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CEO Succession, Gender and Risk Taking

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CEO Succession, Gender, and Risk-Taking

Abstract

Purpose - The purpose of this paper is to examine, within a succession framework, the impact of the gender composition of Boards of Directors on the gender of the CEOs they appoint, and to assess the impact of newly appointed CEOs’ gender on risk-taking by the firm.

Design/methodology - We estimate a two stage least squares regression using data on 679 CEO successions in North American firms.

Findings - The results show that successor CEOs are more likely to be female the greater the percentage of females on the Board, regardless of other succession characteristics such as whether the new CEO is from inside or outside the firm. Furthermore, a change in CEO from male to female is associated with a decrease in several measures of firm risk taking.

Limitations – The sample is restricted to relatively large, exchange-traded North American firms and may not generalize to other groups.

Practical Implications – The findings suggest that women aspiring to CEO positions and firms wishing to promote women should monitor Board composition to ensure female representation. Other steps that the firm may take to promote women to this position (such as looking outside the firm) have an insignificant impact when Board composition is taken into account.

Originality/value – The findings are novel and inform CEO succession research by demonstrating which succession process characteristics work to increase females’ chances and which have no effect. Female CEOs are likely to provide leadership that reduces the risk profile of the firm.

Keywords CEO succession, CEO gender, corporate risk-taking

Paper Type Research paper
CEO Succession, Gender, and Risk-Taking

Women comprise a disproportionately small percentage of CEO positions (Brady et al., 2011; Orser and Leck, 2010; Hansen et al., 2010). Although one may debate appropriate definitions of career success (Orser and Leck, 2010; O’Leary, 1997), we instead use a CEO-succession framework to investigate factors that may help women succeed men as corporate CEOs. We also address the question of risk-taking by female CEOs. The relation between gender and risk-taking is an empirical issue, but the two have often been thought of as linked (Sheaffer et al., 2011; Maxfield et al., 2010; Beckmann and Menkoff, 2008). Some of these studies involve risk taking as revealed by questionnaires, simulations or experiments (Maxfield et al., 2010). Studies using these approaches leave unanswered the question of whether male or female CEOs take on more risk in actual corporations. In addition, there are studies of actual risk taking in allocation of pension funds (Bajtelsmit et al., 1999), and gambling, investment and insurance decisions (Barber and Odean, 2001; Schubert et al., 1999). These studies find women more risk averse and/or less overconfident than men. However, Bliss and Potter (2002) find female mutual fund managers take on marginally more risk and Atkinson et al. (2003) find no significant difference in risks of male and female managed mutual funds. Beckmann and Menkhoff (2008) find female fund managers slightly more risk averse. Welsch and Young (1984) find no difference between male and female entrepreneurs and Iqbal et al. (2006) find male executives more risk averse than females in their handling of stock option awards. In short, the findings on gender and risk-taking are mixed. Adams et al. (2009) show that women are appointed to CEO positions when the firm is in a relatively good financial state, but they do not examine whether the new female CEOs take steps to change the risk profile of the firm after
appointment. In this paper we examine how the risk profile of the firm changes after appointment of the new CEO. The risk measure in Adams et al. (2009) is risk as perceived by the stock market. We instead look at risk in terms of measures over which the new CEO has more control.

Often risk taking is viewed positively (Tucker, 2006; Kleiman, 1992). However, in the wake of the 2008 global financial crisis, excessive risk-taking has received much blame and risk aversion is viewed more favourably (Power, 2009; Economist Intelligence Unit, 2009; Mortgenson, 2008; Syed, 2008). CEO successions provide the ideal opportunity to identify the impact of gender on risk-taking in corporations by examining actual corporate outcomes when the gender of the CEO changes through succession.

In summary, this paper addresses the need identified by Brady et al. (2011, p. 85) “for further research on how organizational characteristics and processes influence the presence of female executives in large corporations.” This article addresses that need by employing a CEO-succession framework and provides outcome-based evidence on female CEOs’ impact on corporate risk-taking.

The CEO Succession framework

There is a substantial body of literature regarding CEO succession beginning with Zajac and Westphal (1996) (Elsaid and Davidson, 2009; Davidson et al., 2008; Worrell et al., 1997). In this literature, two main types of explanatory variables are used to model the CEO succession process with regression analysis. One group of explanatory variables relates to the similarity of the CEO candidates to the members of the Board of Directors. This approach is derived from Tajfel and Turner’s (1986) social identity theory of intergroup behaviour. Under this theory, the Board of Directors is a group that may display in-group bias by giving preferential treatment to
those they perceive as similar. If the Board is comprised mainly of men, they will prefer a male as the successor CEO. Furthermore, under social identity theory, leaders are close to the prototypical group member. If the group (Board) is mostly male, they will view another male as the most suitable to play a leadership (successor CEO) role. Zajac and Westphal (1996) find that boards appoint a demographically similar CEO. The demographic similarity measures that Zajac and Westphal (1996) investigate are age, functional background, and educational background.

For our study of gender and CEO succession, we redefine the usual dependent variable of succession studies to indicate whether a change in gender of the CEO occurs upon succession, and include as a demographic similarity explanatory variable a measure of the gender makeup of the Board of Directors. Matsa and Miller (2011) examine whether the presence of women on the Boards leads to the appointment of more women in senior management positions in the firm. By using a succession framework, we are able to incorporate additional factors and see if, for example, recruiting outside the firm increases the chance of a female being hired as CEO given a certain percentage of women on the board.

Other models also suggest groups such as Boards of Directors will hire candidates similar to themselves. For example, there has been considerable previous research on the concept of similarity-attraction that covers both the management and organizational behaviour literature (e.g., Goldberg, 2005; Smith, 1998; Tsui & O’Reilly, 1989) and the psychology literature (e.g., Moreno & Flowerday, 2006; Michinov & Monteil, 2002; Jackson et al., 1991). Schneider (1987) developed the attraction-selection-attrition model which suggests that firms evolved towards interpersonal homogeneity. Ployhart et al. (2006) support a multilevel interpretation of the attraction-selection-attrition model. Pfeffer (1983) developed the organizational demography model which suggests that the firm’s demographic composition such as gender, age, religion and
socioeconomic position influences not only individual behaviour but also the actions of the firm. Both the attraction-selection-attrition and the organizational demography models indicate that people are attracted to firms whose members are like them, and, likewise, firms seek to attract similar members and screen out dissimilar people. Harrison et al. (1998) define social integration as “the degree to which group members are psychologically linked ... with one another in pursuit of a common objective.” They find that surface diversity is important in CEO succession since the hiring of a CEO by a board is often the beginning of the relationship between the CEO and the board.

Beyond similarity of CEO candidates to members of the Board, the other explanatory variables used in the CEO succession literature comprise variables which have been demonstrated to be significant to CEO choice in prior empirical studies. Examples include the profitability of the firm (Carter et al., 2003), the possible existence of a “designated heir” CEO (when the firm has a succession plan) (Shen and Cannella, 2003), the choice between inside versus outside successors (Naveen, 2006), and whether the succession is forced or voluntary (Parrino, 1997).

In addition to the question of demographic similarity in CEO successions, we also investigate the impact of successor CEO demographics on corporate risk taking. CEO successions offer a unique opportunity to study the impact of CEO characteristics on risk-taking, because most characteristics related to risk, such as the riskiness of the firm’s operations, the competitive situation, and the firm size all remain fixed around the CEO succession and the only major change is in who is filling the CEO position.

In summary, we draw on the literature on similarity-attraction and organizational demography to develop a hypothesis regarding the importance of women on the board to
selecting a female CEO. We also draw on the literature on gender and risk taking to develop a hypothesis about how newly appointed female CEOs might alter the risk profile of the firm.

**Methods**

As in previous CEO succession studies, we use regression analysis. Based on the similarity-attraction and organizational demography literature and Matsa and Miller (2011), we propose:

**Hypothesis 1:** Changes in CEO gender from male to female arising from succession are a positive function of the change in the percentage of females on the board (and vice versa).

Although results on gender and risk taking were mixed, the majority of the studies noted in the literature review (Schubert *et al.*, 1999; Barber and Odean, 2001; Eckel & Grossman, 2002; Beckmann & Menkhoff, 2008) above indicate that women tend to be more risk-averse than men. Based on this we propose:

**Hypothesis 2:** The change in riskiness of a corporation following CEO succession is a negative function of the change in CEO from male to female.

We recognize the endogeneity of risk taking and CEO gender: While CEO gender may affect corporate risk taking, as hypothesized in hypothesis 2, it may also be true that firms with particular risk profiles are more inclined to choose specific genders of CEO and boards. An example is the “glass cliff” phenomenon raised by Ryan and Haslam, 2007. The “glass cliff” phenomenon states that females are overrepresented in precarious leadership positions. Similarly, there may be endogenous effects that make firms that choose female CEOs also more likely to
hire female dominated boards, as in hypothesis 1. Because such endogeneity can cause bias in ordinary least squares (OLS) regression, we employ two stage least squares regression (2SLS).

For stage 1 of hypotheses 1 and 2 we use the following instrumental variable to model the change in the percentage of women on the board: the percentage of female board members on Fortune 500 companies in the year of succession (using data from Catalyst surveys and Peterson and Philpot, 2007). This variable meets the requirements of instrumental variables in that it is related to the choice of CEO but not related to the error term. In tables 2 and 3 we show the findings for the 2SLS regressions. We include dummy variables to represent the year of the CEO succession to capture the trend that firms increasingly choose female CEOs over the sample period.

Data sources and variable definitions

We form our sample by searching Standard and Poor’s Execucomp database for CEO successions. Execucomp contains data about top executives and their compensation for large, small and mid cap North American firms. We exclude financial firms (SIC 6020-6799), consistent with Alexander (2006) and others who find that corporate governance in financial institutions is very different than in non-financial firms. Between 1992 and 2005 we find 758 CEO successions. We use these firms’ proxy statements to obtain data such as the number of female directors on the board and whether the successor CEO is an insider or outsider. We obtain financial statement information from Compustat. We exclude all successions where board membership does not change from before to after succession. We do this to avoid having the measure of change in board gender composition act as simply a proxy for board stability. This reduces our sample size to 679 CEO successions in 650 firms.
The dependent variable in Hypothesis 1 is a dummy variable with a value of 1 if, through succession, the firm’s CEO changes from a male to a female, zero otherwise. We test it by estimating an equation with limited dependent variable regression due to the binary nature of the dependent variable (Maddala, 1983; Aldrich & Nelson, 1984). In a separate regression, we look at situations where the CEO changes from female to male using a dependent variable set equal to 1.

The dependent variable in hypothesis 2 is the change in the risk profile of the firm from pre to post CEO succession. We look at change in risk over three periods relative to the succession, which we can think of as occurring in year “0”. The three periods we examine are year -1 to year +1; year -3 to year +3 and year -5 to year +5. All three periods produce similar results, although the year -1 to year +1 findings are somewhat less significant, perhaps because new CEOs do not have time to effectively implement their plans over this short horizon. We present the year -3 to year +3 findings in the tables of this paper because this time period is attrition free. Due to attrition, the sample size significantly declines if we expand the time period to year -5 to year +5. We use changes in the following measures of corporate riskiness commonly found in the literature: financial leverage (as in Haugen and Senbet, 1981; Smith and Watts, 1982 and 1992; and Nam et al., 2003), research and development expense as a percent of sales (as in Nam et al., 2003), and cash holdings as a percent of total assets (as in Guney et al., 2007) – this is actually a measure of risk aversion, so we expect the opposite sign. We also use the degree of operating leverage as a measure of firm riskiness as well as the standard deviation of cash flows adjusted for sector average standard deviation (as in John et al., 2008). Consistent with Chan et al. (2001), only about 40% of firms report research and development expenditures, reducing our sample size for this measure. The sample size is also reduced when we use the standard
deviation of cash flows measure of risk, but because our initial sample is large, we still obtain significant results when using these variables.

The principal independent variables are as follows: the change in the percentage of females on the board of directors (hypothesis 1) and the change in the gender of the CEO (hypothesis 2). The change in the percentage of females on the Board is examined rather than just the number of females on the Board because CEO successions are often accompanied by substantial changes in the make-up of the Board as successor CEOs arrange to have members included on the Board (Hermalin and Weisbach, 2003). We exclude the female CEO when we count the number of female directors on the board following succession. This is done to avoid inducing a relationship between the presence of a woman CEO and the percentage of women on the board. These data are obtained from proxy statements.

To control for other factors which may influence the hypothesized relationships, we include the following control variables (as suggested by CEO succession theory) in each equation:

i) Firm size: To control for possible size-related heteroscedasticity and because large and small firms may behave differently, we include a variable representing firm size. We measure this variable as the natural logarithm of the aggregate of the firm’s total assets from years -3 to -1 relative to CEO succession. When the dependent variable is change in cash as a percentage of total assets, we use sales instead of total assets, due to possible multicollinearity.

ii) Profitability: As in Carter et al. (2003) we include return on assets (ROA) as a control variable in our regression equations. We create an industry adjusted ROA measure (Barber and Lyon, 1996) for each firm for years -3 to -1 relative to
succession. We computed the industry adjusted ROA by subtracting the firm’s average industry ROA (using four digit SIC codes where possible and three digit SIC codes when there are not at least three other firms in the same four digit SIC code) from each individual firm’s ROA. We obtain data for this measure from Compustat.

iii) Forced versus voluntary succession: To determine the type of succession, we examine Wall Street Journal Index (WSJI) and the Wall Street Journal (WSJ) for the reasons for the successions. From the news stories, we classify forced successions as all CEO successions other than those arising from retirement, death, illness, or those involving the CEO’s departure for a better and more prestigious position in another firm. As in Parrino (1997), we consider retirements of CEOs before the age of 60 to be forced retirements. We code the variable as a 1 for forced turnover and 0 otherwise.

iv) Designated heir: Some firms have formal succession plans (Behn et al. 2005; Shen and Cannella, 2003). We use the approaches in Vancil (1987), Kesner and Sebora (1994), Zhang and Rajagopalan (2006) and Dalton and Kesner (1983) to determine if our sample firms have a succession plan. The existence of such plans obviously impacts CEO succession, so we include a dummy variable with a value of 1 when there is an heir apparent as defined in Shen and Cannella, zero otherwise.

v) Inside versus outside successor: If the board hires a CEO from inside the firm, we classify this as an inside successor and code the dummy variable as 1 for this case. We code outsiders as a 0. Consistent with Naveen (2006) we consider
CEOs who have been with the firm less than one year to be outsiders. However, to remove interim CEOs from the sample, we discard observations for CEOs with a tenure of 1.5 years or less in the CEO position.

vi) Dummy variables representing the year of succession are included to capture the fact the percentage of women in top management positions has increased over time. For ease of presentation, we do not show their estimated coefficients in the tables.

When testing the hypothesis concerning risk taking (hypothesis 2) we include two additional control variables as follows:

vii) A variable “CEO horizon” to reflect the possibility (Dechow and Sloan, 1991) that CEOs with short expected careers due to imminent retirement may reduce R&D expenditures to improve near term earnings reports. We calculate this variable as 65 less the age of the new CEO, which we obtain from Execucomp. When the CEO is older than 65, we use zero for this variable. Sixty five is the usual retirement age for CEOs (Wright et al., 2007).

viii) Change in CEO’s “pay at risk” over the succession period: We measure pay at risk as the proportion of bonuses, restricted stock grants and option grants (excluding reloads) to total compensation less bonuses, restricted stock and option grants, using data from Execucomp (Elsaid and Davidson, 2009). Firms use such incentive compensation to manage managerial risk taking and align the interests of managers and shareholders (Beatty and Zajac, 1994; Ryan and Wiggins, 2002, Yermack, 1997; Yermack and Ofek, 2000). In our study of managerial risk taking, we thought it important to control for firms’ attempts to manage this variable.
Results

Table 1 presents descriptive statistics for variables used in the analysis. We removed observations with minimum and/or maximum changes of 100%, as these likely involve outliers. The sample descriptive statistics confirm that women average less than 10% of CEO positions. They also show the strong influence of inside successors (mean = 74%) and designated heirs (mean = 50%) in CEO successions, and the relative rarity of forced successions (6%).

Table 2 contains the 2SLS limited dependent variable regression estimates of the relation between a change in CEO gender and the change in the percentage of female directors on the board. In the results the estimated coefficient of the change in percentage of female directors is significant regardless of whether the CEO changes from male to female or female to male. The sign of the estimated coefficient is as predicted in hypothesis 1, that is, a change to a female CEO is associated with more female directors and a change to a male CEO is associated with fewer female directors.

Table 3 presents the 2SLS estimates of the relation between changes in various risk measures for the firm and a change to a female CEO. In the results one variable is significant in 80% of the ways in which risk is measured. That variable is the change from a male to a female CEO, as predicted in hypothesis 2. In all cases, the sign of the relation is as predicted, i.e., the change to a female CEO is accompanied by less risk. Most of the control variables are not significant, but profitability (measured as industry adjusted ROA) is significant for two measures.
of risk (% Change in R&D Expense and Change in Cash Holdings) and firm size (measured as natural log of total assets) is significant for two measures of risk (% Change in R&D Expense and % Change Leverage). The White-Koenker statistics given in the last line of the Tables 2 and 3 show that all of our regressions are free of heteroscedasticity (Baum et al., 2003).

**Discussion, Implications, and Conclusion**

Regression analysis shows that gender-related variables (change in CEO gender, change in percentage of women on the Board) are important in determining the risk profiles of corporations (hypothesis 2) and the likelihood that women will be chosen as CEO (hypothesis 1) respectively. Of perhaps equal interest are the findings that very few of the other variables found significant in other CEO succession research are significant in our study, testifying to the importance of the gender-related variables (Matsa and Miller, 2011) in predicting the gender of the new CEO (hypothesis 1) and risk profile of the firm (hypothesis 2). In particular, firm size, profitability (Barbar & Lyon, 1996; Carter et al., 2003) the presence of a designated heir (Behn et al., 2005; Shen and Cannella, 2003), whether the successor CEO was from inside or outside the firm (Naveen, 2006) and whether the outgoing CEO was forced to resign (Parrino, 1997) did not impact women as successor CEOs when female Board membership was taken into account in contrast to their significance in the studies mentioned. The insignificance of other variables suggests that without women on the Board, other measures aimed at promoting women to the CEO position are not effective. For example, despite observations such as Ibarra and Hansen’s (2009) that women are twice as likely as men to be appointed from outside the company our results suggest that without sufficient representation of women on the Board, even a policy of outside promotion is unlikely to result in more female CEOs.
In terms of gender and risk-taking (examined in general in Sheaffer et al., 2011; Maxfield et al., 2010; Beckmann and Menkoff, 2008), the only factor analyzed in our study of risk taking by newly appointed female CEOs, that rivals gender for statistical significance is profitability (measured as industry adjusted ROA). It is reasonable to expect that firms consider their degree of profitability when establishing the risk profile of the firm. It is noteworthy that even pay-at-risk (bonuses, option grants, etc.) found significant in general studies of CEO succession (Yermack & Ofek, 2000; Ryan & Wiggins, 2002; Elsaid & Davidson, 2009) did not have a significant impact on risk-taking when the switch to a female CEO is taken into account.

Our contribution has been to add gender variables to models of CEO succession and firm risk taking. The statistical significance of these variables has implications for several groups: First, future researchers should consider gender when modelling CEO succession. Future researchers should focus on “how to break” the demographic similarity barrier in promotions, leadership appointments and compensation. On the other hand, the insignificance of the profitability measure in our results seems to refute the “glass cliff” phenomenon, since Ryan and Haslam (2007) primarily identify perilous positions as ones in which firm performance has been deteriorating. Adam et al. (2009) also suggest that there appears to be no “glass cliff” facing female CEOs in the US. Further research on this topic may be warranted.

The paper’s practical implications are as follows: women who aspire to CEO status should monitor the gender composition of the Board of Directors of their firm or of firms where they are contemplating employment, as female representation on the Board is a significant determinant of female succession to the CEO position. Firms wishing to promote women to top executive positions should likewise monitor Board composition to ensure significant female representation. Matsa and Miller (2011) argue that “public policies aimed at increasing female
representation on boards of directors, such as the quota recently adopted in Norway, may lead to general spillovers in management.” There is a feedback cycle effect in this case where the presence of more females CEOs increases the pool of potential female board members which in turn further increases the number of female CEOs. We show that other steps that firms may take to try to promote women (for example, recruiting from outside the firm) are unlikely to have a significant impact on the likelihood of appointing a female CEO.

Finally, the findings provide new insight into the direction successor female CEOs take their firms with respect to concrete measures of corporate risk taking (hypothesis 2). The direction is toward lower levels of riskiness. Corporate boards seeking cautious leadership would do well to consider female CEOs. This finding could be helpful in influencing public attitudes to be more accepting of female CEOs and more females in top management and boards of directors.

Limitations

The sample is limited to North American firms. Cultural differences may imply that the findings do not generalize to other regions. Furthermore, the reliance on the Compustat database means that sample firms are all stock exchange-listed and therefore are more likely to be larger firms. The findings may not generalize to small or privately held firms.
Table 1: Descriptive Statistics

<table>
<thead>
<tr>
<th>Dependent Variables:</th>
<th>N</th>
<th>Median</th>
<th>Mean</th>
<th>Maximum</th>
<th>Minimum</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypothesis 1:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male-to-Female CEO Dummy</td>
<td>679</td>
<td>0.000</td>
<td>0.073</td>
<td>1.000</td>
<td>0.000</td>
<td>0.260</td>
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<tr>
<td>Female-to-Male CEO Dummy</td>
<td>679</td>
<td>0.000</td>
<td>0.022</td>
<td>1.000</td>
<td>0.000</td>
<td>0.146</td>
</tr>
<tr>
<td>Hypothesis 2:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Change in R&amp;D Expense</td>
<td>309</td>
<td>0.031</td>
<td>0.075</td>
<td>1.442</td>
<td>-0.862</td>
<td>0.327</td>
</tr>
<tr>
<td>Change in Cash Holdings</td>
<td>659</td>
<td>0.003</td>
<td>0.015</td>
<td>0.976</td>
<td>-0.383</td>
<td>0.077</td>
</tr>
<tr>
<td>% Change in Leverage</td>
<td>637</td>
<td>0.021</td>
<td>0.677</td>
<td>296.190</td>
<td>-0.982</td>
<td>11.906</td>
</tr>
<tr>
<td>Change in Operating Leverage</td>
<td>556</td>
<td>-0.254</td>
<td>3.088</td>
<td>273.584</td>
<td>-252.418</td>
<td>46.733</td>
</tr>
<tr>
<td>Std. Dev. Of Cash Flows</td>
<td>309</td>
<td>0.023</td>
<td>0.599</td>
<td>43.566</td>
<td>0.001</td>
<td>4.787</td>
</tr>
<tr>
<td>Explanatory Variables:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Female Directors (t=+1)</td>
<td>661</td>
<td>0.083</td>
<td>0.088</td>
<td>0.75</td>
<td>0.000</td>
<td>0.102</td>
</tr>
<tr>
<td>% Female Directors (t=-1)</td>
<td>661</td>
<td>0.063</td>
<td>0.076</td>
<td>0.60</td>
<td>0.000</td>
<td>0.096</td>
</tr>
<tr>
<td>Change in % Female Directors</td>
<td>661</td>
<td>0.000</td>
<td>0.012</td>
<td>0.40</td>
<td>-0.33</td>
<td>0.059</td>
</tr>
<tr>
<td>Forced Turnover</td>
<td>679</td>
<td>0.000</td>
<td>0.063</td>
<td>1.000</td>
<td>0.000</td>
<td>0.244</td>
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<td>Insider Successor</td>
<td>679</td>
<td>1.000</td>
<td>0.741</td>
<td>1.000</td>
<td>0.000</td>
<td>0.439</td>
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<td>Designated Heir</td>
<td>679</td>
<td>0.000</td>
<td>0.495</td>
<td>1.000</td>
<td>0.000</td>
<td>0.500</td>
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<tr>
<td>Ind. Adj. ROA (t=-3to-1)</td>
<td>667</td>
<td>7.146</td>
<td>13.560</td>
<td>351.434</td>
<td>-226.800</td>
<td>29.390</td>
</tr>
<tr>
<td>Ln Total Assets (t=-3to-1)</td>
<td>668</td>
<td>6.785</td>
<td>6.986</td>
<td>12.126</td>
<td>2.393</td>
<td>1.627</td>
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<tr>
<td>Ln Sales (t=-3to-1)</td>
<td>671</td>
<td>6.969</td>
<td>6.966</td>
<td>11.53</td>
<td>1.43</td>
<td>1.571</td>
</tr>
<tr>
<td>% Female Directorships in Fortune 500 Firms</td>
<td>665</td>
<td>10.200</td>
<td>9.926</td>
<td>14.700</td>
<td>8.300</td>
<td>0.990</td>
</tr>
</tbody>
</table>
Table 2: 2SLS Estimates for Hypothesis 1: Change in CEO gender from male to female is a positive function of the change in percentage of females on the board and vice versa. (t statistics in brackets)

<table>
<thead>
<tr>
<th></th>
<th>Male-to-Female CEO</th>
<th>Female-to-Male CEO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.018</td>
<td>0.059</td>
</tr>
<tr>
<td></td>
<td>(0.384)</td>
<td>(1.429)</td>
</tr>
<tr>
<td>Change in % Female Directors</td>
<td>0.099</td>
<td>-0.242</td>
</tr>
<tr>
<td></td>
<td>(2.231)*</td>
<td>(-6.149)**</td>
</tr>
<tr>
<td>Ind. Adj. ROA</td>
<td>0.0001</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>(0.677)</td>
<td>(1.147)</td>
</tr>
<tr>
<td>Ln Total Assets</td>
<td>-0.004</td>
<td>-0.010</td>
</tr>
<tr>
<td></td>
<td>(-1.730)†</td>
<td>(-4.469)***</td>
</tr>
<tr>
<td>Designated Heir</td>
<td>-0.009</td>
<td>-0.003</td>
</tr>
<tr>
<td></td>
<td>(-0.950)</td>
<td>(-0.367)</td>
</tr>
<tr>
<td>Insider Successor</td>
<td>0.016</td>
<td>-0.000</td>
</tr>
<tr>
<td></td>
<td>(1.491)</td>
<td>(-0.028)</td>
</tr>
<tr>
<td>Forced Turnover</td>
<td>-0.012</td>
<td>-0.021</td>
</tr>
<tr>
<td></td>
<td>(-0.735)</td>
<td>(-1.415)</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>0.2%</td>
<td>5.4%</td>
</tr>
<tr>
<td></td>
<td>(0.911)</td>
<td>(3.790)***</td>
</tr>
<tr>
<td>N</td>
<td>661</td>
<td>661</td>
</tr>
<tr>
<td>White-Koenker</td>
<td>15.208</td>
<td>19.892</td>
</tr>
</tbody>
</table>

*** Significant at 0.001, ** Significant at 0.01, * Significant at 0.05, † Significant at 0.10
**Table 3:** 2SLS Estimates for Hypothesis 2: Change in risk is a negative function of change in CEO from male to female (t statistics in brackets)

<table>
<thead>
<tr>
<th></th>
<th>% Change in R&amp;D Expense</th>
<th>Change in Cash Holdings</th>
<th>% Change Leverage</th>
<th>Change in operating leverage</th>
<th>Std Deviation of Cash Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>17.355 (1.105)</td>
<td>-0.011 (-0.346)</td>
<td>5.703</td>
<td>-2.923 (-0.103)</td>
<td>1.362 (0.428)</td>
</tr>
<tr>
<td>Male→ Female CEO</td>
<td>-15.424 (-2.123)*</td>
<td>0.078 (2.663)**</td>
<td>-1.309</td>
<td>-13.605 (-1.747)†</td>
<td>-9.727 (-4.151)***</td>
</tr>
<tr>
<td>Ind. Adj. ROA</td>
<td>0.332 (3.446)***</td>
<td>0.000 (3.131)**</td>
<td>-0.033</td>
<td>0.121 (1.318)</td>
<td>0.005 (0.470)</td>
</tr>
<tr>
<td>Ln Total Assets</td>
<td>-3.201 (-1.772)†</td>
<td>-- (-2.375)*</td>
<td>-0.883</td>
<td>-0.542 (-0.368)</td>
<td>-0.126 (-0.669)</td>
</tr>
<tr>
<td>Ln Sales</td>
<td>--</td>
<td>0.001 (0.928)</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Designated Heir</td>
<td>7.683 (0.985)</td>
<td>0.003 (0.474)</td>
<td>1.155</td>
<td>-7.853 (-1.326)</td>
<td>-1.150 (-1.589)</td>
</tr>
<tr>
<td>Insider Successor</td>
<td>-2.699 (-0.302)</td>
<td>0.002 (0.301)</td>
<td>-0.544</td>
<td>0.581 (0.086)</td>
<td>1.133 (1.284)</td>
</tr>
<tr>
<td>Forced Turnover</td>
<td>-4.754 (-0.367)</td>
<td>-0.011 (-1.023)</td>
<td>-0.166</td>
<td>5.712 (0.560)</td>
<td>-0.289 (-0.228)</td>
</tr>
<tr>
<td>New CEO Horizon</td>
<td>-0.170 (-0.283)</td>
<td>0.000 (0.240)</td>
<td>0.109</td>
<td>0.686 (1.608)</td>
<td>-0.006 (-0.124)</td>
</tr>
<tr>
<td>Change in Pay at Risk</td>
<td>0.015 (0.030)</td>
<td>-0.001 (-1.106)</td>
<td>-0.002</td>
<td>-0.356 (-0.819)</td>
<td>-0.015 (-0.306)</td>
</tr>
<tr>
<td>Adjusted $R^2$ (F)</td>
<td>4.9% (2.414)*</td>
<td>1.8% (1.613)†</td>
<td>0.3%</td>
<td>1% (1.186)</td>
<td>8.1% (2.416)**</td>
</tr>
<tr>
<td>N</td>
<td>309</td>
<td>566</td>
<td>566</td>
<td>556</td>
<td>309</td>
</tr>
</tbody>
</table>

*** Significant at 0.001, ** Significant at 0.01, * Significant at 0.05, † Significant at 0.10
References


