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Who loses a leader without losing ground? Unexpected deaths in top management teams and firm performance

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Abstract

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I argue that organizational stability and inertia reduces the negative e ect of this organizational shock, leading to higher post-death performance. Supporting this, I find that continuity in the top management team and higher employee tenure mitigate the negative e ects of an unexpected death, while higher past turnover rates make the rms more vulnerable to this organizational shock.

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Keywords: Top management succession, top management turnover, organizational shock, organizational disruption, organizational change and performance.

Introduction

Being at the head of firm strategy and being responsible for firm efficiency and employee achievements, top managers can be crucial to firm performance. The impact of top management turnover is thus *'critically important and yet unique and separate from turnover at other levels'* (Kesner and Sebora, 1994, p. 329). One reason is that top management turnover might trigger a disruptive shock for the firm, temporarily incapacitating organizational structures and routines (Carroll, 1984; Johnson et al., 1985; Haveman, 1993; Kesner and Sebora, 1994; Shen and Canella, 2002). Top management turnover might thus induce negative effects on firm performance. Therefore, the questions put forth in this paper are whether such a potential disruptive change to the top management team (TMT) is equally harmful to all organizations or whether, and why, some organizational characteristics might mitigate the negative impact of this shock. In other words, can firms equip themselves to reduce the shock-effect of *losing a leader*?

Intuitively, organizations that develop flexible routines and adaptive capacities are better prepared to cope with organizational disruptions such as top management turnover. Conversely, organizational inertia (Hannan and Freeman, 1984) might circumscribe an organization's willingness and ability to act and adapt or limit its ability to perceive the need to do so, resulting in negative effects on the firm's post-turnover performance (Tushman and Rosenkopf, 1996; Hannan, 2005; Hannan et al., 2006; Dahl, 2011). This suggests that older, highly routinized and inert organizations are more vulnerable to the organizational disruption of losing a leader. This paper, however, suggests an alternative hypothesis, arguing that firms characterized by organizational stability are, on average, more resistant to disruptive changes to the TMT and have a less negative shock to subsequent performance.

While more inert and routinized organizations might be slower or unable to adjust to changing environments, they might also have more efficient productions than highly flexible organizations. This increased efficiency is partially due to their efficiently routinized behaviour, including better activity coordination and a more efficient resource exploitation (Nelson and Winter, 1982; Cohen and Bacdayan, 1994; Becker, 2004). Moreover, flexibility and adaptability imply that the firm employs excess resources and therefore has relatively higher production costs (Hannan and Freeman, 1977). For these reasons, stronger and more efficient organizations might be better equipped to handle disruptive events. This further implies greater competitiveness and organizational capabilities (Le Mens et al., 2011). The latter might serve as a buffer for disruptive organizational shocks, preventing fatal outcomes. Another argument why organizational stability reduces the negative shock-effect builds on these organizations' presumed stronger structural inertias, i.e., greater resistance and less flexibility to organizational change. Because stronger inertial forces work against and hinder potentially detrimental organizational

changes from occurring, the consequences of losing a top manager might be less severe with smaller organizational changes and performance effects.

The preceding points implicitly assumes that top management turnover implies an organizational loss with negative effects on performance. However, firms sometimes decide to terminate members of the TMT. Firms might initiate these TMT changes to improve performance or to signify change to external shareholders (Wiersema and Bantel, 1993; Kesner and Sebora, 1994; Boyne et al., 2011). This suggests that poor performance increases the likelihood of top management turnover (He et al., 2011). Conversely, managers with extraordinary abilities, presumably employed in better performing firms, are more likely to be headhunted, indicating a positive correlation between TMT turnover and firm performance or perhaps post-turnover performance (Hayes and Schaefer, 1999). Top management turnovers thus rarely happen randomly. A general critique of the studies that investigate performance-effects from top management turnover is their inability to conclusively determine causality between this event and the firm's post-event performance. This leaves the evidence on the impact of top management turnover on firm performance somewhat inconclusive (Carroll, 1984; Bonnier and Bruner, 1989; Haveman, 1993; Shen and Canella, 2002; Chang et al., 2010; Boyne et al., 2011; He and Sommer, 2011; He et al., 2011).[1]

I address the above endogeneity problem by exploiting the exogenous variation in firm performance following 651 unexpected deaths in top management teams. Using a comprehensive dataset, containing yearly observations of all Danish firms from 1995 to 2006, I investigate which firm characteristics mitigate the disruptive organizational shock of losing a leader and increase post-death performance. These events, I argue, are randomly assigned and therefore uncorrelated with the firms' prior performance (Bennedsen et al., 2010). Moreover, as unexpected deaths draw randomly from the distribution of top managers, these top managers' abilities should reflect the population average (Hayes and Schaefer, 1999). Few studies apply a similar methodology, exploiting the exogenous event of unexpected executive deaths to estimate the significance of top managers, CEOs, independent directors, and founders to firm performance (Johnson et al., 1985; Worrell et al., 1986; Hayes and Schaefer, 1999; Bennedsen et al., 2010; Hvide, 2009; Nguyen and Nielsen, 2010).[2] These studies generally confirm a negative relation between top managers' deaths and post-death performance. While these studies focus on the value of differences in managerial ability and establishing the consequences of executive turnover, I apply an organizational theory perspective to investigate which firm characteristics influence post-death performance.

I find that organizations that increase organizational stability through TMT

[1] See Karaevli (2007) for an exhaustive overview of empirical studies of the effects of top management turnover.

[2] Other recent papers, that use unexpected death as an exogenous event to study causal effects, include Jones and Olken (2005); Azoulay et al. (2010); Andersen and Nielsen (2012).

continuity, i.e., by increasing TMT tenure or reducing turnover, are better prepared to cope with top management unexpected death and the simultaneous organizational shock. I find similar results for continuity in the employee composition. Increasing organizational stability thus results in a less disruptive effect on the organization and better post-shock performance. I thus conclude that firms can, to some extent, build organizations that are better equipped to handle and resist the negative shock of top management unexpected death. Moreover, I argue that these results might also apply to other types of exogenous organizational disruptions. The results emphasize the important role of top management and employee stability in establishing efficient and routinized organizations that are better equipped to handle disruptive organizational shocks. This finding suggests increasing focus on employee retention strategies, for example, employee shares, terms of notice, or non-competition agreements.

Effects on firm performance from top managers' unexpected deaths

Extensive organizational changes punctuate and reset the process of establishing efficient organizational routines (Tushman and Rosenkopf, 1996). Altering established organizational action patterns destabilizes the organization and negatively affects organizational performance because of subsequent lower productivity. While this is not a permanent state, realigning the organization, re-establishing efficient patterns of activity, and adapting to the new context take time. However, conditional on survival, an organization can rebuild its internal processes (Amburgey et al., 1993). This process is often called 'resetting the liability of newness clock', comparing the post-disruption situation with the conditions and challenges that face new firms and increase their potential to fail. An unexpected death in the TMT might be an example of such a destabilizing activity. This shock disrupts the internal functioning of the organization, as the loss of a top manager leaves gaps in the organizational structure. This alteration of organizational structures affects decision-making processes in the firm, and at best, involves implementing new and efficient organizational routines. This process takes time, during which organizational performance is less efficient. Moreover, the alternate top manager might differ from his/her predecessor in competencies, management style, strategic focus and prioritization (Shen and Canella, 2002). This difference might further complicate and prolong the process, as both routines and organizational norms are challenged. In addition, a shift in focus, a lack of decision-making authority, and committing resources to the restructuring process might lead to missed business opportunities (Hannan et al., 2007). All together, this leaves the post-shock organizations less efficient than before and

thereby further hampering post-shock performance.

Top management unexpected death also implies a human capital loss. The negative performance-effect of losing a leader increases with his/her human capital, particularly firm-specific human capital (Johnson et al., 1985; Eriksen, 2011). Because top managers often perform non-routine and idiosyncratic tasks, their organization-specific human capital is higher than that of other employees. First, this implies a relative greater drop in the firm's human capital stock. Second, the idiosyncratic character of their work makes the process of finding a suitable replacement difficult and long-lasting. This difficulty implies high recruiting and selection costs, especially those associated with training and learning organization-specific skills (Johnson et al., 1985; Eriksen, 2011). Top management unexpected death is thus particularly detrimental to firm performance. The alternate top manager might also have different competencies, for example, technical, academic and managerial skills, than his/her predecessor. He/she might have a different managerial style, focus, and prioritization, for example, different prioritization regarding fields of work and divisions due to personal commitment and areas of interests. These differences might further prolong and complicate the restructuring phase, thus reducing efficiency and performance.

After developing organization-specific skills, a potential successor might renew and strengthen the firm's competencies. He/she might bring new knowledge, perspectives, ideas, and social capital (networks) to the firm, potentially increasing firm efficiency and competitiveness (Tushman and Rosenkopf, 1996; McKendrick et al., 2009; Eriksen, 2011). These improvements suggest that the expected negative effect of top management death might reverse over time. While organizational changes might be disruptive and negatively affect firm performance, they are sometimes imperative. Baron and Hannan (2002) show that changing an organization's blueprint appears to be most disruptive when implemented by the original CEO. They further propose that this reflects the nature of the implicit contract between employees and management (Baron and Hannan (2002), p. 22). This suggests that top management turnover might sometimes provide an opportunity to change core organizational features with less disruptive effects. Supporting this theory, Tushman and Rosenkopf (1996) argue that firms might exploit top management changes as an adaption mechanism in turbulent environments.

The above argues that top management unexpected deaths cause a drop in organizations' firm-specific human capital stock and trigger disruptive organizational shocks. On average, these shocks leave the post-shock organizations less efficient than before, which result in declining firm performance. In the following sections, I develop hypotheses about which firm characteristics potentially enhance and mitigate the shock-effect. In addition to these internal factors, other external factors might affect the post-death performance. By asking whether firms can 'equip themselves to reduce the shock-effect of losing a leader', this paper solely examines internal factors and does not investigate

the effect of the firms' environmental contexts on performance. However, I discuss the significance of external factors to the paper's conclusions in a later section.

Organizational characteristics and post-shock performance

The following sections discus which organizational characteristics that might mitigate the negative performance effects from top management unexpected death. Overall, I argue that organizational stability reduces the negative effects, increasing post-shock performance. I suggest three variables that might imply greater organizational stability and, hence, increase post-shock performance. These variables are, firm age, continuity in the TMT team, and employee tenure.

Organizational stability and firm age

Unstable environments require that organizations develop the capacity to adapt by employing excess resources. In a more stable environment, however, this implies lower efficiency and thus lower competitiveness (Hannan and Freeman, 1977). Selection therefore favors organizational stability and reliability in a stable context (Carroll, 1983; Freeman et al., 1983; Hannan and Freeman, 1984; Baron et al., 2001; Hannan et al., 2007). Intuitively, however, flexibility and adaptability might better equip organizations for exogenous and sudden organizational disruptions. Moreover, organizational inertia might circumscribe the organization's willingness and ability to act and adapt or limit its ability to perceive the need for change, as phrased by Tushman and Rosenkopf: *'It (inertia) anchors the organization to its past, even in the face of turbulent contexts'* (Tushman and Rosenkopf (1996), p. 942). Contrary to this view, this paper hypothesizes that (past) organizational stability might reduce the expected negative shock-effect from top management unexpected death. Stable, i.e., inert, organizations are, on average, more resistant to top management unexpected death and show less negative shock to subsequent performance.

Assuming a stable context, the above paragraph argues that organizational stability and stronger inertia increase firm efficiency. This includes the formal organizational structure and routines, as well as organizational norms or culture (Hannan and Freeman, 1977). Efficiently routinizing activity patterns is essential, as it implies better coordination of organizational actions, i.e., a more efficient exploitation and integration of the organization's knowledge and resources. Finally, organizational members in instable organizational environments who lack the willingness to try to engage themselves in acquiring organization-specific skills that are necessary to establish efficient routines might reinforce the previously described disadvantage of organizational instability (Hannan and Freeman, 1984). However, developing efficient routines takes time. The process of devel-

oping these routines includes developing social trust relationships among employees, management and external parties. Moreover, efficient routines evolve from learning-by-doing experience and stable repeated interactions among organizational members. Building on its experience, the organization establishes and continuously improves its organizational routines. Increasingly coherent and efficient routines thus evolve gradually over time (Stinchcombe, 1965; Nelson and Winter, 1982; Tushman and Rosenkopf, 1996; Sorenson and Sørensen, 2001; Hannan et al., 2006). These arguments suggest that organizational efficiency is higher in older firms, with all else being equal. Moreover, assuming that stronger firms with more efficient routines are less vulnerable to disruptive organizational shocks, the negative effect of top management unexpected death might decrease with firm age.

Organizational ecologists, studying the effects of fundamental organizational change, build on the premise that organizations are subject to strong inertial forces. Increasing inertia implies decreasing the speed at which organizational structures can change (Hannan and Freeman, 1984). Following the above arguments, continually enhancing organizational routines according to organizational stability reinforces organizational inertia. As a result, these organizations become inherently resistant to change. This suggests that organizations with stronger inertia are more resilient to disruptive organizational shocks, with less negative effects on subsequent performance. First, Baron and Hannan (2002) and Hannan et al. (2006) argue that CEO turnover tends to affect subsequent performance because top management turnover often coincides with changing the organizational blueprint. A negative effect of TMT turnover, or top management unexpected death, might be contingent on the event triggering substantial organizational change, thus altering established processes and organizational norms. However, if organizational inertia is strong, building on multiple periods of refining efficient and deeply rooted routines, these routines are not easily altered. When a changing context calling for reorientation collides with strong internal forces that pull the organization in opposite directions, the prevailing outcome for strong inertia might be retaining the status qou. Stronger inertia may thus limit the expected negative effects from losing a leader. Because structural inertia increases with time, older firms might experiences a relatively smaller drop in post-death performance, with all else being equal. This smaller change in performance, however, is due to inertial forces working against and preventing potentially detrimental subsequent organizational changes from occurring, rather than a smaller disruptive shock to the organization per se. Supporting this, Amburgey et al. (1993) show that even though organizational vulnerability to disruptions increases with firm age, the net effect on firm performance from organizational disruptions decreases, because organizational inertia decreases the likelihood of change (Amburgey et al., 1993).

H1: The negative shock-effect of top management unexpected death decreases

with firm age.

In addition to the above arguments, firm age increases both employee tenure and the likelihood of insider turnover; the latter is replacement by an employee from within the firm. Because insider turnover is associated with less post-turnover organizational change and thus less disruptive effects on post-turnover performance, this adds further support to Hypothesis 1 (Kesner and Sebora, 1994; Shen and Canella, 2002). Moreover, because firms develop efficient routines and learn from experiences, older firms might be better equipped for top management unexpected death, as they are more likely to have previously experienced non-routine top management turnover.

Continuity in the top management team

The above arguments univocally suggest that organizational stability is an important factor in determining how top management unexpected death affects firm performance. In Hypothesis 1, I operationalize this as stability reflected by firm age. In addition, this section argues that organizational stability also includes stability in the TMT. An additional objective organizational stability measure in this paper, considering the data at hand, is therefore TMT tenure or past TMT turnover. The potential significance of the TMT composition is especially interesting because it, as opposed to firm age, suggests that organizations may prepare themselves to handle the disruptive organizational shock from top management unexpected death.

The paper relies on the premise that top management unexpected death is detrimental to firm performance. This negative effect primarily occurs because the event disrupts organizational routines, leaving the post-shock organization less efficient. Other types of top management turnover might have similar destabilizing effects. Organizations with recent changes in the TMT are weakened, with all else being equal, and might therefore be ill-prepared to handle this disruptive shock. Supporting this argument, Meyer (1975) shows that management continuity is a concomitant of organizational stability and organizational structure predictability in finance departments. Therefore, we might expect that higher TMT tenure decreases the negative effect of top management unexpected death because it reflects past TMT stability.

Adding support to a potential mitigating effect of TMT tenure on post-death performance, I build on previous arguments, suggesting that higher TMT tenure might result in smaller subsequent organizational changes with fewer negative effects on subsequent firm performance. Furthermore, if the effect of top management unexpected death depends on whether the event triggers substantial organizational change (Baron and Hannan, 2002; Hannan et al., 2006), then his/her subsequent replacement is important (Shen and Canella, 2002). Potential disruptive effects triggered by organizational change initi-

ated by the successor might depend on the power balance between the successor and the organization, particularly incumbent top managers. For now, I refrain from discussing other potentially counterbalancing effects from this aspect of TMT turnover, for example, concurrent human capital inflow, though I return to this discussion below.

Developing this argument, at least two matters need consideration. First, the CEO and/or board of directors might use top management turnover to change core features of the organization. Second, potential successors differ in their desire to signal a change of track. As suggested above, top management turnover might facilitate the organizational change process (Shen and Canella, 2002). However, when an unexpected death triggers top management turnover, it is an unplanned and non-routine event. Such an opportunity for strategic reorientation happens by accident and is not easily considered. Moreover, one might argue that when there is a strong desire for facilitating reorientation through top management turnover, it would have been initiated earlier, i.e., before top management unexpected death. Considering a potential successor's incentive to engage in or signal a new direction, for example, regarding management style or strategic focus, previous studies show that the type of successor matters (Shen and Canella, 2002; Perry et al., 2011; Quigley and Hambrick, 2012). *'New leaders are under some pressure to demonstrate their efficacy and worthiness, and they typically cannot do this by simply maintaining the status quo'* (Quigley and Hambrick (2012), p. 836-837). Internal contenders and outsiders are likely to chart different courses than followers, who have less cause to demonstrate their worth through a shift in management style or by restructuring the organization or introducing new strategies or markets (Shen and Canella, 2002). In this context, it is interesting to see which organizations allow for such greater strategic and organizational change. Quigley and Hambrick (2012) find that CEO succession leads to smaller post-succession performance changes when the predecessor stays with the company as chairman of the board. They argue that this occurs because the predecessor directly or indirectly restricts the actions of his/her successor. This restricts the successors opportunities to influence firm performance (Quigley and Hambrick, 2012). Following similar arguments, incumbent top managers may play a similar role following top management unexpected death. When more, longer-tenured, and thus stronger top managers comprise the incumbent TMT, there may be a greater capacity to withstand the pressure from a potential successor's eagerness to shake-up the organization. Moreover, such a TMT constitution might be more committed to the status qou, further reinforcing the internal reluctance to organizational change (Karaevli, 2007). This might reduce the likelihood that the organization chooses to bring new members into the TMT who intend to challenge established routines. This possibility further supports the proposition that organizational stability, especially when affected through a strong and continuous TMT, diminishes the negative shock-effect from top management unexpected death. I therefore hypothesize the following:

H2: Higher TMT tenure reduces the negative shock-effect of top managers' unexpected deaths, leading to higher post-death performance.

Building on Hypothesis 2, I extend the above arguments to include other employees as wells. The employees play an important role in driving the organizational routines and ensuring the smooth-functioning of the organization. At the end of the day, it is the employees who live the organizational culture and norms, perform many operational routines, and execute the course chartered by the TMT. For these reasons, higher employee tenure implies increased organizational stability. Echoing the above arguments, I suggest that organizational stability through higher employee tenure might lead to higher post-event performance. I thus hypothesize:

H3: Higher employee tenure reduces the negative shock-effect of top managers' unexpected deaths, leading to higher post-death performance.

Organizational shocks, for example, TM unexpected death, might trigger excessive employee turnover with negative effects on firm performance. Excessive employee turnover destabilizes organizational structures and routines and implies a human capital loss (Baron et al. (2001), Eriksen (2011), Eriksen (2012)). However, because employees with higher tenure are less likely to leave the firm, higher employee tenure might add to post-event organizational stability and reduce the negative effect of top management death (Robinson and Rousseau, 1994; Baron et al., 2001). This adds further support to Hypothesis 3.

Method

Data

I investigate the effect on firm performance from top managers' unexpected deaths using the Danish Database for Labor Market Research (IDA). Statistics Denmark maintains the IDA. It is constructed for research purposes and combines official registers from the Danish government. It contains detailed information on all Danish firms (e.g., accounting figures and industry) and their employees (e.g., salary and education). Moreover, Statistics Denmark provides information on the date of death for all individuals. This information can be linked to the IDA. The IDA is a longitudinal database and has annual information from 1980 to 2007. However, firm sales, which is one of two firm performance measures, is not introduced until 1995, restricting the estimation period from 1995 to 2007. Previous studies using the IDA include Sørensen (2007), Nanda and Sørensen (2010) and Dahl

(2011).[3]

The IDA provides identification codes for both the plant and the employer levels (ownership). I base my definition on the latter. Thus, a single firm (employer/owner) may contain multiple plants. Investigating firm performance, I only include privately held firms with 10 or more full-time equivalents in most years from 1995 to 2007. Moreover, I exclude public firms and the heavily regulated primary sector. To determine firm exit, I accept a single year without activity[4]. If a firm is not active for two successive years, I consider the firm closed. I do not accept re-entry, thus dropping subsequent observations from the data. I determine firm age, counting from the first year of activity in the database. I do not observe the firms before 1980. I thus cannot predict the exact age of firms that were already active in 1980.

Statistics Denmark provides information on the date of death for all deaths in the labor force. I identify top managers using their occupational codes in the IDA.[5] Table 1 shows that the average number of top managers in firms without top management unexpected death is 1.89, corresponding to approximately one top manager per 23 employees. Firms that experience top management unexpected death are generally larger and have, on average, 9.52 top managers, corresponding to approximately 26 employees per top manager. I expect the significance of single individuals, and thus the effect of top management unexpected death, to differ with firm size, including the number of employees and top managers in each firm. I control for this in the analysis.

I use a very restrictive definition to identify unexpected deaths. First, I only include individuals younger than 70 (but older than 18).[6] Second, I exclude individuals who have received any sickness benefits during their final year. Third, to control for a top manager being affiliated with the most recently observed employer at the time of death, I only include individuals with 'death' stated as their employment status for the following year. The latter is not possible for 2007, as employment status for 2008 is not available. This restricts the observation period to 2006. Finally, I only allow for a single event per firm. Multiple unexpected deaths within a single year are, however, possible and treated as one event. If a second unexpected death occurs in the TMT, subsequent observations are dropped. This leaves a sample of 651 unexpected deaths in TMTs from 1995 to 2006.

[3]Timmermans (2010) provides a detailed description of this database, its applications, strengths, and weaknesses.

[4]Less than one full-time equivalent.

[5]In the database, the occupational code for 'top manager' and 'CEO' is the same and both are included in my definition.

[6]To control my results sensitivity to this age limit, I re-estimated the primary models of the analysis, excluding individuals older than 55. I shall return to this in a later section.

Estimations and dependent variables

I use sales and employment growth rates as performance indicators when I investigate the effect of top managers' unexpected deaths on firm performance. One advantage of growth rates over, for example, survival time is that growth rates can capture transient performance shocks that may not necessarily result in firm exit. Even if this shock eventually leads to failure, one would expect declining sales and employment level to come before a complete withdrawal from the market (Almus, 2004). Therefore, a negative effect on firm survival from this shock should be reflected in estimations of growth rates, as well as expected survival time. However, growth rates estimations are less restricted by a short observation period.

I estimate the performance of firms where a TMT member dies and compare it with the performance of firms that do not experience unexpected TMT deaths. I interpret differences in performance, after controlling for firm heterogeneity, as being due to the disruptive organizational event of losing a leader. I estimate the effect of TMT unexpected deaths on firms' sales and employment growth using firm fixed effects, as I assume that unobserved but fixed firm characteristics affect firm performance (Angrist and Pischke, 2009).

Key explanatory variables

I include a dummy variable for top managers' (TM) unexpected deaths, *TM death*. This variable takes a value of one in all years after the event. I also include a clock variable, *Time since TM death*$_t$, to analyze how the shock-effect evolves over time. This clock variable counts the number of years since the event. Initially, it takes the value zero in year t, the value one in year $t+1$, the value two in year $t+2$, and it continues to grow similarly. While I only have annual observations on firm performance, I know the exact date of death. Depending on how quickly the firms respond to and recover from the shock, the effect on firm performance might be sensitive to the accuracy with which the event is dated. Controlling for this, I add $(1-(\textit{month of death}/12))$ to *Time since TM death*$_t$. If the top manager dies in January (month is one), *Time since TM death* is 1.92 in year $t+1$. Equivalently, if he/she dies in December, the clock variable takes the value one in year $t+1$.

I include interactions terms with *TM death* to estimate the significance of different firm characteristics (see e.g., Brambor et al. (2006)). All interaction terms correspond to firm and employee characteristics in the year of the event. This approach thus identifies factors that might better equip firms for such unanticipated events and reduce the shock-effect. First, I include the interaction term between *TM death* and *Firm age, logged* to test Hypothesis 1.

To test Hypothesis 2, I estimate the interaction effects between *TM death* and

TMT tenure. The latter is the number of years that the top manager has been employed at the firm. If I observe more than one top manager in the firm, *TMT tenure* is the average for the top management team. If I do not identify any top managers, *TMT tenure* is zero. Finally, I test Hypothesis 3, including the interaction term between *TM death* and *Employee tenure*. In addition, I estimate the effect of stability/changes to the firm's workforce, including the interaction term between *TM death* and the yearly employee turnover ratio during the final three years up to the event. Similarly, I include the interaction term between *TM death* and the average TMT turnover ratio preceding the event. Table 1 provides descriptive statistics.

– – – Insert Table 1 here – – –

Results

Table 2 compares firm size and growth rates before and after TM unexpected death. I divide the firms into three categories: 1) firms that do not experience TM unexpected death, 2) firms that have not yet experienced TM death but will do so, and 3) firms that have experienced TM death. I shall refer to the latter two as the treatment group.

– – – Insert Table 2 here – – –

The event of TM unexpected death is random. However, the number of top managers increases with firm size, and the number of top managers proportionally increases the likelihood of TM unexpected death. The firms in the treatment group are thus, on average, expected to be significantly larger than firms in the control group. This is confirmed by Table 2. Whereas the firms in the treatment group do not show significant differences in firm size before and after the event, post-event growth rates are significantly lower than ex ante-event growth rates. This strong reduction in average growth rates indicates a negative effect on firm performance from this shock.

Performance-effects of TM unexpected death

To investigate how the shock-effect of top management unexpected death differs with firm characteristics, I estimate firm fixed effects models of employment growth. Estimations are based on 149,931 firm-year observations from 1997 to 2006 for 23,645 unique incumbent firms. Tables 3 and 4 present the results.

– – – Insert Table 3 here – – –

All models in Table 3 confirm a negative effect from top management unexpected death on firm performance. This effect decreases with time. Overall, the models indicate that firm age, employee tenure, TMT tenure and TMT turnover have negative effects on employment growth.

Model 2, presented in Table 3, tests Hypothesis 1, suggesting that the effect of TM unexpected death decreases with firm age. The model does not support the hypothesis, as the coefficient estimate of the interaction term with firm age is insignificant. In other words, I cannot confirm a mitigating effect on post-shock performance from firm age at the time of death. However, estimates may be subject to a selection bias, as firms exit the population. We know that TM unexpected death is associated with an increasing hazard of failure.[7] If this effect is stronger for younger firms, it might explain the lacking significance of the interaction term in Model 2 in Table 5.[8]

Model 3 tests Hypothesis 2, including the interaction term between *TM death* and *TMT tenure*. In general, TMT tenure has a negative effect on sales growth. However, Model 3 finds that TMT tenure reduces the negative effect of TM unexpected death. This finding supports the hypothesis that higher TMT tenure increases organizational stability and makes organizations more resistant to disruptive organizational shocks. However, while higher TMT tenure reduces the negative shock-effect, the death of a long-tenured TM might work in the opposite direction with significant effects on firm performance. Model 4 tests this, controlling for the deceased top managers tenure at the time of death. This control does not alter the previous conclusion, as the interaction term with TMT tenure remains significant and positive.

One could argue that if TMT tenure reduces the negative effect of TM unexpected death, it might be because longer TMT tenure is associated with better performing firms. In other words, TMT tenure might increase performance, but performance might also increase TMT tenure (Wiersema and Bantel, 1993). Contradicting this, Tables 3 and 4 show that TMT tenure generally reduces *Employment growth, t*. Furthermore, I find a negative correlation bewteen between *TMT tenure, t* and my indicator of past performance, the average employment growth rate from *t-3* to *t-1*.[9]

Nevertheless, Model 5 controls for this, including a variable for the treatment group's average performance in the past three years before the event. The interaction term between *TM death* and performance three years before the event show a significant and

[7] In addition to the sales and employment growth models, I estimated models of firms survival. The survival analysis confirmed a negative effect on firm survival from top management unexpected death. However, the number of events is apparently insufficient to investigate how these firms differ from others in the treatment group. That is, all interaction effects are insignificant. Hence, the survival models cannot confirm (or reject) any of the hypotheses. Results are available upon request.

[8] One way to account for this potential selection bias is to estimate selection-corrected sales growth models. However, the database does not provide any appropriate instrument variables for this task. I thus cannot account for potential selection bias in the sales growth models.

[9] Correlations tables are not included in this version of the paper, but are available upon request.

negative effect on employment growth. This is consistent with the results of Boyne et al. (2011) who argue that the performance effects of TM succession are contingent on prior performance. They find a negative effect of TMT turnover in high-performing organizations, while low-performing organizations seem to benefit from TM turnover. Controlling for performance prior to the event, however, does not alter the previous conclusion. Thus, Model 5 finds that the mitigating effect of TMT tenure is robust to this control, adding further support to Hypothesis 2.

– – – Insert Table 4 here – – –

Model 1 in Table 4 tests Hypothesis 3, investigating the effect of employee tenure. The model supports hypothesis 3, showing a positive effect on employment growth from the interaction term between TM death and employee tenure in the death-year. Because employee tenure is negatively correlated with recent growth, Model 2 in Table 4 also controls for past performance, by including the three-year moving employment growth average from the death-year. Again, this does not alter the result.

Models 3 and 4 in Table 4, present an additional test of the role of organizational stability, by further investigating the performance effect of turnover. Generally, TMT turnover has a negative effect on employment growth, and in the event of top management sudden death, recent TMT turnover (past three years) increases the negative effect (see Model 3). This adds further support to Hypothesis 2, emphasizing the important role of TMT stability in overcoming disruptive organizational shocks. Regarding employee turnover, Model 4, Table 4, confirms the result in previous studies, showing a negative effect on employment growth from employee turnover (past three-year moving average). Moreover, higher employee turnover, up until top management sudden death, increases the negative effect of this organizational shock, supporting Hypothesis 3. Overall, this analysis illustrates that both the TMT and the employee composition significantly affect how firm performance responds to the disruptive shock of TM unexpected death.[10]

To control the robustness of my results, I reestimate the key models from the above analysis using the sales growth rate as the dependent variable (see Table 5). Overall, the sales growth models support the above conclusions. Models 1 to 4 in Table 5 find that top management unexpected death has a negative effect on sales growth. This negative effect decreases over time. However, significance is generally much weaker than before. This is also true for the other key explanatory variables. Thus, it is only the mitigating

[10]Recall that I restrict the analysis to only include unexpected deaths of top managers who are 70 years or younger. To control my results sensitivity to this age limit, I re-estimated all models in Tables 3 and 4, excluding individuals older than 55. This leaves a sample of 279 unexpected deaths in TMTs from 1995 to 2006. With the exceptions of Model 5, Table 3, and Model 3, Table 4, where the key explanatory variables are no longer significant, this control does not alter the conclusions from Tables 3 and 4. Results are available upon request.

effect of employee tenure that is significant within a 10 pct. signficance level. Table 5 indicates that *TM tenure*, *prev. TM turnover*, and *prev. employee turnover* also reduce the negative performance effect of TM unexpected death. These interactions effects are, however, not significant in the sales growth models. However, I argue that employment growth is overall a better indicator of firm performance than sales growth. First, I can observe the employment level over a longer period of time than sales. Second, the dataset miss several observations on firm sales. These gabs in the dataset makes it difficult to obtain continous measures of firms' sales growth. Finally, sales growth is generally a more spurious and volatile measure of firm performance than employment growth, making it more difficult to estimate.

– – – Insert Table 5 here – – –

Significance of past performance? Separate analysis for the treatment group

The above analysis successfully identified several factors that might help absorb the shock-effect of TM unexpected death, indicating that these firms will experience a relatively smaller negative effect on their post-event performance. One interesting conclusion from the above analysis is that TMT stability reduces the negative effect of top management unexpected death, as reflected by a mitigating effect from TMT tenure. However, even though the empirical analysis exploits exogenous variation in firm performance to investigate which firm characteristics influence post-shock performance, the conclusions might still be subject to endogeneity issues. This is due to a potential correlation between TMT tenure and firm performance. TMT tenure might increase performance, but performance might also increase TMT tenure (Wiersema and Bantel, 1993).[11] In other words, the conclusion that TMT tenure and employee tenure allow the firms to better handle disruptive shocks, increasing post-shock performance, might not apply equally to all firms regardless of their past performance. In this section, I therefore test if the stabilizing effect of the TMT and employee composition is contingent on the treatment group's past performance.

In Tables 6 and 7, I estimate additional firm-fixed effects models of employment growth excluding all firms but the treatment group. I divide the treatment group into three categories by their performance until the event (three-year employment growth rate). The first category, "Negative growth", is all firms with an average growth rate < 0. The second category, "Low growth", ranges from 0% to 7.57% employment growth. The third category, "High growth", has annual average growth rates equal to or exceeding

[11] The above estimations partly account for this, controlling for past performance (employment growth rates three years before the event). In addition, I use firm fixed effects and additional controls for firm heterogeneity.

7.57%, corresponding to the 75th percentile. This approach allows for direct testing of how top management unexpected death affects firm performance contingent on the firms' performance level until the event. I also test how the hypotheses vary with different performance levels at the time of death. Estimations are based on 1,615 firm year-observations for category 1, 1,958 firm year-observations for category 2, and 1,152 firm-year observations for category 3. The reduced number of observations restricts me from including all of the previous controls. Table 6 and 7 show the results.

Table 6 tests Hypothesis 2, investigating the effect of TMT tenure contingent on the firms' post-event performance. First, the models show that the negative effect of TM unexpected death is no longer significant for firms with negative growth. This result is consistent with Boyne et al. (2011), who find that TM succession only has negative effects for high-performing organizations. Similarly, the models confirm the mitigating effect of TMT tenure, but only for "High-growth" companies, partly supporting Hypothesis 2.

Table 7 tests Hypothesis 3, estimating the effect of employee tenure for the different growth categories. Table 7 finds that the negative performance effect of TM unexpected death is insignificant for firms with negative growth rates. Moreover, employee tenure only increases post-event employment growth in firms with high growth rates up until the event.

Finally, the lower number of degrees of freedom in this analysis makes it subject to greater uncertainty. In particular, one should exercise caution when making conclusions based on a lack of significance. Nevertheless, the models paint an interesting picture. First, in line with Boyne et al. (2011), I find that the negative effect of top management unexpected death is contigent on post-event performance. Thus, the effect is insignificant for companies with negative growth and strongest for the companies with the highest growth rates. Second, this analysis also adds to the previous findings. I find that the effect of destabilizing shocks to the TMT does not just depend on firm performance, it also varies with organizational stability. Hence, high-growth firms with higher average tenure among top managers and/or higher employee tenure, cope better with the exogenous organizastional shock of TM unexpected death. This suggest that retaining organizational stability when growing is important, as it reduces the vulnerability to unexpected changes in the TMT and, perhaps, other organizational disruptions.

Limitations

I recognize that the effect of top managers' unexpected deaths differ with their firm-specific values. I partly account for this by controlling for TMT salary, and tenure. However, other managerial characteristics, including charisma, brand value and networking skills, are non-observable. Similarly, while occupational codes allow me to identify the TMT, I do not know the division for which each manager is responsible. Furthermore,

I do not know the broader role each manager has in the organization, for example, if he/she is a role model to other managers and whether he/she dictates the management style or is the main innovator in the organization. The significance of different managerial styles, capabilities, and personal attributes might have different effects within heterogeneous organizations; the performance-effects of losing a leader are likely to differ with firm characteristics such as turnover, size and the number of top managers in the TMT. However, performance might also differ with other non-observable characteristics. The data at hand restricts me from investigating this possibility empirically and in more detail; thus, I shall leave these questions for further research. Because TM unexpected death draws randomly from the population of top managers and firms, I argue that these unobservable factors do not affect the empirical results.

While this study focuses on observable firm characteristics at the time of the exogenous event, I emphasize that the subsequent actions of heterogeneous firms also play an important role. Firms have different capabilities and strategies for handling this organizational disruption, including different replacement strategies. Moreover, these differences influence the performance effects of TM unexpected death. As argued above, a potential successor might apply a reversing effect on post-shock performance. He/she might renew and strengthen the firm's competences, potentially increasing the long-term post-shock performance. Conversely, as illustrated above, top management turnover is a potentially long and troublesome process. Furthermore, different successors have different incentives to initiate potentially disruptive organizational changes, so the type of successor matters to post-shock performance (Shen and Canella, 2002; Perry et al., 2011; Quigley and Hambrick, 2012). For example, Shen and Canella (2002) argue that outsiders and internal contenders are more likely to make significant organizational changes, while followers would continue the course of his/her predecessor. The replacement choice might be influenced by the number of qualified candidates in the labor market, particularly within the firm. This strategy is influenced by the firms' previous performance, and the board of directors', the CEO's, and other parties' willingness to adopt and request new ways. Firms might use follower succession to reduce organizational disruptions after top management succession. However, the situation sometimes calls for different perspectives and strategic changes. When performance is low, the replacement strategy might aim for someone to chart a different course (Shen and Canella, 2002; Karaevli, 2007). While acknowledging the potential reversing effects of a subsequent replacement and the significance of different firms' actions and strategies after TM unexpected death, I leave this topic for future research.[12] Moreover, Karaevli (2007) argues that controlling for the environmental context and firm performance, top management outsiderness does

[12]The IDA database provides some variables that might shed light on some of these questions. However, as this discussion illustrates, investigating a potential replacement effect with the data at hand, is subject to potential endogeneity problems, even when it is triggered by an exogenous event.

not affect post-succession performance.

Discussion

The above results indicate that firms, to some extent, can build organizations that are better prepared to handle and resist the negative shock-effect of TM unexpected death. First, I find that TMT tenure reduces the shock-effect. However, striving to increase TMT tenure might be a two-edged strategy. If TMT stability and continuity strengthen the organizational ability to resist the disruptive organizational shock, it might seem a reasonable assumption that increasing TMT tenure exposes the company to organizational disruptions, including executive migration, succession or death. Supporting this argument, recall that top management human capital is increasingly firm-specific. Moreover, human capital, particularly firm-specific human capital, increases with tenure, potentially enhancing the expected negative effect of top management turnover (Hannan and Freeman, 1984; Kesner and Sebora, 1994; Eriksen, 2011). If organizations prepare themselves for losing a leader by increasing TMT tenure, they might actually put themselves at greater risk! This hypothesis is crucial, as it questions TMT stability as an appropriate method for preparing the organization for disruptive organizational shocks. However, I argue that increasing top management tenure is not necessarily associated with greater vulnerability to disruptive shocks from the TMT, building on the organizational ecology and institutionalization (or routinization) literature (Hannan and Freeman, 1984; Conger, 1999). The top managers' values and strategic decisions might transfer to organizational culture and routines concurrent with his/her increasing tenure. When efficiently embedded in organizational routines, the organization might be able to continue the same activity pattern and strive for the same goals, independent of individual actors. Following similar lines of reasoning, TMT stability might transfer to the organization. In addition to the above regressions, which focus on the top management *team*, I investigate this hypothesis, estimating the significance of the deceased top manager's characteristics. I find that the negative effect of the unexpected death decreases with the deceased top manager's tenure with the firm, thus supporting this argument.[13]

Above, I make the perhaps counterintuitive proposition that the disruptive effect of TM unexpected death might decrease with the deceased top manager's tenure at the firm. The previous discussion on top management turnover might offer another explanation to support this. New top managers might have greater incentives to initiate organizational changes, for example, a different management style, introducing new strategies and markets, and restructuring the organization, thus signaling a different and improved course. As argued above, establishing new efficient organizational routines takes

[13]Results are available upon request.

time. However, if the initiator leaves the organization before such routines are efficiently integrated or a new culture is truly embedded into the organization, he/she might leave the organization in transition at a somewhat chaotic state, potentially leaving the organization with no clear guidelines for the collective purpose, organizational structures, or norms to use. Therefore, the disruptive effect of TM unexpected death might be smaller if the deceased top manager has longer tenure, despite potentially greater firm-specific human capital.

A key issue concerning *whether* or *when* the above results apply is the question of how industry differences come into play, for example, stable vs. instable industries and market concentration. Recall that organizational ecologists argue that selection favors stable and more efficient organizations when the context is stable, while more flexible and adaptive organizations perform better in unstable environments. Operating in an instable environment, i.e, placing demands on organizational adaptability and flexibility by employing excess resources, might improve organizational ability to adapt to sudden changes in the TMT composition. The proposition that TMT tenure increases stability and reduces the negative shock-effect and appertaining response time might not apply to instable environments. This might occur if organizational inertia, governed by high-tenured managers, restricts the organization from initiating or even perceiving the necessary course of action to adapt to the new context (Wiersema and Bantel, 1993; Tushman and Rosenkopf, 1996). Similarly, Le Mens et al. (2011) suggest that companies with stronger inertia might experience a gradual organizational capability depletion, lacking behind competitors in the market, because inertia stands in the way of crucial organizational change and improvement. Conversely, if environmental instability prevails for long periods of time, one might argue that companies adjust accordingly and develop organizational routines suitable for this context, for example, developing procedures for handling increased competition, shifting technologies and markets (Nelson and Winter, 1982). I see no obvious reasons why TMT continuity should prevent such routinized adaptability from continuing after TM unexpected death. Contradicting the above arguments, stable organizations might also be better prepared to handle TM unexpected death in both instable and highly competitive industries. Based on this discussion, it is not obvious how external factors such as industry stability and competition affect and potentially negate the results. It is not evident whether increasing TMT stability and continuity generally prepare firms to better deal with disruptive organizational shocks or whether this only applies to some subpopulations, for example, within stable industries.

Conclusion

Unexpected death in the TMT triggers a disruptive shock in a firm. This event implies a sudden drop in the firm's human capital stock, and it temporarily incapacitates organiza-

tional structures and routines. This study confirms a negative effect on firms' post-shock performance. The questions examined in this paper are whether firms' can prepare for such disruptive events and which firm characteristics reduce or eliminate this shock-effect. An immediate answer to the latter might be flexibility and adaptability; organizations that develop flexible routines and an adaptive capacity and have experience with organizational change might be better equipped for unexpected organizational disruptions. The opposites are thus highly routinized and inert organizations. Because organizational inertias might circumscribe the firms' willingness and ability to act and adapt to the new situation, there may be greater and potentially fatal effects on the organizations' post-shock performance. However, my findings support an alternative hypothesis.

I find that TMT and employee tenure reduce the negative effect of TM unexpected death, thus increasing post-event performance. Similarly, I show that past TMT and employee turnover hamper post-shock performance. Applying an organization ecology theory perspective, I explain these findings, arguing that increasing TMT and employee tenure reflect greater organizational stability. I argue that the mitigating effect of tenure on TM unexpected death is due to the following: i) stronger organizational routines and increased efficiency, and/or ii) greater organizational inertia, thus decreasing potentially disruptive post-event organizational changes. These findings suggest that top management and employee stability play a great role for efficient and routinized organizational behaviour, highly influencing overall organizational stability and thus the ability to resist disruptive organizational shocks. However, the data does not allow me to conclusively determine which of the above mechanisms play the greater role in driving this effect.

This study investigates the significance of different firm characteristics on the performance effect of one specific organizational shock, TM unexpected death. However, I argue that the firm characteristics, which this study identifies as those that help firms prepare for this disruptive event, also apply to other organizational shocks. I suspect that this is particularly true for other internal shocks, for example, executive or top employee migration. Some external shocks, for example, demand shocks, conversely, might call for reorganization and focus shift. Stable efficient organizational routines, particularly inertia, might stand in the way of accomplishing such necessary organizational changes or perceiving the need to do so. Similarly, the paper's conclusions are not directly transferable to deliberate organizational changes, for example, changes initiated to improve performance. This is especially true if greater resistance to change, i.e., stronger inertia, drives the above results. These propositions might even lead to reverse effects on post-change performance. I leave this question for future research to investigate.

Finally, the main conclusion from this study implies that organizations can benefit from increasing their focus on retention strategies. These strategies might include the terms of notice, non-competition agreements or employee shares. This study also

has political implications, as the law restricts using some of these strategies. If top management and employee retention increase efficiency and strengthens organizations' resilience to unexpected disruptive shocks, it could be politically desirable to expand the use of, for example, non-competition agreements.

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Tables

Table 1: Descriptive statistics (1995-2006)

	No TM dies		**Before TM death**		**After TM death**	
	Mean Number	Std. Dev.	Mean Number	Std. Dev.	Mean Number	Std. Dev.
Employment growth, t	0.36	(23.84)	2.40	(19.07)	-3.00	(23.59)
Employment growth, t-1	4.12	(25.15)	3.45	(19.54)	-0.96	(21.91)
TM Death	0	(0)	0	(0)	1	(0)
Ln(time since death), t	0	(0)	0	(0)	1.31	(0.63)
TMT turnover, t	32.96	(64.26)	45.18	(62.19)	58.32	(69.99)
Employees, t	43.07	(134.47)	248.61	(906.90)	226.05	(833.33)
Ln(employees), t	3.14	(0.89)	4.06	(1.42)	4.03	(1.46)
Firm age, t	12.60	(7.19)	14.09	(6.41)	17.04	(6.69)
Ln(firm age), t	2.31	(0.74)	2.49	(0.62)	2.72	(0.54)
No. TMs, t	1.89	(5.87)	9.51	(21.22)	9.65	(42.11)
Ln(no. TMs), t	0.42	(0.70)	1.34	(1.19)	1.15	(1.25)
No. workplaces, t	1.62	(4.47)	4.38	(15.90)	3.97	(17.26)
Ln(no. workplaces), t	0.20	(0.51)	0.55	(0.98)	0.56	(0.92)
Ln(TMT salary), t	13.20	(0.40)	13.19	(0.36)	13.23	(0.38)
TMT tenure, t	5.63	(6.69)	8.29	(5.61)	6.64	(6.18)
Employee tenure, t	4.75	(2.83)	4.98	(2.52)	5.50	(2.64)
Emp growth, t-3 to t	6.27	(22.01)	4.41	(15.49)	0.10	(13.86)

Notes. Descriptive statistics from observations included in Table 5

Table 2: Comparison of treatment and control groups (1997-2006)

	No TM dies		**Before TM death**		**After TM death**	
	Mean Number	Std. Dev.	Mean Number	Std. Dev.	Mean Number	Std. Dev.
Sales growth, %	**2.14**†	(32.07)	**3.42**	(27.32)	**-0.62****	(32.25)
Sales, deflated	69,664**	(304,053)	430,104	(1,802,205)	528,994	(3,514,104)
No. of TMs	1.89**	(5.87)	9.52	(21.22)	9.65	(42.11)
Observations	116,776		1,683		2,512	
Firms	20,525		411		584	
	No TM dies		**Before TM death**		**After TM death**	
	Mean Number	Std. Dev.	Mean Number	Std. Dev.	Mean Number	Std. Dev.
Employment growth, %	**0.90****	(26.88)	**3.40**	(20.53)	**-2.98****	(30.84)
Employees	44.23**	(166.01)	247.46	(912.42)	275.34	(1,070.60)
Observations	144,570		2,386		2,975	
Firms	22,964		550		649	

The upper part of the table includes observations from Table 5, and the lower part includes observations from Tables 3 and 4. Significance levels: † : 10% * : 5% ** : 1%
Column 1 + 2: T-test of H0: Mean(No death) - Mean(Before death)=0, Ha: diff < 0
Column 2 + 3: T-test of H0: Mean(Before death) - Mean(After death)=0, Ha: diff > 0

Table 3: Employment growth (1995-2006)

	(1)	**(2)**	**(3)**	**(4)**	**(5)**
TM Death	-4.981**	-1.430	-11.155**	-11.207**	-5.232**
	(1.039)	(3.473)	(1.641)	(1.648)	(1.703)
Ln(Time since death, yrs)	6.001**	5.978**	6.076**	6.077**	6.361**
	(0.712)	(0.712)	(0.712)	(0.712)	(0.712)
Employment growth, t-1	-0.263**	-0.263**	-0.263**	-0.263**	-0.263**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Ln(employees), t	38.747**	38.747**	38.755**	38.755**	38.813**
	(0.179)	(0.179)	(0.179)	(0.179)	(0.179)
Ln(firm age), t	-18.385**	-18.396**	-18.379**	-18.379**	-18.400**
	(0.221)	(0.221)	(0.221)	(0.221)	(0.221)
Ln(no. TMs), t	-2.864**	-2.863**	-2.863**	-2.863**	-2.848**
	(0.161)	(0.161)	(0.161)	(0.161)	(0.161)
Ln(no. workplaces), t	-6.182**	-6.181**	-6.181**	-6.180**	-6.141**
	(0.316)	(0.316)	(0.316)	(0.316)	(0.316)
Ln(TMT salery), t (2000=100)	-1.960**	-1.959**	-1.957**	-1.957**	-1.945**
	(0.225)	(0.225)	(0.225)	(0.225)	(0.225)
TMT turnover, t (pct)	-0.021**	-0.021**	-0.021**	-0.021**	-0.021**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
TMT tenure, t (yrs)	-0.108**	-0.108**	-0.106**	-0.106**	-0.106**
	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)
Employee tenure, t (yrs)	-1.220**	-1.220**	-1.222**	-1.222**	-1.222**
	(0.050)	(0.050)	(0.050)	(0.050)	(0.050)
TM death x Ln(firm age), death-year		-1.374			
		(1.283)			
TM death x TMT tenure, death-year			0.673**	0.622**	0.327*
			(0.139)	(0.204)	(0.141)
TM death x Tenure of deceased TM				0.049	
				(0.144)	
TM death x pre emp growth, death-year					-0.881**
					(0.068)
Constant	-37.492**	-37.489**	-37.563**	-37.568**	-37.917**
	(3.118)	(3.118)	(3.118)	(3.118)	(3.116)
Industry (6 dummies)	Yes	Yes	Yes	Yes	Yes
Log-likelihood	-656169	-656169	-656155	-656155	-656056
Observations	149931	149931	149931	149931	149931

Notes. All regressions are fixed effects models, and the dependent variable is:
yearly employment growth rate in percent. Standard errors are reported in parentheses.
† $p< 0.10$; * $p< 0.05$; ** 0.01.

Table 4: Employment growth (1995-2006)

	(1)	**(2)**	**(3)**	**(4)**
TM Death	-18.231**	-7.917**	-3.571**	2.777
	(1.907)	(2.113)	(1.274)	(1.779)
Ln(Time since death, yrs)	6.250**	6.405**	5.953**	5.937**
	(0.713)	(0.712)	(0.713)	(0.712)
Employment growth, t-1	-0.263**	-0.263**	-0.263**	-0.263**
	(0.002)	(0.002)	(0.002)	(0.002)
Ln(employees), t	38.776**	38.817**	38.745**	38.492**
	(0.179)	(0.179)	(0.179)	(0.185)
Ln(firm age), t	-18.373**	-18.397**	-18.384**	-18.262**
	(0.221)	(0.221)	(0.221)	(0.222)
Ln(no. TMs), t	-2.859**	-2.848**	-2.860**	-2.876**
	(0.161)	(0.161)	(0.161)	(0.161)
Ln(no. workplaces), t	-6.166**	-6.137**	-6.180**	-6.111**
	(0.316)	(0.316)	(0.316)	(0.316)
Ln(TMT salery), t (2000=100)	-1.964**	-1.948**	-1.958**	-1.959**
	(0.225)	(0.225)	(0.225)	(0.225)
TMT turnover, t (pct)	-0.021**	-0.021**	-0.021**	-0.021**
	(0.001)	(0.001)	(0.001)	(0.001)
TMT tenure, t (yrs)	-0.106**	-0.107**	-0.108**	-0.112**
	(0.017)	(0.017)	(0.017)	(0.017)
Employee tenure, t (yrs)	-1.223**	-1.222**	-1.221**	-1.290**
	(0.050)	(0.050)	(0.050)	(0.051)
TM death x Employee tenure, death-year	2.619**	1.086**		
	(0.316)	(0.344)		
TM death x pre emp growth, death-year		-0.821**		
		(0.073)		
TM death x pre TMT turnover, death-year			-0.032†	
			(0.017)	
Emp turnover, t (pct)				-0.014**
				(0.003)
TM death x pre emp turnover, death-year				-0.203**
				(0.038)
Constant	-37.571**	-37.889**	-37.510**	-35.983**
	(3.117)	(3.116)	(3.118)	(3.132)
Industry (6 dummies)	Yes	Yes	Yes	Yes
Log-likelihood	-656129	-656053	-656167	-656137
Observations	149931	149931	149931	149931

Notes. All regressions are fixed effects models, and the dependent variable is:
yearly employment growth rate in percent. Standard errors are reported in parentheses.
† $p< 0.10$; * $p< 0.05$; ** 0.01.

Table 5: Sales growth (1997-2006)

	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
TM Death	-4.924*	-2.605	-8.735**	-8.470*	-2.662	1.309
	(2.045)	(5.176)	(3.201)	(3.728)	(2.469)	(3.477)
Ln(Time since death, yrs)	2.422†	2.413†	2.438†	2.454†	2.332	2.315
	(1.443)	(1.443)	(1.443)	(1.443)	(1.444)	(1.443)
Ln(firm age), t	-6.003**	-6.010**	-6.000**	-6.001**	-6.005**	-5.343**
	(0.300)	(0.301)	(0.300)	(0.300)	(0.300)	(0.305)
Sales growth, t (pct)	-0.310**	-0.310**	-0.310**	-0.310**	-0.310**	-0.305**
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Ln(employees), t	-20.859**	-20.857**	-20.855**	-20.855**	-20.858**	-20.655**
	(0.360)	(0.360)	(0.360)	(0.360)	(0.360)	(0.360)
No. TMs, t	0.095**	0.095**	0.096**	0.097**	0.098**	0.092**
	(0.032)	(0.032)	(0.032)	(0.032)	(0.032)	(0.032)
Ln(no. workplaces), t	4.468**	4.469**	4.464**	4.467**	4.469**	4.358**
	(0.596)	(0.596)	(0.596)	(0.596)	(0.596)	(0.595)
Ln(TMT salery), t (2000=100)	-1.433**	-1.433**	-1.430**	-1.431**	-1.430**	-1.455**
	(0.413)	(0.413)	(0.413)	(0.413)	(0.413)	(0.413)
TMT turnover, t (pct)	-0.009**	-0.009**	-0.009**	-0.009**	-0.009**	-0.006**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
TMT tenure, t (yrs)	0.066*	0.066*	0.067*	0.066*	0.066*	0.055†
	(0.031)	(0.031)	(0.031)	(0.031)	(0.031)	(0.031)
Employee tenure, t (yrs)	-0.930**	-0.929**	-0.931**	-0.930**	-0.931**	-1.279**
	(0.094)	(0.094)	(0.094)	(0.094)	(0.094)	(0.099)
TM death x Ln(firm age)		-0.949				
		(1.946)				
TM death x TMT tenure			0.423			
			(0.273)			
TM death x Employee tenure				0.715		
				(0.629)		
TM death x pre TMT turnover					-0.055	
					(0.034)	
Emp turnover, t (pct)						-0.053**
						(0.004)
TM death x pre emp turnover						-0.164*
						(0.075)
Constant	104.394**	104.396**	104.342**	104.346**	104.343**	106.728**
	(5.726)	(5.726)	(5.726)	(5.726)	(5.726)	(5.726)
Industry (6 dummies)	Yes	Yes	Yes	Yes	Yes	Yes
Log-likelihood	-579813	-579813	-579811	-579812	-579811	-579724
Observations	121154	121154	121154	121154	121154	121154

Notes. All regressions are fixed effects models, and the dependent variable is: yearly sales growth rate in percent. Standard errors are reported in parentheses.
† $p< 0.10$; * $p< 0.05$; ** 0.01.

Table 6: Employment growth (1997-2006) – Fixed effects

	(Negative growth)	**(Low growth)**	**(High growth)**
TM Death	-0.112	-4.541†	-18.202**
	(3.565)	(2.748)	(4.110)
Ln(Time since death, yrs)	1.567	0.623	6.882**
	(1.682)	(1.389)	(2.148)
Employment growth, t-1	-0.208**	-0.332**	-0.221**
	(0.027)	(0.022)	(0.028)
Ln(sales), t	2.388**	8.914**	7.051**
	(0.589)	(1.002)	(1.320)
Ln(firm age), t	-8.416*	-4.208	-15.566**
	(3.515)	(3.002)	(4.596)
TMT tenure, t (yrs)	0.303†	0.082	0.062
	(0.161)	(0.121)	(0.239)
Employee tenure, t (yrs)	-2.691**	-3.699**	-5.531**
	(0.459)	(0.472)	(0.866)
TM death x TMT tenure	-0.017	0.089	0.775†
	(0.288)	(0.218)	(0.428)
Constant	3.967	-66.727**	-10.753
	(10.313)	(12.974)	(16.757)
Observations	1615	1958	1152
Log-likelihood	-7201	-8500	-5235

Notes. All regressions are fixed effects models. The dependent variable is employment growth$_t$. Firms are categorized by the their average yearly employment growth rate three years prior to the event. *Negative growth* < 0 %; *Low growth* 0 % to 7.57 %; *High growth* ≥ 7.57 %.
The cut-off point 7.57 is the 75th percentile.
† $p< 0.10$; * $p< 0.05$; ** 0.01. Standard errors are reported in parentheses.

Table 7: Employment growth (1997-2006) – Fixed effects

	(Negative growth)	**(Low growth)**	**(High growth)**
TM Death	-1.143	-6.696†	-23.784**
	(4.270)	(3.425)	(4.981)
Ln(Time since death, yrs)	1.562	0.604	7.110**
	(1.681)	(1.389)	(2.138)
Employment growth, t-1	-0.208**	-0.332**	-0.221**
	(0.027)	(0.022)	(0.028)
Ln(sales), t	2.393**	8.885**	7.397**
	(0.590)	(0.998)	(1.324)
Ln(firm age), t	-8.295*	-4.125	-15.130**
	(3.524)	(3.002)	(4.590)
TMT tenure, t (yrs)	0.307†	0.087	0.063
	(0.158)	(0.120)	(0.238)
Employee tenure, t (yrs)	-2.704**	-3.688**	-5.599**
	(0.460)	(0.471)	(0.863)
TM death x Employee tenure	0.141	0.588	3.206**
	(0.604)	(0.573)	(1.199)
Constant	3.701	-66.662**	-15.726
	(10.333)	(12.930)	(16.901)
Observations	1615	1958	1152
Log-likelihood	-7201	-8499	-5233

Notes. All regressions are fixed effects models. The dependent variable is employment growth$_t$. Firms are categorized by the their average yearly employment growth rate three years prior to the event. *Negative growth* < 0 %; *Low growth* 0 % to 7.57 %; *High growth* ≥ 7.57 %.
The cut-off point 7.57 is the 75th percentile.
† $p< 0.10$; * $p< 0.05$; ** 0.01. Standard errors are reported in parentheses.