estimate the effect of family CEOs on firm performance using instrumental variables.

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 with a family transition. Firms whose departing CEO had a male first child are 9.6 percentage points more likely to appoint a family CEO 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 32.7 percent. Moreover, the F -statistic of 48.1 suggests that the gender of the first child is unlikely to be a weak-instrument. 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).

One concern with the gender of the first-child indicator variable is that its variation might be capturing the effect of having a male child, a trait that families could partially affect by having more children, rather than the effect of the first born child whose gender is presumably random. To investigate this possibility we include in Column II a dummy variable indicating whether the departing CEO has a male child. Not surprisingly, the coefficient of the gender of the first-child dummy falls significantly to four percentage points. Yet the gender of the first-child indicator variable continues to be economically large and significant at conventional levels.

It is important to stress that even though the male-child indicator variable is strongly positively correlated with family CEO appointments, it is difficult to convincingly claim that it meets the exclusion restriction. Families can affect the odds of having a male child by having more children. Similarly, while the number of male children is likely to be affected by firm characteristics we also report first-stage results based on it and based on the ratio of male to total children in Columns III and IV for reference.

In Column V we present an alternative specification using the gender of the first child as instrument and firm age and year dummies as added controls. In Column VI we further control for size and lagged industry-adjusted OROA and in Column VII we use lagged industry-and-performance-adjusted OROA as a control. As suggested in Table I, the 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 family transitions. In all cases, the point estimate on the gender of the first-child indicator variable hardly changes.

First-stage results indicate that the gender of the first child has a strong impact on firms' succession decisions. Moreover, the robustness of its estimated coefficient to the inclusion of firm characteristics suggests that the effect of the gender of the first child of family CEO appointments is potentially unaffected by firms' characteristics.

Having examined the strong impact of the gender of the first child on family CEO decisions, we turn to analyzing its effect on performance. We start by exploring the reduced-form correlation between the instrument and difference in firm OROA 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 male first child. The estimated coefficients show that the group of firms in which the departing CEO's first-born child is male experience an average drop in OROA in the range of 0.8-1.2 percentage points, relative to female-first child firms (Columns I, V, VI, and VII). In all cases, the

reduced-form correlation is significant at the five-percent level. For reference, we show similar results using alternative *instruments* based on male children controls (Columns II-IV).

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, which might ease some of these concerns. We will revisit these issues in Table VIII.

Reduced-form results provide strong evidence that family successions hurt firm performance. They are arguably free from endogeneity and omitted variable concerns. Yet the magnitude of this difference needs to be scaled to reflect the fact that it is driven by a subset of firms that appointed a family CEO due to the instrument.

In Table VII we examine the impact of family CEOs on performance around CEO successions using alternative specifications. To facilitate the comparison between OLS and IV estimates, in Columns I and II we provide OLS estimates of the effect of family successions on performance. As measures of firm performance, we use industry-adjusted (Columns I-VII) and industry-and-performance adjusted (Column VIII) operating return on assets (OROA).

The estimates in Table VII Column I are comparable to those shown in Table IV, conditional on having at least one child (Table IV shows OLS estimates based on the entire sample). As shown before, family-CEOs are associated with lower performance ex-post. The gap between family and unrelated CEOs is statistically significant at the one-percent level. In Column II we control for size, age, and profitability the year before the succession. OLS estimates suggest that firms that promote family CEOs trail other firms around successions by approximately 0.8 to 1.4 percentage points in terms of profitability. Furthermore, consistent with mean-reversion we find

lower gains in performance for larger firms and for those whose pre transition performance was superior. Firm age does not seem to affect changes in performance around successions.

Columns III through VIII of Table VII present the estimated coefficients using instrumental variables. As anticipated by Table VI, the impact of family CEOs on profitability is negative and statistically significant, regardless of the instrument we use. This result holds when we use the gender of the first child as instrument as well as when we replace it by the number of male children or the ratio of male to total children.

In all cases, the magnitude of the estimated coefficient is larger than the one estimated using OLS, implying a reduction in profitability relative to unrelated transitions of at least six percentage points. 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.

Timing of CEO successions

Even though Table III provides evidence that the first child male-female groupings are comparable prior to succession in terms of size and profitability, a potential concern with the results presented thus far 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 or by differential trends.

In Table VIII we present 2SLS-IV results for alternative windows of analysis before, during, and after CEO transitions. In Column I we examine changes in profitability using a window before the transition, estimated around year $t=-3$. In Column II we replicate the basic specification of Table VII containing a CEO transition, and in Column III we use a post-transition window centered at year $t=+3$. In all cases, changes in performance are computed as the difference in the

three-year average industry-and-performance-adjusted OROA around the key date. Results are computed for all firms with data in each relevant window of analysis.

We fail to find a statistically significant difference between firms that undergo family successions and those that promote unrelated CEOs, except for the window of analysis 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 any family transition do not recover of the decline in performance suffered after succession. The lack of post-succession recovery is evidence of the permanent negative impact of family CEOs.

In Columns IV and V 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 at a "normal" retirement age, that is, between 55 and 70 years of age, as we want to test whether family underperformance is explained by late (early) retirements of founders. We find that normal retirement-age transitions exhibit similar patterns of performance between family and unrelated CEOs compared to the entire sample. Specifically, the estimated gap in performance is 8.4 percentage points, significant at the five-percent level. In Column V of Table VIII we restrict the sample to succession in which the departing CEO leaves the position either before age 55 or after age 70. In this latter case, the estimated coefficient is comparable to that estimated in Column IV. However, the first stage is weaker and the standard errors are twice as large.

An alternative test of the merits of family and unrelated CEOs that is less prone to criticism related to the timing of the transition is, following Johnson et al., (1985), to instrument for family CEOs using an indicator variable equal to one in cases where the departing CEO died in the year of the CEO change. The main advantage of this test is that the timing of the CEO succession is likely to be exogenous as the timing of death tends to be unexpected. Yet CEO deaths can potentially

affect performance through other channels beyond the effect of a family or unrelated CEO. In Table VIII Column VI we present results using this alternative instrument. Consistent with prior findings, we find that family CEOs harm firm performance. The estimated coefficient points to a decline in performance of 3.7 percentage points, significant at the one-percent level.

In the last column in Table VIII, we present results when the sample is restricted to observations in which the outgoing CEO died around management transitions and we use the gender of the first-child instrument. A clear advantage of this specification is that it addresses both concerns related to the endogeneity of the timing of successions as well as concerns related to the exclusion restriction. One disadvantage, however, is that 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 almost four times those in Column II.

Firm and industry characteristics

A different concern is that results might be explained by differences in reported rather than actual performance. Family CEOs might be prone to divert firms' cash flows to the controlling family relative to unrelated CEOs, even when the core operating performance of the two groups is identical. In Table IX, we test for this possibility by examining whether the results are explained by small firms (Column I) or by firms that lack a formal board of directors (Column II). In Denmark, limited liability firms incorporated as ApS corporations (43 percent of the sample) can choose whether to have a board of directors. We show that these less-formal firms do not explain our results. Family-CEO underperformance exists for firms with above-median asset size as well as for firms with a formal board of directors.

The superior performance of unrelated CEOs might alternatively be explained by changes in the governance structure of firms around CEO transitions. For example, non-family CEOs might coincide with acquisitions by larger and more efficient firms. If that were the case the finding of superior performance relative to family CEOs could not be interpreted as the product of outside

managerial talent per se. To test for this possibility and in lieu of our lack of detailed ownership data, we restrict our analysis to firms in which at least one family member of the departing CEO stays on the board post-CEO transition. For this sub sample the economic magnitude and statistical significance of the estimated coefficient is almost identical to what we found for the full sample.

In Columns IV and V we assess the role of industry characteristics in explaining the differential performance of family and unrelated CEOs. Specifically, we investigate whether this gap in performance differs in industries where family CEOs are relatively more common and presumably better suited for their positions. We perform the analysis on the sub sample of firms in industries with above-median concentration of family firms (Column IV). As expected, the negative impact of family transitions is mitigated. The point estimate is negative, although the coefficient is not statistically different from zero. Failing to find significant differences in performance in this latter case can potentially help to explain the gap between OLS and IV estimates. The latter are based on firms that promote a family CEO due to the gender of the first child. By *randomly* selecting family CEOs, the IV would under represent those industries where family CEOs are normally present relative to OLS.

Finally, we hypothesize that managerial skills are potentially more valuable in certain economic environments, such as rapidly growing industries, where managerial discretion might be relatively more important. In Column V we consider the sub sample of firms in industries with above-median growth, relative to the sample. Indeed, we find that in this sub sample the estimated coefficient is negative and its magnitude is larger than that for the full sample, suggesting that family CEOs tend to be costlier in dynamic environments.

Interpretation

In this paper we are explicit about the source of variation in family-CEO appointments we use to examine the impact of family CEOs on firm performance. Given that the variation from the

gender of the departing CEO's first-born child is likely to be uncorrelated to firms' prospects, 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 head. They also demonstrate that primogeniture rules which dictate who gains access to the helm of a firm based on birth order or gender, but not competence, can have large and negative 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, since non-controlling investors do not enjoy 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 responds to the IV, and as such, the results of this paper are only representative for those firms whose succession decisions are affected by it (Imbens and Angrist, 1994). In particular, one might posit that the sub sample of family CEOs who are promoted due to the instrument are of a lower average quality relative to the pool of family CEOs that gain control irrespective of it. If that were the case, the average causal effect of family CEOs on performance might not be as large as the results from our instrument document.

IV. 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 have economically large effects on the decision to promote a family or an unrelated CEO. We addressed this question using a family trait that is likely

to be exogenous: the gender of the first child born to a departing CEO. In particular, we found that first-male firms are 32.7 percent more likely to appoint a family CEO than first-female child firms.

Using the variation in family CEO appointments associated to the gender of the first child, we then showed that family-CEOs have a dramatically large and negative causal impact on firm profitability. Operating return on assets of firms that promote family CEOs falls by at least four percentage points around CEO transitions. Our estimates are significantly larger than prior estimates in the literature and suggest that addressing endogeneity and omitted variables concerns is extremely important for understanding the impact of family firms on firms' outcomes.

Our results provide direct evidence that non-family CEOs are extremely valuable for the firms they lead. Moreover, the finding that family CEOs hurt firm performance might suggest that countries where the control and management of assets is commonly transferred among kin can potentially under-perform compared to 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 shareholders of publicly traded corporations; and private firms are commonly associated with 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 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. Operating return on assets (OROA) is the operating income (*Primært resultat*) to book value of assets. Net income to assets is the ratio of net income (*Årets resultat*) to book value of assets. Industry adjusted OROA is the difference between OROA 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. The table presents firm characteristics at the time of the CEO transition. Firm characteristics are from the *Købmandsstændens 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	8.605 (0.0240) [5,334]	8.232 (0.0332) [1,776]	8.791 (0.0315) [3,558]	-0.559 *** (0.0458)
Operating return on assets (OROA)	0.065 (0.0020) [5,334]	0.074 (0.0032) [1,776]	0.061 (0.0025) [3,558]	0.013 *** (0.0041)
Net income to assets	0.033 (0.0019) [5,334]	0.038 (0.0031) [1,776]	0.031 (0.0024) [3,558]	0.007 * (0.0039)
Industry adjusted OROA	-0.002 (0.0020) [5,334]	0.007 (0.0032) [1,776]	-0.006 (0.0025) [3,558]	0.014 *** (0.0041)
Firm Age	19.417 (0.3106) [5,334]	19.826 (0.4840) [1,776]	19.213 (0.3981) [3,558]	0.613 (0.6267)

***, ** 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 and *family-others*, otherwise. 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 spouses, (B) the number of children, (C) the ratio of sons to the total number of children, and (D) the gender of the first-born child. 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). The table presents firm and family characteristics at the time of the CEO transition. Standard errors are presented in parentheses.

Description	Number of Successions	Type of Succession								
		Family		Unrelated		Family: Children		Family: Others		
		Number	Fraction	Number	Fraction	Number	Fraction	Number	Fraction	
	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)	(IX)	
All	5,334	1,776	0.333	3,558	0.667	863	0.162	913	0.171	
A. Number of spouses:										
0	434	79	0.182	355	0.818	5	0.012	74	0.171	
1	4,282	1,541	0.360	2,741	0.640	802	0.187	739	0.173	
2 or more	618	156	0.252	462	0.748	56	0.091	100	0.162	
Difference (2 or more) minus (1)			-0.107 *** (0.020)				-0.097 *** (0.013)		-0.011 *** (0.016)	
B. Number of children:										
0	642	159	0.248	483	0.752	-	0.000	159	0.248	
1	807	235	0.291	572	0.709	96	0.119	139	0.172	
2	2,397	770	0.321	1,627	0.679	389	0.162	381	0.159	
3	1,152	476	0.413	676	0.587	296	0.257	180	0.156	
4 or more	336	136	0.405	200	0.595	82	0.244	54	0.161	
Difference (1) minus (0)			0.044 * (0.023)				0.119 *** (0.011)		-0.075 *** (0.022)	
Difference (3) minus (1)			0.122 *** (0.022)				0.138 *** (0.017)		-0.016 *** (0.017)	
C. By gender ratio (male/children):										
< 50 percent	1,511	437	0.289	1,074	0.711	161	0.107	276	0.183	
= 50 percent	1,345	451	0.335	894	0.665	248	0.184	203	0.151	
> 50 percent	1,836	729	0.397	1,107	0.603	454	0.247	275	0.150	
Difference (>50%) minus (< 50%)			0.108 *** (0.016)				0.141 *** (0.013)		-0.033 ** (0.013)	
D. By gender of first born child:										
Female	2,216	652	0.294	1,564	0.706	281	0.127	371	0.167	
Male	2,476	965	0.390	1,511	0.610	582	0.235	383	0.155	
Difference male minus female			0.096 *** (0.014)				0.108 *** (0.011)		-0.013 *** (0.011)	

***, ** 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 is male and *female*, when she is 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. Operating return on assets (OROA) is the operating income (*Primært resultat*) to book value of assets. Net income to assets is the ratio of net income (*Årets resultat*) to book value of assets. Industry adjusted OROA is the difference between OROA 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). Departing CEO marital status is divorced is an indicator variable equal to one when the marital status of the departing CEO at the time of the transition is divorced, zero otherwise. Number of spouses of departing CEO is the number of different spouses registered in the Danish Civil Registration System (CPR) that the departing CEO had up to the transition. 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. Family characteristics data are from the Danish Civil Registration System (CPR). The table presents firm and family characteristics at the time of the CEO transition. 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	8.638 (0.0255) [4,692]	8.617 (0.0352) [2,476]	8.662 (0.0369) [2,216]	-0.045 (0.0510)
Operating return on assets (OROA)	0.067 (0.0022) [4,692]	0.066 (0.0030) [2,476]	0.069 (0.0031) [2,216]	-0.003 (0.0043)
Net income to assets	0.035 (0.0020) [4,692]	0.033 (0.0028) [2,476]	0.037 (0.0029) [2,216]	-0.004 (0.0040)
Industry adjusted OROA	-0.0003 (0.0021) [4,692]	-0.0028 (0.0030) [2,476]	0.0024 (0.0031) [2,216]	-0.0052 (0.0043)
Firm Age	19.247 (0.3175) [4,692]	19.307 (0.4370) [2,476]	19.180 (0.4621) [2,216]	0.127 (0.6361)
Number of children of departing CEO	2.236 (0.0127) [4,692]	2.240 (0.0175) [2,476]	2.231 (0.0184) [2,216]	0.009 (0.0253)
Departing CEO marital status is divorced	0.067 (0.0037) [4,692]	0.067 (0.0050) [2,476]	0.067 (0.0053) [2,216]	0.000 (0.0073)
Number of spouses of departing CEO	1.100 (0.0063) [4,692]	1.109 (0.0089) [2,476]	1.091 (0.0087) [2,216]	0.018 (0.0125)

***, ** 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 OROA 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) OROA, (II) industry adjusted OROA, (III) industry and performance adjusted OROA, (IV) industry adjusted net income to assets, (V) natural logarithm of assets, and (VI) natural logarithm of sales. The industry and performance adjustment are computed by subtracting the mean of a control group based on four-digit NACE (European industry classification system) and performance the year prior to the transition. 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 Operating Return on Assets (OROA)

	Type of Succession			
	All	Family	Unrelated	Difference
	(I)	(II)	(III)	(IV)
Before	-0.0032 (0.0016) [5,334]	0.0077 (0.0024) [1,776]	-0.0085 (0.0020) [3,558]	0.0162 *** (0.0031)
After	0.0053 (0.0016) [5,334]	0.0067 (0.0026) [1,776]	0.0046 (0.0020) [3,558]	0.0021 (0.0033)
Difference	0.0084 *** (0.0018)	-0.0010 (0.0028)	0.0132 *** (0.0023)	-0.0141 *** (0.0036)

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)
Operating return on assets (OROA)	-0.0120 *** (0.0028)	0.0035 (0.0023)	-0.0154 *** (0.0036)	-0.0082 *** (0.0027)
Industry-adjusted OROA	-0.0010 (0.0028)	0.0132 *** (0.0023)	-0.0141 *** (0.0036)	-0.0071 *** (0.0027)
Industry and performance adjusted OROA	0.0009 (0.0027)	0.0107 *** (0.0021)	-0.0098 *** (0.0034)	-0.0066 *** (0.0025)
Industry-adjusted net income to assets	-0.0056 * (0.0029)	0.0064 *** (0.0022)	-0.0120 *** (0.0036)	-0.0060 *** (0.0023)
Ln assets	0.0092 *** (0.0022)	0.0300 *** (0.0019)	-0.0208 *** (0.0029)	-0.0050 *** (0.0019)
Ln sales	0.0003 (0.0059)	0.0216 *** (0.0038)	-0.0213 *** (0.0070)	-0.0057 ** (0.0025)

***, **, 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 male is an indicator variable equal to one if the first-born child of the departing CEO is male, zero if she is female. Male child indicator variable is an indicator variable equal to one if the departing CEO has at least one male child, zero otherwise. Number of male children is the number of departing CEOs' male children registered in the Danish Civil Registration System (CPR) at the time of transition. Ratio of male to total children is the ratio of the number of departing CEO's sons to total number of children. *Ln assets* is the natural logarithm 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 OROA is the difference between OROA and the average of its four-digit NACE (European industry classification system) benchmark. Industry and performance adjusted OROA is the difference between the industry adjusted OROA and the average of its control group formed by firms in the same decile grouping of industry adjusted OROA the year prior to succession. 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.

Dependent Variable: <i>Family CEO</i>							
	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)
Gender of the first born child is male	0.0955 *** (0.0138)	0.0404 ** (0.0171)			0.0955 *** (0.0136)	0.0927 *** (0.0135)	0.0936 *** (0.0135)
<i>Male child indicator variable</i>		0.1162 *** (0.0191)					
<i>Number of male children</i>			0.0737 *** (0.0077)				
<i>Ratio male to total children</i>				0.1436 *** (0.0186)			
<i>Ln assets</i>					-0.0448 *** (0.0034)	-0.0515 *** (0.0036)	-0.0508 *** (0.0037)
<i>Firm age</i>						0.0016 *** (0.0003)	0.0015 *** (0.0003)
<i>Industry-adjusted OROA t=-1</i>						0.2446 *** (0.0445)	
<i>Industry-and performance-adjusted OROA, t=-1</i>							0.3374 *** (0.0792)
Year controls	No	No	No	No	Yes	Yes	Yes
<i>F-statistic</i>	48.058	46.566	91.768	59.494	25.590	26.506	24.662
<i>R</i> ²	0.010	0.017	0.019	0.012	0.043	0.053	0.050
Number of CEO transitions	4,692	4,692	4,692	4,692	4,692	4,692	4,692

***, ** 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. In Columns I to VI firm profitability is defined as industry adjusted OROA. Industry adjustment is based on four-digit NACE (European industry classification system) benchmarks. In Column VII firm profitability is defined as industry and performance adjusted OROA. Industry and performance adjustment uses as control group firms in the same decile grouping of industry adjusted OROA the year prior to succession. 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 male is an indicator variable equal to one if the first-born child of the departing CEO is male, zero if she is female. Male child indicator variable is an indicator variable equal to one if the departing CEO has at least one male child, zero otherwise. Number of male children is the number of departing CEOs' sons registered in the Danish Civil Registration System (CPR) at the time of transition. Ratio of male to total children is the ratio of the number of departing CEO's sons to total number of children. *Ln assets* is the natural logarithm 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. 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.

Dependent Variable: differences in operating profitability around CEO Successions (three-year average post succession) - (three-year average pre-transition)							
	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)
Gender of the first born child is male	-0.0120 *** (0.0038)	-0.0123 *** (0.0045)			-0.0121 *** (0.0038)	-0.0086 ** (0.0035)	-0.0083 ** (0.0034)
<i>Male child indicator variable</i>		0.0006 (0.0054)					
<i>Number of male children</i>			-0.0045 ** (0.0022)				
<i>Ratio male to total children</i>				-0.0116 ** (0.0053)			
<i>Ln assets</i>					-0.0040 *** (0.0010)	-0.0027 *** (0.0010)	-0.0029 *** (0.0010)
<i>Firm age</i>						-0.0000 (0.0001)	0.0000 (0.0001)
<i>Industry-adjusted OROA, t=1</i>						-0.3737 *** (0.0163)	
<i>Industry-and performance-adjusted OROA, t=1</i>							-0.4219 *** (0.0311)
Year controls	No	No	No	No	Yes	Yes	Yes
Number of CEO transitions	4,692	4,692	4,692	4,692	4,692	4,692	4,692

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

TABLE VII. FIRM PERFORMANCE AND FAMILY SUCCESSIONS: OLS AND INSTRUMENTAL VARIABLES

The dependent variable is the change in firm profitability around CEO successions. In Columns I to VII firm profitability is defined as industry adjusted OROA. Industry adjustment is based on four-digit NACE (European industry classification system) benchmarks. In Column VIII firm profitability is defined as industry and performance adjusted OROA. Industry and performance adjustment uses as control group firms in the same decile grouping of industry adjusted OROA the year prior to succession. 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. Family CEO, the instrumented variable, is an indicator variable equal to one when the entering CEO is related by blood or marriage to the departing CEO, zero otherwise. Depending on the specification as indicated below, the instrumental variables are: the gender of the first-born child of a departing CEO (1=male, 0=female), the male child indicator variable (1=departing CEO has at least one son at the time of succession, 0=otherwise), the number of male children of the departing CEO, and the ratio of male to total number of children of the departing CEO. Control variables are as follows. *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. 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. Estimated coefficients in Columns I and II are from least square regressions. Estimated coefficients in Columns III through VIII are from a two-stage least square regression.

Dependent Variable: differences in operating profitability around CEO Successions (three-year average post succession) - (three-year average pre-transition)								
	OLS		IV-2SLS					
	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)
Family CEO	-0.0142 *** (0.0038)	-0.0079 ** (0.0036)	-0.1260 *** (0.0429)	-0.0722 ** (0.0317)	-0.0606 ** (0.0298)	-0.0808 ** (0.0383)	-0.0928 ** (0.0393)	-0.0886 ** (0.0384)
<i>Ln assets</i>		-0.0030 *** (0.0010)					-0.0074 *** (0.0023)	-0.0074 *** (0.0022)
<i>Firm age</i>		0.0000 (0.0001)					0.0001 (0.0001)	0.0002 (0.0001)
<i>Industry-adjusted OROA, t=-1</i>		-0.3727 *** (0.0164)					-0.3510 *** (0.0198)	
<i>Industry-and performance-adjused OROA, t=-1</i>								-0.3920 *** (0.0350)
Year controls	No	No	No	No	Yes	Yes	Yes	Yes
Number of CEO transitions	4,692	4,692	4,692	4,692	4,692	4,692	4,692	4,692
<u>Instrumental variables</u>								
Gender of the first child			√	√			√	√
Male child indicator variable				√				
Number of male children					√			
Ratio male to total children						√		

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

TABLE VIII. ALTERNATIVE WINDOWS OF ANALYSIS AND SUB-SAMPLES BASED ON INDIVIDUAL CHARACTERISTICS

All results are from a two-stage least square regression. Family CEO, the instrumented variable, 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 in Column I-V and in Column VII is the gender of the first-born child of the departing CEO (1=male, 0=female). The instrumental variable in Column VI is death of the departing CEO at succession (1=outgoing CEO dies in the year of the succession, 0=otherwise). The dependent variable is the difference in firm profitability around CEO transitions. Firm profitability is defined as industry and performance adjusted OROA. Industry and performance adjustment uses as control group firms in the same decile grouping of industry adjusted OROA the year prior to succession. *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 successions in Columns 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 was between 55 and 70 years of age at the time of transition. Column V reports results for firms where the departing CEO's age was either below 55 or above 70 at the time of transition. Column VI shows results for the full sample. Finally, Column VII uses 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 the time of succession; Firm age, 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 and performance adjusted OROA the year prior to succession. 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.

	Dependent variable: Differences in industry-and performance-adjusted operating profitability (three-year average post succession) - (three-year average pre-transition)						
	Windows			Sub-samples			
	Pre-transition differences in performance	Differences in performance around CEO transitions	Post-transition differences in performance	Departing CEO's age (55,70)	Departing CEO's age other than (55,70)	Full sample	CEO transition and departing CEO death occur in the same year
(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	
Family CEO	0.0325 (0.0420)	-0.0886 ** (0.0384)	-0.0435 (0.0608)	-0.0836 ** (0.0382)	-0.0962 (0.0926)	-0.0372 *** (0.0141)	-0.1475 (0.1411)
Year controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of CEO transitions	2,480	4,692	1,511	2,159	2,533	5,334	447
<u>Instrumental variables</u>							
Gender of the first child	√	√	√	√	√		√
Death of CEO around transition						√	

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

TABLE IX. OTHER SUB-SAMPLES BASED ON FIRM AND INDUSTRY CHARACTERISTICS

All results are from a two-stage least square regression. Family CEO, the instrumented variable, 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 transitions. Firm profitability is defined as industry and performance adjusted OROA. Industry and performance adjustment uses as control group firms in the same decile grouping of industry adjusted OROA the year prior to succession. Changes in profitability are computed as the difference between the average three-year post-succession profitability minus the three-year average before transition. Column I presents results for firms that had book value of assets above the median at the time of succession. Column II present results for firms that have a formal board of directors. Column III present results for firms in which there was at least one family member of the departing CEO after succession. Column IV present results for firms in industries that are above the median in terms of prevalence of family CEO transitions. Finally, Column V present results for firms in industries that are above the median in terms of production growth. All specifications include the following controls (estimated coefficients are not reported): \ln assets, the natural log of the book value of assets at the time of succession; Firm age, 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 and performance adjusted OROA the year prior to succession. 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. Robust standard errors are in parentheses.

Dependent variable:					
Differences in industry-and performance-adjusted operating profitability					
(three-year average post succession) - (three-year average pre-transition)					
	Firms with assets ≥ median	Firms with formal board of directors	Firms with family members in board post- succession	Firms in industries with share of family ≥ median	Firms with industry growth ≥ median
	(I)	(II)	(III)	(IV)	(V)
Family CEO	-0.1140 ** (0.0478)	-0.0934 ** (0.0470)	-0.0901 * (0.0518)	-0.0507 (0.0406)	-0.1661 ** (0.0775)
Year controls	Yes	Yes	Yes	Yes	Yes
Firm controls	Yes	Yes	Yes	Yes	Yes
Number of CEO transitions	2,397	3,239	1,533	2,022	1,924

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