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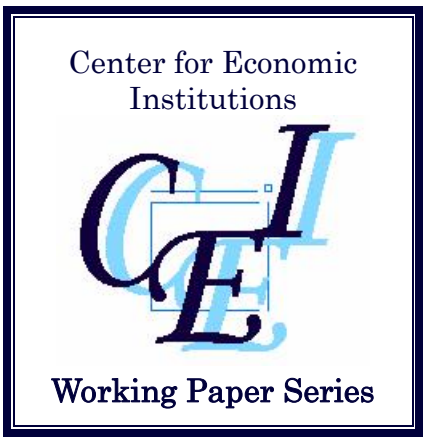

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Abstract. Estimating the value of top managerial talent is a central topic of research that has attracted widespread attention from academics and practitioners. Yet, studying the impact of managers on firm performance is difficult because of endogeneity and omitted variables concerns. In this paper, we test for the impact of managers on firm performance in two ways. First, we examine whether top executive deaths have an impact on firm performance, focusing on the manager and firm characteristics that are associated to large manager-death effects. Second, we test for the interaction between the personal and professional activities of managers by examining the effect of deaths of immediate family members (spouses, parents, children, etc) on firm performance. Our main findings are three. First, CEO deaths are strongly correlated with declines in firms operating profitability, asset growth and sales growth. Second, the death of board members does not seem to affect firm prospects, indicating that not all senior managers are equally important for firms' outcomes. Third, CEOs' immediate family deaths are significantly negatively correlated to firm performance. This last result suggests a strong link between the personal and business roles that top management plays, a connection that is present even in large firms. Overall, our findings demonstrate CEOs are extremely important for firms' prospects.

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What do managers *do*? Do managers *meaningfully* affect firm decision' making and performance? What types of managers (decisions) do matter? What types of shocks affect managers' productive abilities? Estimating the source and value of top managerial talent is a central topic of research in corporate governance. Yet empirical studies testing for the value of managers on performance have typically faced the challenge of finding a suitable counterfactual to convincingly assess the contribution of managers in their organizations. This challenge arises from the fact that firms do not randomly appoint nor fire managers. Thus it is hard to evaluate firms' performance in the absence of the current, presumably efficient, managers.

Empirical studies typically infer the value of managers on their firms from either purely cross-sectional settings or from manager turnover events. The former type of studies commonly face the challenge of distinguishing managerial effects from other firm attributes, as it is hard to find suitable controls for all relevant firm and managerial characteristics. The latter empirical strategies, in contrast, tend to be better at distinguishing managerial from firm-invariant characteristics as they commonly infer managerial value from differences in firm performance around turnover events. Yet, executive turnovers tend to occur only under dramatic circumstances resulting from both managers' actions (discretion) and changing firm characteristics, which are difficult to disentangle.

In this paper we seek to overcome some of the shortcomings of pre-existing work in the literature by evaluating the impact of managers on performance using variation from managers' own deaths and other personal shocks. Specifically we test whether the death of the manager or the death of a family member (spouse, parents, children, etc) affects firm performance. The advantages of this horrid empirical strategy are two. First, we can identify a shock that presumably affects managers' ability to perform their jobs: directly through their own death or indirectly as a result of personal grief, which might affect the effectiveness of managers to execute their professional roles. Second, it is reasonable to expect that beyond its effect on managers, personal shocks, particularly those associated to family members that are unaffiliated to the managers' firm, do not affect firms' investment opportunities through other channels.

Our analysis on the death of top executive officers resembles the empirical strategy of Johnson, Magee, Nagarajan, and Newman (1985), who assessed the impact of sudden deaths of senior corporate executives on the stock prices of 53 U.S. publicly-traded firms. We extend the analysis to the performance evaluation of a larger number and wider range of firms. Further, we also assess the impact of a richer array of executive and firm characteristics that could affect the impact of managers on firm performance.

More interestingly, our focus on the shocks occurring to the immediate family members of managers, and our assessment of their potential consequences on firms' outcomes provides a new test for the interaction between the personal and the business roles that managers play. This latter test allows us to (1) investigate the level of overlap between these two spheres under management influence, and (2) identify the differential impact of alternative shocks occurring to business executives.

To pursue these questions empirically, we use a unique dataset that matches (1) every limited liability firm in Denmark to its chief executive officer (CEO) and to its members of the board of directors, and (2) every executive and director in the sample to Civil Registry data containing information on the managers' family tree. Using Civil Registry information we are able to identify CEO deaths, as well as, deaths occurring in the managers' immediate families. We then use the National Hospital Records of Denmark to identify the causes of each death.

We identify 11,002 deaths occurring to executives and board members, and their immediate family members between 1994 and 2002. In the sample, 1,476 deaths corresponded to CEOs (629 cases) and board members (847), 1,483 to spouses, 415 to children, 5,046 to parents, and 2,561 to parents-in-law, respectively.

We begin our analysis by testing for direct senior management (CEO and board members) effects. We find evidence that the death of top managers is likely to cause a statistically significantly and economically large decline in firm profitability. Operating returns on assets (OROA) falls by 0.6 percentage points using a two-year window around managerial deaths. This decline is equivalent to a 9.6 percent decline in profitability. Interestingly, the significant effect in performance is only explained by the deaths of CEOs, which are associated with a decline in OROA of 1.4 percentage points or 18 percent, significant at the one-percent level. The effect of board members in performance

is negative but insignificant at conventional levels. These results indicate that the loss of the current CEOs, but not of a board member, is important for firm's prospects.

We then assess the impact of family shocks on firm performance. We find that deaths of immediate family members of managers also cause significant declines in performance. OROA falls by 0.8 percent, 0.7 percent, 0.6 percent, and 0.4 percent when the deceased is a spouse, a child, a parent, and a parent in law, respectively. The declines associated with deaths of a spouse and of a parent are statistically significant at the one percent level. Paralleling the results obtained with own death shocks, we find that family members' deaths are associated with statistically significant declines in performance only when these shocks occur to CEOs (results are statistically significant at conventional levels for all types of family members), but not when they occur to board members.

Given that our dataset is representative of the universe of limited liability firms in Denmark, one concern with the above-described results is that they might only be relevant for small firms, which tend to be more dependant on their CEOs and where the level of overlap between personal and business affairs is likely to be larger. We find, however, that this is not the case. Both small and large firms' operating profitability is significantly hurt by shocks affecting their CEOs.

We test further whether our family death shocks are likely to reflect "direct" or "indirect" shocks. One concern with the family shock results is that the deaths of family members might affect firm performance directly because the deceased relative was a key firm employee. Our results, however, indicate that this is not the case. Deaths of family members that are not of working age (younger than 18) have a large and significant negative effect on firm profitability that is statistically indistinguishable from the declines in performance that result from the deaths of other family members. This finding highlights that the family-death results are driven by an indirect shock that works through the firms' CEO.

We provide suggestive evidence that the decline in performance around direct and indirect shocks is related to managerial ability. Specifically, we find that the decline in performance following a shock to a CEO is larger in industries in which managerial talent is presumably more important, such as, fast growing industries, as well as, in environments with highly educated labor force.

Overall, manager-death shocks provide direct evidence that CEOs (but not board members) are extremely important for firm performance. Family-death results demonstrate there is a strong overlap between the personal lives and the professional roles that CEOs play, and they provide further evidence that current CEOs are extremely important for firms' prospects.

While we cannot provide a direct test for whether our results reveal that CEOs add economic value in an ex-ante sense, we do show that the CEOs' permanent or temporary absence is material for firm performance, ex-post.

The rest of the paper is organized as follows. Section I reviews previous work in the literature that is closely related to our own analysis. Section II describes the data and presents summary statistics. Section III outlines our empirical strategy; Section IV presents the results of the paper; and Section V concludes.

I. Related Literature [incomplete]

Our work is related to several lines of research as detailed below.

First, there is a large literature that also studies managerial departures but as a result of forced resignations and retirements rather than death. Denis and Denis (1995) evaluate changes in operating return on assets around such events in a sample of 908 U.S. publicly traded firms and find significant performance improvements after the event, especially for forced resignations. Huson, Malatesta, and Parrino (2004) also find improvements in accounting profitability after CEO turnover events. Moreover, they find that the stock price reaction to the turnover event is positively correlated with the subsequent improvement in accounting measures.

In this paper we focus instead on managerial departures that are due to death. Resignations and retirements can be prompted by changes in unobserved firm characteristics, making it challenging to disentangle the effect of the loss of the current manager from the change in firm circumstances. The advantage of focusing on death related departures is that the timing of death is exogenous to changes in unobservable characteristics of the firm. As a result the measured change in firm performance can be attributed to the loss of the deceased manager.

Our empirical strategy is closely related to that of Johnson et al. (1985) who asses the stock price reaction of sudden executives deaths on 53 U.S. publicly-traded firms. We extend the analysis to the performance evaluation of a larger number and wider range of firms. Further, we also assess the impact of a richer array of executive and firm characteristics that could affect the impact of managers on firm performance.

Second, our results on the relation between the personal life and the professional role that managers play are related to a growing literature on manager characteristics and firm decision-making. Bertrand and Schoar (2003) show that variation in firm policies can be attributed to manager fixed effects suggesting a role for managerial preferences, opinion, experience, etc. in firm decision-making. Perez-Gonzalez (2006) studies the performance consequences of nominating either a family CEO or a one that is unrelated to the departing executive. He finds that the level of education of a family CEO is associated with performance, with more educated family CEOs performing better. Bennedsen, Nielsen, Perez-Gonzalez and Wolfenzon (2007) study the effect of family characteristics on the decision to name a family or an unrelated successor and ultimately on performance. They show that family characteristics have a strong impact on this decision. For example, they find that CEOs whose firstborn are males are more likely to pass on control to a family member than those with female firstborns. They also show that other family characteristics, such as number of children, CEO marital status, etc., are associated with the succession decision.

II. Data Description and Summary Statistics

II.A. Data Sources

We construct a dataset starting from the universe of limited liability (publicly and privately held) firms in Denmark (74,880 firms) and identify 11,002 firms in which the CEO, a board member, or any of these managers' immediate relatives die between 1994 and 2002. Our dataset contains financial information on firms, as well as personal and family information about CEOs and board members. The dataset was constructed based on four 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 on 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. The disclosure of alternative firm-level attributes, such as sales or employment, is not required, although some firms do selectively report them. Management data, which all firms are required to report, include 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. 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 CEOs and board members are from the official Danish Civil Registration System. These administrative records include the personal identification number (CPR), 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 and board members' family trees and to identify deaths in their families.

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.

Firm by firm, we match the name of the CEO reported in KOB with the name reported in the ES dataset. For all these matches, we use the CPR number from ES to obtain family information from the official Danish Civil Registration System. 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.

4. Finally, we use the National Hospital Records of Denmark to obtain information about the causes of death as well as the number of days the deceased stayed at the hospital prior to dying.

In the paper, we classify a firm as an event firm when three conditions are met. First, the records in the CRP agency indicate that the CEO (board members) or any of his (their) immediate relatives die during the managers' tenure. Second, we require that matching financial information from KOB is available around CEO transitions and that firm employment, where available, was not zero. Third, in case of multiple shocks to a single firm, we retain only the first one.

II.B. Firm Characteristics

Table I presents summary statistics of the firms in the sample both as a group (Column I) and classified by their event status. Information for *non-event firms* is listed in Column II and that for *event firms* is in Column III.

Table I shows that event firms are larger than non-event firms. The first row in Table I shows the natural logarithm of total assets for the firms in the sample. Event firms are relatively larger. On average, event-firms had 2000 Danish Kroner (DKR) 67.2 million or US$8.3 million in assets. In contrast, non-event firms had, on average, DKR 27.2 million or US$3.4 million in assets.[1] The difference in firm size is significant at the one-percent level. As an alternative measure of size, we report the natural logarithm of

[1] The average exchange rate in 2000 was equivalent to 8.08 Kroner per U.S. dollar (*World Development Indicators*).

sales in the fourth row. The figure for event firms is larger than that for non-event firms and the difference is significant at the one-percent level.

Table I also shows that event firms are older. On average, firm age is almost 17 years for event firms, while it is only 10 years for non-event firms. Again, this difference is statistically significant at the one-percent level.

There are two reasons why event firms are larger and older. First, larger and older firms are more likely to have a board of directors and, conditional on having one, they are more likely to have larger boards. These firms are more likely to have a shock because the pool of potential candidates who can die is larger. Second, in the data there is a positive correlation between firm age and the age of its managers. Older manager are more likely to have larger families and also more likely to have older family members, increasing the probability of having a death in the family.

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. Operating return on assets (OROA) is measured as the ratio of earnings before interest and taxes (EBIT) to the book value of assets. OROA is a natural measure of performance that has been previously used in the CEO turnover literature to assess if firms operations change around successions [Denis and Denis, 1995; Huson, Malatesta, and Parrino, 2004; Pérez-González, 2006; Bennedsen Nielsen, Pérez-González, and Wolfenzon, 2007]. It compares a comprehensive proxy of firms' cash flows (EBIT) to the total asset base used to generate them. Unlike net income-based measures, such as return on assets, it is unaffected by differences in the firms' capital structure decisions. In contrast to return on equity or return on capital employed, it compares firm performance relative to total assets, rather than to a fraction of them. Average OROA is 6.0 percent for all firms in the sample.

Splitting firms by event status, we find that event firms are, on average, more profitable than non-event firms: 7.7 and 5.7 percent, respectively; the difference of 2.0 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 3.4

percent and, as before, event firms are more profitable than non-event firms. The difference is 0.9 percent, significant at the one-percent level.

Table I also reports industry-adjusted measures of OROA. Industry controls are calculated using equally weighted averages of all active firms. For each industry, 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-digits if the 20-firm restriction is not satisfied with four- or three-digit groupings. Industry-adjusted OROA shows that the difference in profitability for event and non-event firms is not entirely driven by industry characteristics: the difference is 1.1 percentage points. The reason why event firms are more profitable could be that better firms survive longer. This longevity implies that managers in these firms are older and hence, as explained before, more likely to suffer a death in the family of the CEO or one of its board members.

Finally, Table I shows that event firms have higher asset and sales growth. For both these measures the differences between event and non-event firms are significant at the one-percent level.

In sum, Table I shows that event firms are older, larger and more profitable than non-event firms.

II.C. Event characteristics

We classify shocks by the type of manager affected: CEOs (5,597 shocks) and board members (5,405 shocks). Given that boards of directors typically have many members, it might appear that the number of shocks to board members is too low relative to that for CEOs. There are two reasons, however, why this is not the case. First, many firms in Denmark have more than one CEO. Second, in Denmark, limited liability firms incorporated as ApS corporations can choose whether to have a board of directors and many choose this option (38 percent of our sample).

We also classify shocks by the type of relation between the manager and the deceased. We identify 1,476 shocks to managers themselves, 1,483 to their spouses, 415 to their children, 5,067 to their parents, and 2,561 to their parents-in-law. In our sample

84% of the managers are male, which are more likely to die before their female spouses.[2] Despite this fact, the number of shocks to managers is roughly the same as the number of shocks to spouses. This can be explained by the fact that we construct the sample by taking the first shock for each firm. This procedure, in effect, over samples male relative to female family members. The small number of child relative to managers' deaths is due to their young age. Age can also be a factor that explains the large number of shocks to parents.

III. Empirical Strategy and Prediction

We use shocks to CEOs, board members and these managers' family members to answer a number of questions related to the role of managers in their organizations.

First, we test whether managers materially affect their firms' prospects by evaluating the change in performance around their *own* death. This test measures the effect of the loss of the senior manager. If the manager's absence is not important for her firm's prospects, we should not observe any significant change in performance around the event. In contrast, if the manager's presence is important, we should observe a significant change (positive or negative) in firm performance around her death.

An alternative setting to study the effect of the absence of a manager is to evaluate changes in firm performance around resignations and firings. However, a problem with this strategy is that resignations and firings might be prompted by changes in unobservable firm characteristics whose effect we might erroneously attribute to the manager's absence. For example, a statistically insignificant change in performance following a forced management turnover can be view as evidence that the new and old CEOs are of comparable ability. However, an alternative explanation is that, expecting investment opportunities to deteriorate, the board chose a higher ability manager. The effect of better management outweighed the more difficult circumstances the firm faced, resulting in virtually unchanged performance. Because the timing of deaths is likely to be

[2] Even though same-sex marriage is allowed in Denmark since 1989, only a small fraction of the CEOs in our sample have a spouse of the same sex.

exogenous relative to observed and unobserved firm characteristics, our empirical strategy does not have this problem.

Second, we analyze whether deaths of managers' immediate relatives affect performance through their effect on the manager. We first evaluate whether deaths of managers' family members have an impact on firm performance. Finding a significant change in performance, however, does not necessarily imply that the shock works through the manager. An alternative interpretation is that the deceased worked in the firm and his death implied the loss of a key employee. Even though we do not have complete information on all employees of firms, we can test this alternative hypothesis by assessing whether the effect is present for family members that are not of working age. If the change in performance is still significant for this group, it would suggest that the family member's death impacts performance indirectly through its effect on the manager.

Even if we are able to rule out the direct effect of the death of a manger's family member on firm performance in favor of an indirect effect working through the manager, we would still not be able to attribute differences in performance changes around the event to managerial ability. The reason is that the effect on performance we measure is driven by at least two factors: managerial ability and her response to the shock (e.g., in terms of reduced effort supplied or fewer hours worked). To illustrate this problem, assume that performance, P, is given by the product of managerial ability, a, and effort supplied, e, as follows:

$$P = a * e.$$

The change in performance around a family members' death is given by:

$$\Delta P = a * e_s - a * e_n = a \, \Delta e,$$

where e_n is the effort supplied under normal circumstances and e_s is the effort supplied following the shock. Under the assumption that the behavioral response to the shock is constant for everyone (constant Δe), we could use the measured ΔP to rank managerial ability: the higher the magnitude of the performance change, the higher managerial ability.

However, if the behavioral response is not a constant across managers differences in ΔP across firm will capture variation in abilities and the response to the shock. Moreover, the interpretation of ΔP becomes problematic is ability and the behavioral response to the shock are correlated. For example, consider the extreme case in which high-ability individuals (high a) are also the ones who are not distracted from their professional activities even under extreme personal circumstances ($\Delta e=0$). In this case the magnitude of ΔP for high-ability managers would be zero and that for lower ability managers would be strictly positive.

To investigate cross-sectional variation in ability and the behavioral response to the shock, we compare the effect of managers' own shocks to that of shocks to managers' family members as a function of individual, firm or industry characteristics. This strategy is valid if the firms affected by managers' deaths are comparable to those affected by deaths of managers' family members.

As an illustration, suppose that we seek to evaluate the effect of managers' education. We first compute the change in performance around managers' own deaths separately for two groups of managers split by their education level. Suppose that we find that the change in performance is not affected by manager's education. Because managers' own deaths are not confounded with a behavioral response, one interpretation of this result is that managerial ability is not related to education level. We then compare the change in performance for the two groups of managers when the shock is defined as deaths of the managers' family members. Suppose we find that performance drops more when relatives of highly educated managers suffer the family shocks. Because results from own shocks suggest that ability of these two groups if the same, a larger magnitude in the highly educated group would suggest that these managers have a larger behavioral response.

Finally, to gain further understanding of the results, we study the cross-sectional distribution of the effect using individual, firm and industry characteristics. For example, a significant drop in performance around a managers' death could be due to the fact that the deceased manager was particularly adept at managing the firm. If this were the case, we would expect a larger drop in performance in firms in which managerial ability is likely to be more important. The same negative drop could be alternatively explained by

a lengthy succession process during which there is a power vacuum. If this were the case, we would expect to find a larger drop in performance in firms that had less time to prepare for the shock, that is, firms in which the death was sudden and unexpected.

IV. Results

IV.A. Univariate analysis

We initially test for the impact of top management own and relatives' deaths on firm performance by computing mean differences in industry adjusted operating profitability around these events. These differences are computed using the average operating profitability in the year of the death and the year after, and subtracting the average profitability of the same firm the two years prior to the death.

Table II shows that the 11,002 deaths in the sample are associated with an average decline in profitability of 0.63 percentage points. The decline is significant at the one-percent level. When we divide the deaths in the sample into two groups depending on whether they occur to CEOs or to board members, we find that it is only those deaths associated to the CEO directly or to his or her relatives that matter for firm profitability. Deaths occurring in the family or to the CEO are linked to a reduction in OROA of one percentage points, significant at the one-percent level. This decline in OROA is equivalent to 13 percent decline in profitability in two years. Board member shocks in contrast, do not exhibit a significant role on firm profitability. Average profitability falls by 0.25 percentage points, yet this decline in OROA is not statistically different from zero at conventional levels. The difference in the decline in performance between CEO and board member shocks is -0.747. It is, however, not statistically different from zero.

The differential results for CEO and board members found in Table II could be graphically seen in Figure 1. Figure 1 plots average industry-adjusted OROA relative to the year prior to the deaths identified in the sample, which is set to zero. In contrast to Table II that only focuses on years *t=-2, t=-1, t=0 and t=+1*, Figure 1 reports average industry adjusted OROA for the years ranging from *t=-4 to t=+4*, where the data is available. Figure 1 shows there is no significant movement in firm profitability before the benchmark year. Yet after the shocks occur, firm profitability falls particularly for those

firms that receive a CEO shock. Figure 1, also suggests the estimated effects would be larger than the first row in Table II suggests, if we were to open the window of analysis to include years *t=+2 and t=+3*.

The second row in Table II presents mean declines in performance for the cases of direct-manager deaths only. Consistent with the idea that senior management deaths harm firm profitability, we find that on average the 1,476 CEO and board members deaths identified in the sample are associated to a decline in profitability of 0.744 percentage points. Broken by managerial roles, we find that CEO own deaths are correlated with a 1.44 percentage points decline in profitability, significant at the one-percent level. On the other hand, board members' own deaths are associated to an insignificant 0.22 decline in OROA. The difference between CEO and board members deaths is 1.22 percentage points, significant at the 10-percent level. These mean differences suggest CEO shocks are arguably more important for firms' prospects than shocks occurring to members of the board.

Table II also presents mean differences in industry adjusted OROA for the case of spouse, children, parent and parent-in-law deaths. The effect of family deaths on firm profitability resembles the direct manager death effects. Namely, the point estimate of CEO shocks on performance is statistically different from zero for every event: spouses (one-percent level), children and parents (five-percent level), and parents-in-law (ten-percent level) deaths. The estimated coefficient ranges from -1.63 for children' to -0.67 for parents-in-law. Interestingly, the largest average declines in profitability are found in the personal shocks that affect the CEOs own nuclear family, that is, in the deaths of their spouses and children. In contrast, no board member shock is, on average, statistically different from zero at conventional levels. The resulting CEO-board member differences are generally no different from zero, yet they suggest CEO shocks tend to hurt firm performance more than shocks occurring to board members.

One concern with the shocks identified above is that they might only be representative of small firms. Our dataset builds on the universe of firms in Denmark, where a significant fraction of firms is indeed small. To explore whether size alone could explain why we identify a relationship between managerial shocks and firm profitability, in Table III we divide the sample firms into five groups according to size (total assets).

Given the results in Table II, in Table III we concentrate on the effect of CEO shocks only. For reference, we replicate in the first row of Table III the estimated coefficient for CEO events and we also report the estimated effects broken by direct and family events.

Table III shows CEO shocks affect firms irrespective of which size quintile they belong to demonstrating a strong overlap between CEO's personal and business spheres. The largest quintile of firms indicates that CEO shocks lead to a decline in OROA of 0.99 percentage points, significant at the one-percent level. The estimated effect of CEO shocks are -1.079, -1.218, -0.866 and -0.853 for quintiles one through four. All of these shocks are significant at the five-percent level except for the shock on the smallest quintile, which is significant at the 10-percent level. Interestingly, the difference between quintile five and one is small (0.087) and not statistically different from zero. The last column in Table III tests for the difference between CEO death effects and those derived from the death of family members for each size quintile. We fail to find significant differences for direct and indirect shocks.

Table IV explores whether the direct and indirect shocks described above differ systematically as a function of the gender of the manager (Panel A) or the deceased (Panel B). As in Table III we only report shocks occurring to CEOs. Columns II and III report results for females and males, respectively. The first row in Table IV shows direct shocks only. We find that, on average, the 41 female-CEO deaths in the sample lead to a decline in operating profitability of 0.43 percentage points. Yet this decline is not significant at conventional levels. Male-CEO deaths (588 cases) are found to induce a decline in OROA of 1.51 percentage points, significant at the one-percent level. The difference across gender is not statistically different from zero. The fact that female CEOs are not found to induce a larger decline in firm profitability is not in line with the notion that those female CEOs that make it to the top managerial position are superior in terms of ability relative to those male CEOs that do not have to suffer discrimination.

The second row in Table IV shows the average family shock effects for female and male CEOs. Firms whose female CEO suffers a death in the family undergo a decline in industry adjusted OROA by 2.23 percentage points, a decline of 28 percent relative to average profitability. In contrast, firms whose male-CEO suffers a family shock exhibit a decline in profitability by 0.80 percentage points (8 percent points). The difference for

female and male family shocks is 1.43 lower for males, significant at the five-percent level.

As discussed in Section III, the larger effect on female-CEO firms could be attributed to several firm or CEO characteristics, such as higher ability of female CEOs, differential emergency planning, or higher female commitment to family-related activities relative to males, among others. If, however, those firms that suffer direct and indirect shocks have comparable investment opportunities, organizational designs, family participation and CEO talent, the significant gap between female and male CEOs could potentially be attributed to a differential gender response to these family shocks. Alternatively, these differences could, for example, reflect the fact that female CEO shocks differ because a spouse shock also implies the loss of a key employee (the spouse). This "double" shock would be arguably less likely to occur in a male-CEO firm if female-spouses are less likely to work in the same firms as male-spouses.

When we analyze family shocks in detail, we find that female-CEO firms exhibit the largest effects on profitability in the case of spouses and children (-4.1 and 3.8 percentage points, significant at the one and ten percent levels, respectively), then parents (-2.4, significant at the five-percent level) and the lowest in the case of parents-in-law (an insignificant 0.428). The effects in male-CEO firms are less robust statistically: only those with over one thousand observations are significant, that is, the shocks for parent and parents-in-law, both with estimated effects of close to 0.8 percentage points.

In Panel B in Table IV, we test for differences in the estimated effects as a function of the gender of the deceased. We find large and statistically significant differences for spouses and parents-in-law. Specifically, the death of a male spouse is found to hurt firm performance by 3 percentage points more relative to the female-spouse effect. Similarly, the death of a father-in-law is found to hurt firm profitability by 2.6 percentage points more than the death of a mother-in-law. Surprisingly, mother-in-law deaths are the only family-shock event with a non-negative (although insignificant) estimated coefficient.

One concern with the family-shock results in the preceding tables is that they might be explained by the death of a family member that is also employed in the same firm. Given that we could not identify who works for each specific firm, we can

alternatively test if those family members that die but that are unlikely to work in the firm also induce significant performance shocks. In Table 5 Panel A, we investigate the impact of children deaths as a function of their age. Interestingly, industry-adjusted OROA in those firms whose CEO's children die at an age younger than 18 years (65 observations) falls by 3.2 percentage points, significant at the one-percent level. Conversely, the decline in OROA for older than 18 years of age children is one-percentage points but it is not significantly different from zero. This result shows that it is unlikely that family shocks affect firm profitability because they hurt the labor force output of a family member that works in the same firm.

Sorting by the number of children we find the biggest effects on firm profitability in cases where the CEO only has one child. Specifically, one-child death shocks correlate with a 5 percentage point decline in firm profitability irrespective of the age of the child. The difference with respect to three or more children-CEO firms is -4.9, significant at the one-percent level. The lack of difference in the one-child cases for those younger than 18 and those 18 or older again cast doubt on the idea that family shocks are only driven by children who participate directly in the firms activities.

In Table 5, Panel B, we provide an alternative test for the idea that family members hurt firm performance through their direct involvement in firms by investigating the differential effect of relative who die at an age of 75 years or older. Older relatives are presumably less likely to be directly involved in productive activities and if they are, it could be argued that the value of their productive output is potentially less valuable than the value of younger relatives. We find a significant decline in firm profitability of 0.90 in those firms whose CEO's relatives die at age 75 or older, almost identical to the lower 0.92 found for younger relatives. The evidence does not support the idea that family shocks are larger for those relatives of active working age.

Overall, univariate tests highlight four main results. First, CEO deaths affect firm profitability and show CEOs are material for firms' prospects. Second, board member deaths do not seem to significantly affect firm performance. Third, the death of CEO family members including those who are not of active working age demonstrates a strong connection between the personal and business roles top CEOs play. Fourth, there is a

differential family-shock effect in female- relative to male-CEO firms, which is not straightforward to disentangle.

IV.B. Regression analysis

Death associated shocks and firm profitability, asset and sales growth

We now test for the impact of family and own deaths on firm performance controlling for an array of observable firm characteristics. In Table VI we test for the impact of these shocks on firm profitability, investment (asset growth) and sales growth using as controls firm size (natural logarithm of total assets), firm age, firm time-invariant characteristics (firm fixed effects) and aggregate time effects. As control group we initially use all non-event firms with available data. In all cases, we report clustered (firm) robust standard errors in order to adjust for the large number of firm-level observations and the potential problem arising from the fact that these observations might not be independent from each other (Bertrand, Duflo and Mullainaithan (2004)).

In Table VI Column I, we assess if these shocks affect firm operating profitability by comparing firm industry-adjusted OROA before and after the identified deaths using a two-year window. Notice that beyond the above-described controls, these specifications capture the effects net of average industry-year averages. We find that on average CEO and board shocks induce a decline in OROA of 0.32 percentage points, significant at the five percent level. The size and age controls suggest larger firms tend to be more profitable while older companies are likely to be less profitable than other firms.

Column II in Table VI shows the impact of death shocks is economically large and statistically significant only for those firms where the shock affects the CEO. Board shocks do not significantly affect profitability levels. Further, the point estimate of the effect of board shocks on OROA is positive, yet indistinguishable statistically from zero. In contrast, CEO shocks reduce firm operating profitability by 0.77 percentage points, significant at the one-percent level. Column III shows these effects are driven by CEO shocks.

Table VI also shows the estimated effect of these shocks tends to fall as we expand the window of analysis to four years around events (Column IV) or when we estimate the difference in OROA using information from the years *t=-4*, *t=-3* and *t=+3*, *t=+4* for the event firms. Yet, event in this latter case, we find that own and family shocks to CEOs are found to harm performance by 0.63 and 0.54 percentage points, respectively.

In Table VI Column VI we evaluate the impact of CEO-shocks on investment decisions measured by the change in total assets. CEO deaths could, for example, coincide with significant investments efforts by a new CEO which by construction would lead to a temporary reduction in operating profitability. We find that higher investments could not explain why OROA falls. On the contrary, asset growth falls significantly after these CEO shocks occur. The estimated coefficient indicates shock firms asset growth is 0.9 percentage points lower in the two year-window around these events. This average decline is equivalent to a 20 percent decline in asset growth relative to mean investment levels. In other words, own and family shocks reduce operating profitability even when the firms affected by the shocks exhibit lower asset accumulation relative to their recent past and other firms in the economy.

Lower profitability on assets and lower asset growth suggest a larger than proportional impact of family shocks on cash flow measures. To test this idea empirically, we evaluate the impact of CEO shocks on sales growth for those firms in the sample with available data around these events. Table VI, Column VII presents the findings. Sales growth is 2.2 percentage points lower for event-firms in the post period relative to other comparable firms. This decline is significant at the one-percent level. Sales growth declines do confirm that CEO shocks hurt cash flow measures more than OROA numbers suggest.

Family and direct shocks, gender differences and younger relatives

Table VII Columns I and II, replicates the analysis shown in the initial columns in Table VI using industry-adjusted OROA when we focus exclusively on events firms. We find that, on average, all CEO and board member shocks do not significantly affect

OROA. The estimated effect is -0.2, but it is not different from zero at conventional levels. Interestingly, and consistent with previous analyses, Table VII Column II demonstrates CEO shocks induce large declines in profitability. The impact of CEO shocks on industry-adjusted OROA is -0.80, significant at the one-percent level. The impact of board shocks is again insignificant.

Table VII, Column III tests for differences in own and family shocks as a function of who these shocks occur to. We find that CEO shocks both direct and through the family significantly affect firm profitability. The average CEO-shock coefficient is -0.79, significant at the one-percent. Conversely, the direct manager effect and the CEO-direct manager effects are no different from zero at conventional levels. These results indicate that the source of the shock seems less important than the channel, namely, the CEO.

We now test for significant differences in manager effects as a function of the gender of the active manager. In Column IV of Table VII, we find shocks occurring to female-managers both CEO and board members are associated to a significantly larger shock to profitability by -0.64, significant at the 10-percent level. Column V shows the female-manager effect is not significant when we split it into CEO-female firms and firms with a female board member.

The last two columns in Table VII evaluate whether family members who are not linked to the firm are likely to generate a lower estimated effect on performance. Under the hypothesis that family shocks matter for firm performance only because they represent the death of a relative who directly contributes to firms' outcomes, we would expect family deaths of relatives who are not expected to participate in the firm to generate a lower impact on firm profitability relative to those relatives who are of active working age. Alternatively, if family shocks affect firm performance because the CEO is less able to perform her or his responsibilities in the presence of a family shock due to a reduction in the effective time allocated to productive (non-family) tasks, we should find no difference. Column VI shows that shocks arising from the death of children younger than 18 years of age do not induce a significantly lower profitability relative to other shocks. Interestingly, when we interact the CEO with the young children shock terms (Column VII), we find that this term is linked, if anything, to higher –not lower– declines

in OROA. As a result, Columns VI and VII suggest the CEO-family shock effects are indirect: they affect firm performance through the CEO.

Unexpected shocks, top management structure and industry characteristics

In Table VIII, Columns I and II we examine whether those deaths that are more likely to be classified as unexpected induce larger or smaller effects on firm profitability relative to other deaths. In Column I we only report those firms where the deceased was found to have died from a condition where the one-year probability of survival conditional on an initial diagnosis is less than 25 percent. As before, we find that board members-shocks do not significantly affect firm profitability in any sub-sample in Table VIII.

Looking at CEO shocks we find that those deaths that are more likely to be unexpected are associated to large declines in operating profitability of 2.1 percentage points, significant at the one-percent level. In contrast, the point estimate found in Column II, which corresponds to those conditions with larger than 25 percent one-year survival probabilities, is -0.7, also significant at the five-percent level. The fact that unexpected shocks are more harmful to firm performance could be attributed to the fact that expected deaths allow both family and firms to prepare both emotionally and in organizational terms for the eventual shock. In the case of the direct CEO shocks, firms have more time to prepare for an orderly management transition. Similarly, expected family shocks are less likely to reduce the effective productive abilities of CEOs by providing time to plan both at the firm and at home for the eventual family shock.

Columns III and IV in Table VIII seek to directly test for the differential impact of CEO shocks under alternative organizational structures. In particular, Denmark provides with an interesting laboratory for analysis as the legal environment allows a range of small firms to use a dual CEO structure in lieu of a board of directors. While it is beyond the scope of this paper to evaluate whether such organizational structure is superior relative to other forms of organization, it is arguably reasonable to assume that dual CEO structures are better prepared to overcome a direct-CEO or a CEO-family shock relative to unique-CEO hierarchies. In Column III we report the estimated

coefficients for the sub-sample of firms with a single-CEO arrangement. We find a gap in industry adjusted OROA of -0.96, significant at the one-percent level. Interestingly, Column IV shows that the sub-sample of dual-CEO firms do not undergo statistically significant declines in operating profitability after they are subject to a CEO shock. The estimated CEO-shock effect is -0.47 but it is not statistically different from zero at conventional levels. These results do suggest that organizational planning and structures could potentially reduce the impact of CEO shocks on firm performance.

Table VIII also shows the results when we split the firms in the sample into two groups based on the growth patterns of the industries in which the relevant firms operate in. We split the industries in half based on total asset growth at the industry level during the sample period. Column V (VI) shows the results for those firms in industries with relatively slow (high) asset growth. We find that CEO-shocks are found to reduce operating OROA in the two sub-samples, leading to a decline in operating profitability of 0.67 and 0.91 percentage points in the slower and faster growth industries, respectively.

Finally in Table VIII we test for evidence that chief executive officers tend to be more important in relatively high skilled industries. Bennedsen, et al (2007) show the value of professional CEOs tends to be higher in those industries where a large fraction of the labor force is relatively well educated. Columns VII and VII present the results when we divide the firms in the sample into two groups based on the industry-level share of employees with a college or superior degree. Consistent with the idea that the firm effects derived from CEO-shocks are linked to CEO ability, we show that CEO shocks only hurt firm profitability in knowledge intensive industries. In contrast, CEO shocks are not statistically different from zero in industries with low labor force schooling levels.

V. Conclusions

In this paper we have investigated the impact of individual shocks occurring to senior management or to the relatives to senior management on firm performance. We have argued that analyzing these shocks is attractive because they provide a plausible exogenous source of variation to empirically assess the importance of managers in their

firms, as well as to quantify the interaction between the personal and business roles that managers play, and their bearing on firm performance.

To pursue these tests, we used a unique dataset that allow us to match every firm in Denmark to information about the firms' financials, its management team and to official Civil Registry data on its managers. Based on these data we were able to construct manager specific family trees and to identify cases of both managers' deaths and deaths of close managers' relatives, such as spouses, children, parents and parents-in-law.

We first used senior management deaths to evaluate whether firm profitability is affected when chief executive officers (CEOs) and board members die. We found that firms' prospects are significantly negatively affected by the loss of their CEO, but are unaffected by the loss of a member of the board. Our results, as a result, provide empirical support to the idea that certain managers, in our sample firms CEOs, are extremely important firms' performance: CEO deaths affect firms operating profitability, its investment decisions and sales growth.

After documenting the direct effect of CEOs on firm performance we also investigated the importance of family shocks on firms' outcomes. We argue the deaths of the CEOs immediate family members have a causal impact on firm performance. In contrast to own CEO death events that affect firm performance directly, these alternative shocks affect firms' prospects indirectly. CEO's immediate family deaths and their tragic consequences are likely to reduce the CEOs effectiveness in the business front, leading to significant declines in profitability. We show these personal and business connections are prevalent in both small and large firms. We also show these results are not explained by deceased family members who engage in productive activities relevant to the CEO's firm.

Overall, our paper provides startling evidence that chief executive officers are able to significantly affect firm performance. CEO death analysis shows current chief executives outperform relative to firms' outcomes without them. Similarly, the study of immediate family-deaths demonstrate that, on average, those firms whose CEO is under personal stress are likely to underperform their peers.

Whether these CEO effects are the result of the efficiency value of CEOs, or are alternatively the result of pre-shock strategic behavior (Shleifer and Vishny, 1989) that made chief executives indispensable ex-post, is a topic for further research.

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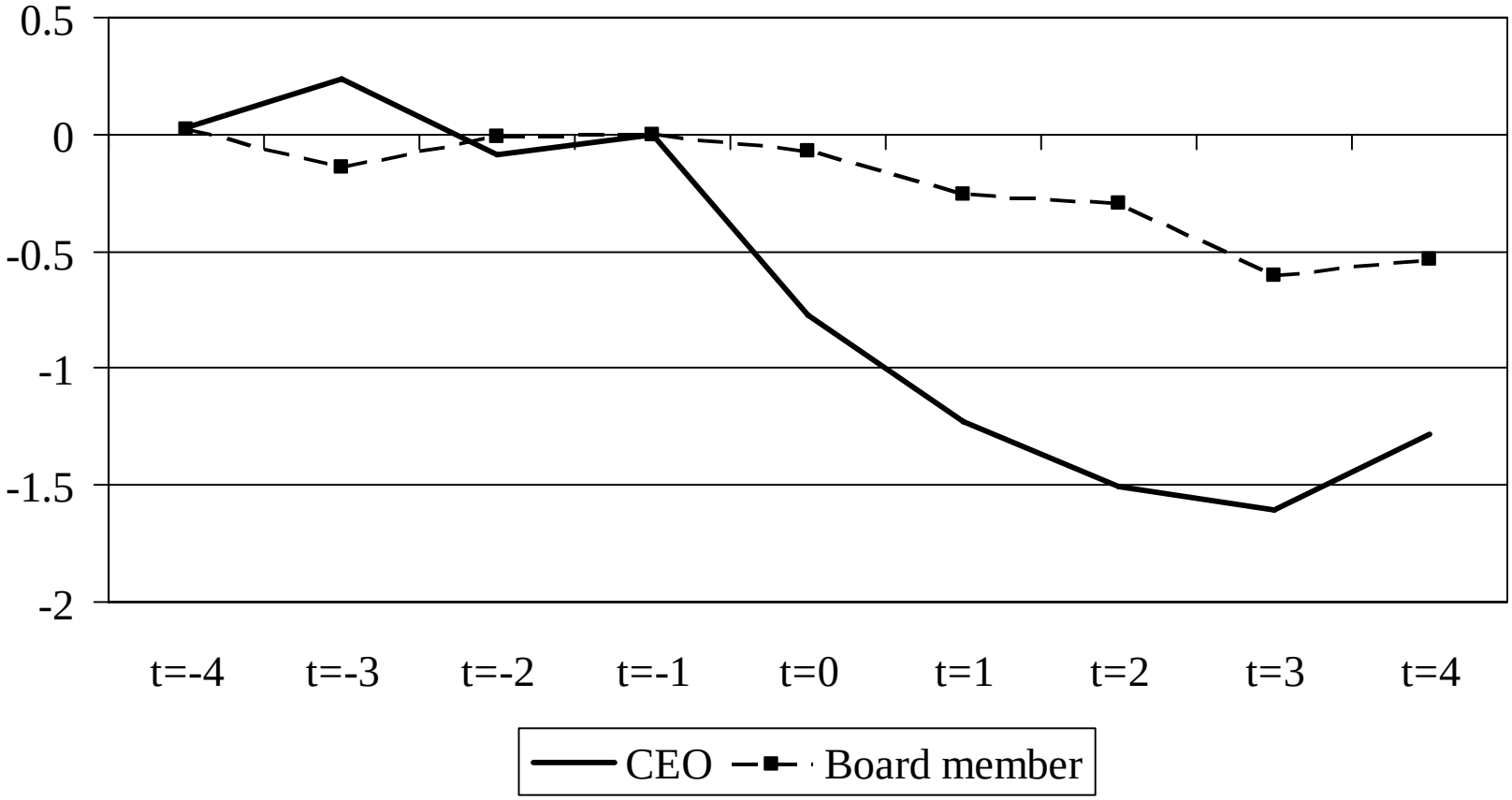
Figure 1. Industry-adjusted operating profitability: all managers and family deaths



Industry-adjusted at *t=-1* is used as a benchmark
Deaths are classified as CEO (board member) deaths whenever they occur to the relevant manager or to his/her spouse, children, parents or parents-in-law
Source: authors' calculations

TABLE I. SUMMARY STATISTICS

Variable	All	Non-Event Firms	Event Firms	Difference
	(I)	(III)	(II)	(IV)
Ln assets	8.130	8.045	8.621	0.576 ***
	(0.0051)	*(0.0053)*	*(0.0148)*	*(0.0158)*
	[74,880]	[63,878]	[11,002]	
Operating return on assets	0.060	0.057	0.077	0.020 ***
(OROA)	*(0.0004)*	*(0.0005)*	*(0.0009)*	*(0.0009)*
	[74,880]	[63,878]	[11,002]	
Net income to assets	0.034	0.032	0.041	0.009 ***
	(0.0005)	*(0.0005)*	*(0.0007)*	*(0.0009)*
	[74,880]	[63,878]	[11,002]	
Industry adjusted OROA	0.0008	-0.0008	0.0098	0.011 ***
	(0.0005)	*(0.0005)*	*(0.0008)*	*(0.0010)*
	[74,880]	[63,878]	[11,002]	
Ln sales	8.144	7.996	8.861	0.865 ***
	(0.0106)	*(0.0112)*	*(0.0279)*	*(0.0300)*
	[33,907]	[28,121]	[5,796]	
Firm Age	11.187	10.197	16.936	6.739 ***
	(0.1237)	*(0.1403)*	*(0.2062)*	*(0.2602)*
	[74,880]	[63,878]	[11,002]	
Asset growth	0.039	0.037	0.045	0.008 ***
	(0.0007)	*(0.0008)*	*(0.0012)*	*(0.0014)*
	[62,371]	[51,386]	[10,985]	
Sales growth	0.034	0.032	0.041	0.009 ***
	(0.0005)	*(0.0005)*	*(0.0007)*	*(0.0009)*
	[24,767]	[19,831]	[4,936]	

Standard errors are in parentheses.
The number of firms are in squared brackets.
***, **, and * denote significance at the one, five, and ten percent levels, respectively.

TABLE II. TOP MANAGEMENT SHOCKS AND FIRM PROFITABILITY

Type of Death	All	Type of Manager: Chief Executive	Type of Manager: Board member	Difference
	(I)	(II)	(III)	(IV)
All	-0.634 ***	-1.001 ***	-0.254	-0.747
	(0.125)	*(0.182)*	*(0.170)*	*(0.0510)*
	[11,002]	[5,597]	[5,405]	
Manager	-0.744 **	-1.444 ***	-0.224	-1.220 *
	(0.309)	*(0.530)*	*(0.367)*	*(0.645)*
	[1,476]	[629]	[847]	
Spouse	-0.872 ***	-1.344 ***	-0.407	-0.937
	(0.322)	*(0.483)*	*(0.425)*	*(0.644)*
	[1,483]	[736]	[747]	
Children	-0.710	-1.626 **	0.464	-2.090 *
	(0.581)	*(0.761)*	*(0.893)*	*(1.173)*
	[415]	[233]	[182]	
Parents	-0.626 ***	-0.911 ***	-0.302	-0.609
	(0.188)	*(0.265)*	*(0.265)*	*(0.375)*
	[5,067]	[2,691]	[2,376]	
Parents-in-law	-0.438	-0.671 *	-0.194	-0.477
	(0.270)	*(0.390)*	*(0.374)*	*(0.540)*
	[2,561]	[1,308]	[1,253]	

Standard errors are in parentheses.
The number of firms are in squared brackets.
***, **, and * denote significance at the one, five, and ten percent levels, respectively.

TABLE III. CEO SHOCKS AND FIRM PROFITABILITY: SIZE QUINTILES

		Type of Death		
Size quintile	**All**	**Chief Executive**	**Family Member**	**Difference**
	(I)	(II)	(III)	(IV)
All	-1.001 ***	-1.444 ***	-0.945	-0.499
	(0.181)	*(0.530)*	*(0.194)*	*(0.0564)*
	[5,597]	[629]	[4,968]	
Smallest quintile	-1.079 *	-2.609	-0.883	-1.726
	(0.567)	*(1.699)*	*(0.601)*	*(1.180)*
	[1,121]	[127]	[994]	
Quintile 2	-1.218 ***	-0.472	-1.290 ***	0.818
	(0.426)	*(1.158)*	*(0.442)*	*(1.163)*
	[1,119]	[98]	[1,021]	
Quintile 3	-0.866 **	-2.283 *	-0.705 *	-1.578
	(0.364)	*(1.186)*	*(0.382)*	*(1.124)*
	[1,119]	[114]	[1,005]	
Quintile 4	-0.853 **	-0.492	-0.901 **	0.409
	(0.334)	*(0.796)*	*(0.363)*	*(0.873)*
	[1,119]	[132]	[987]	
Largest quintile	-0.992 ***	-1.300 *	-0.941 ***	-0.359
	(0.286)	*(0.684)*	*(0.314)*	*(0.751)*
	[1,119]	[158]	[961]	
Difference (largest) vs. (smallest)	0.087	1.309	-0.058	1.367
	(0.635)	*(1.830)*	*(0.678)*	*(1.948)*

Standard errors are in parentheses.
The number of firms are in squared brackets.
***, **, and * denote significance at the one, five, and ten percent levels, respectively.

TABLE IV. CEO SHOCKS AND FIRM PROFITABILITY: BY GENDER

Type of Death	All	Female	Male	Difference
	(I)	(II)	(III)	(IV)
		Panel A. Gender of CEO		
Manager	-1.444 ***	-0.458	-1.513 ***	1.055
	(0.530)	*(1.771)*	*(0.554)*	*(1.184)*
	[629]	[41]	[588]	
Family members	-0.945 ***	-2.226 ***	-0.796 ***	-1.430 **
	(0.194)	*(0.652)*	*(0.202)*	*(0.682)*
	[4,968]	[518]	[4,450]	
Spouse	-1.344 ***	-4.120 ***	-0.698	-3.422 ***
	(0.483)	*(1.072)*	*(0.538)*	*(1.198)*
	[736]	[139]	[597]	
Children	-1.626 **	-3.763 *	-1.458	-2.305
	(0.761)	*(1.845)*	*(0.808)*	*(1.972)*
	[233]	[17]	[216]	
Parents	-0.911 ***	-2.417 **	-0.766 ***	-1.651
	(0.265)	*(1.000)*	*(0.273)*	*(1.039)*
	[2,691]	[236]	[2,455]	
Parents-in-law	-0.671 *	0.428	-0.788 **	1.216
	(0.390)	*(1.146)*	*(0.402)*	*(1.509)*
	[1,308]	[126]	[1,182]	
		Panel B. Gender of Deceased		
Spouse		-0.765	-3.788 ***	3.023 **
		(0.537)	*(1.093)*	*(1.216)*
		[595]	[141]	
Children		-2.271	-1.275	-0.996
		(1.536)	*(0.830)*	*(1.744)*
		[82]	[151]	
Parents		-0.941 **	-0.891 **	-0.050
		(0.377)	*(0.364)*	*(0.524)*
		[1,090]	[1,601]	
Parents-in-law		0.889	-1.668 ***	2.557 ***
		(0.689)	*(0.459)*	*(0.828)*
		[510]	[1,601]	

Standard errors are in parentheses.
The number of firms are in squared brackets.
***, **, and * denote significance at the one, five, and ten percent levels, respectively.

TABLE V. CEO SHOCKS AND FIRM PROFITABILITY: BY AGE AND NUMBER OF CHILDREN

Panel A. Children deaths only		**Age of Child**		
	All	**< 18 years**	**18 or older**	**Difference**
	(I)	(II)	(III)	(IV)
All children	-1.626 **	-3.247 ***	-0.999	-2.248
	(0.761)	*(1.386)*	*(0.907)*	*(1.653)*
	[233]	[65]	[168]	
Number of Children:				
One	-5.179 ***	-5.234 **	-5.148 **	-0.086
	(1.142)	*(2.316)*	*(1.847)*	*(2.948)*
	[30]	[11]	[19]	
Two	-1.993	-3.756 *	-1.303	-2.453
	(1.387)	*(2.046)*	*(1.757)*	*(2.688)*
	[96]	[27]	[69]	
Three or more	-0.300	-1.928	0.250	-2.178
	(1.000)	*(2.495)*	*(1.050)*	*(2.687)*
	[107]	[27]	[80]	
Difference (three or more) vs. (one child)	4.879 ***	3.306	5.398 **	-2.092
	(1.731)	*(3.388)*	*(2.100)*	*(3.956)*

Panel B. All relatives excluding children		**Age of Relative**		
	All	**< 75 years**	**75 or older**	**Difference**
All non-child relatives	-0.912 ***	-0.922 ***	-0.895 ***	-0.027
	(0.200)	*(0.252)*	*(0.327)*	*(0.413)*
	[4,735]	[2,981]	[1,754]	

Standard errors are in parentheses.
The number of firms are in squared brackets.
***, **, and * denote significance at the one, five, and ten percent levels, respectively.

TABLE VI. CEO SHOCKS AND FIRM PROFITABILITY: REGRESSION ANALYSIS

	Dependent Variables:						
	Industry-Adjusted OROA					Asset growth	Sales growth
	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)
Shocks	-0.3168 **	0.0692					
	(0.1345)	*(0.1779)*					
CEO shocks		**-0.7664 *** **	**-0.6937 *** **	**-0.6313 *** **	**-0.5444 ** **	**-0.899 *** **	**-2.224 *** **
		(0.2633)	***(0.1974)***	***(0.1826)***	***(0.2631)***	***(0.3707)***	***(0.7642)***
Ln assets	2.6501 ***	2.6502 ***	2.6524 ***	2.6496 ***	2.6211 ***	19.194 ***	10.7840 ***
	(0.0802)	*(0.0802)*	*(0.0812)*	*(0.0792)*	*(0.0804)*	*(0.2488)*	*(0.4248)*
Firm age	-0.3027 ***	-0.3026 ***	-0.3035 ***	-0.3024 ***	-0.2997 ***	-0.9852 ***	-1.1144 ***
	(0.0132)	*(0.0132)*	*(0.0132)*	*(0.0130)*	*(0.0131)*	*(0.0280)*	*(0.0550)*
Year controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Window for event firms	[t=-2,t=+2]	[t=-2,t=+2]	[t=-2,t=+2]	[t=-4,t=+4]	[t=-4,-3] and [t=+3,t=+4]	[t=-2,t=+2]	[t=-2,t=+2]
Type of shocks	All	All	CEOs only	CEOs only	CEOs only	CEOs only	CEOs only
Number of shocks	11,002	11,002	5,597	5,597	5,364	5,585	2,494
Number of firms	74,880	74,880	69,475	69,475	69,242	56,970	21,754
Firm fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	423,322	423,322	399,097	412,514	396,438	313,864	93,951
Adjusted-R^2	0.3032	0.3032	0.2989	0.2970	0.2961	0.1848	0.1293

Standard errors are in parentheses. ***, **, and * denote significance at the one, five, and ten percent levels, respectively.

TABLE VII. MANAGER AND SHOCK CHARACTERISTICS

	Dependent Variable: Industry-Adjusted OROA						
	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)
Shocks	-0.1991	0.2091	0.1818	0.3549	0.2862	0.1810	0.1625
	(0.2168)	*(0.2483)*	*(0.2626)*	*(0.2636)*	*(0.3098)*	*(0.2850)*	*(0.2874)*
CEO shocks		**-0.7998 *** **	**-0.7948 *** **	**-0.8822 *** **	**-0.7919 *** **	**-0.7947 *** **	**-0.7560 *** **
		(0.2615)	***(0.2850)***	***(0.2678)***	***(0.3098)***	***(0.2850)***	***(0.2874)***
Manager direct shocks			0.1704	0.1742	0.1413	0.1712	0.1920
			(0.4299)	*(0.4299)*	*(0.4314)*	*(0.4303)*	*(0.4307)*
*CEO * Manager direct shocks*			0.0305	0.0305	0.0194	0.0304	-0.0084
			(0.7289)	*(0.7289)*	*(0.7296)*	*(0.7289)*	*(0.7298)*
Female manager				-0.6437 *	-0.4386		
				(0.3603)	*(0.4133)*		
*CEO * Female manager*					-0.6008		
					(0.8044)		
Shocks children < 18 deaths						0.0530	1.5214
						(1.0773)	*(1.5315)*
*CEO Shocks * Children < 18 deaths*							-2.9842
							(2.1362)
Year controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Window for event firms	[t=-2,t=+2]	[t=-2,t=+2]	[t=-2,t=+2]	[t=-2,t=+2]	[t=-2,t=+2]	[t=-2,t=+2]	[t=-2,t=+2]
Type of shocks	All	All	All	All	All	All	All
Number of shocks	11,002	11,002	11,002	11,002	11,002	11,002	11,002
Number of firms	11,002	11,002	11,002	11,002	11,002	11,002	11,002
Firm fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	49,012	49,012	49,012	49,012	49,012	49,012	49,012
Adjusted-R^2	0.3715	0.3717	0.3717	0.3717	0.3717	0.3717	0.3717

All regressions include controls for the natural logarithm of assets, and firm age. Results not shown.
Standard errors are in parentheses. ***, **, and * denote significance at the one, five, and ten percent levels, respectively.

TABLE VIII. FIRM AND INDUSTRY CHARACTERISTICS

	Dependent Variable: Industry-Adjusted OROA							
	One year prob of survival<0.25	One year prob of survival ≥ 0.25	One CEO Structure	Dual CEO Structure	Slow Industry Growth	Fast Industry Growth	High Labor Force Schooling Levels	Low Labor Force Schooling Levels
	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)
CEO shocks	-2.0701 **	-0.6930 **	-0.9635 ***	-0.4732	-0.6692 *	-0.9115 **	-0.9848 **	-0.5440
	(0.8158)	*(0.3001)*	*(0.2750)*	*(0.5797)*	*(0.3608)*	*(0.3773)*	*(0.4438)*	*(0.4087)*
Shocks	0.5294	0.2820	0.3627	-0.2500	0.0524	0.3583	0.4111	0.2536
	(0.7141)	*(0.2833)*	*(0.2750)*	*(0.5793)*	*(0.3322)*	*(0.3672)*	*(0.4041)*	*(0.3938)*
Firm fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Window for event firms	[t=-2,t=+2]	[t=-2,t=+2]	[t=-2,t=+2]	[t=-2,t=+2]	[t=-2,t=+2]	[t=-2,t=+2]	[t=-2,t=+2]	[t=-2,t=+2]
Type of shocks	All	All	All	All	All	All	All	All
Number of shocks/shocks	1,156	7,674	8,505	2,497	5,506	5,460	4,042	4,102
Firm fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	5,379	35,816	37,785	11,227	24,729	24,139	18,009	18,561

All regressions include controls for the natural logarithm of assets, and firm age. Results not shown.
Standard errors are in parentheses. ***, **, and * denote significance at the one, five, and ten percent levels, respectively.