THE EFFECT OF CEO POLITICAL IDEOLOGY ON EXECUTIVE SUCCESSION FOLLOWING FIRM MISCONDUCT

by

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(Under the Direction of John R. Busenbark)

ABSTRACT

When a firm experiences a negative event, the board often changes the firm's CEO to constrain negative reactions. Although research enriched in examining incoming CEOs' characteristics, little is known about the crisis itself that incurs the board's inclination to the attributes. This study examines how different natures of infractions affect the selection of CEOs with specific political orientations. More precisely, I hypothesize that a board is more likely to appoint conservative CEOs following competence failures and liberal CEOs after integrity violations. I also hypothesize that outside evaluators will positively perceive the congruence between the nature of the crisis and the political orientation of the incoming CEO. These hypotheses are tested using a two-stage treatment effects model to correct for the potential endogeneity induced by omitted variables. Accordingly, this study contributes to the management literature by examining the antecedents that lead to the selection of CEOs with certain attributes.

INDEX WORDS: CEO succession, firm crisis, CEO political ideology, two-stage treatment effects model, endogeneity

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TABLE OF CONTENTS

Page

LIST OF TABLES

Page

LIST OF FIGURES

Page

INTRODUCTION

Following a firm crisis, executive turnover is one of the most prominent actions that the board of directors can take (Friedman *et al.,* 1989). The board attempts to lessen the damage to the firm's legitimacy by dismissing the incumbent CEO so that it can distance the organization from the executive's bad influences (Arthaud-Day *et al.,* 2006; Suchman, 1995). The board then hires a new CEO. By selecting an executive with certain highly favorable attributes to external evaluators, the board can send signals to outside observers about the values it cherishes (Gomulya *et al.*, 2014; Wiersema *et al.*, 2018).

Although an ample amount research has highlighted the distinguishable characteristics of an incoming CEO that influence his or her selection by the board (Gomulya *et al.*, 2014; Huson *et al.*, 2001; Shen *et al.*, 2002a, 2002b), less attention has been given to the crisis itself, which has caused not only the executive turnover but also the board's inclination towards specific CEO characteristics. This is an important omission in the literature, as recent works in impression management emphasize the role of a crisis-specific response strategy in effectively lessening the stakeholders' negative perceptions of the organization (Bundy *et al.,* 2015).

This study examines how the different natures of dismissal may prompt a specific CEO selection in order to assuage negative reactions. To address this problem, I theorize that the nature of the violation that the focal firm has undergone may navigate the board's decision-making process on selecting a certain type of CEO over others. In particular, I use a theory from the impression management literature to underscore that directors

choose CEOs who would be viewed by outside evaluators as a practical and symbolic solution to the foregone crisis; through choosing such a CEO, the firm can convey the strategic direction it is headed toward and communicate its determination to distant itself from the past negative events (Arthaud-Day *et al.*, 2006). The theory argues that the restoration would be effective when the adopted remedy is tailored to match the crisis attribution, and the selection process would entail the board's consideration about responding to certain crisis category (Coombs, 1995; Coombs *et al.*, 2004).

In particular, I integrate research on how an executive's political ideology extends to the strategic decisions of a firm (Chin *et al.*, 2013; Christensen *et al.*, 2015; Gupta *et al.*, 2017b), which in turn is perceived by the external stakeholders. I posit that directors tend to select more conservative CEOs after a competence failure and more liberal CEOs after an integrity violation. Since conservative CEOs have been suggested to take more responsibility in financial issues, the board would likely choose one to improve competence-related outcomes. Following integrity violations, the board would likely select a liberal CEO who engages in ethical and politically correct initiatives to amend integrity problems. Additionally, I suggest that matching crises to response strategies would be effective in provoking positive perceptions of evaluators based on the impression management theory.

I test the hypotheses on a sample of 282 CEO turnovers from S&P 1500 firms that occurred between 2008 and 2012. The hypotheses are tested using a two-stage treatment effects model to account for a potential endogeneity problem in the primary explanatory variable. Although not all the hypotheses were supported, one of the instruments has proved to be significant.

This paper contributes to the CEO succession literature by examining specific mechanisms that directors undertake when appointing a new executive. It also enhances the study of firm misconduct using the perspective of integrity-based and competence-based dimensions to analyze firm failures and the corresponding different firm behaviors. The framework delineates the contingency in which firms respond differently. Finally, this research adds to the research on CEO political ideology by demonstrating the differences in conservative and liberal CEOs.

THEORY AND HYPOTHESIS

To examine the contingencies of a board's decision on finding a new CEO following firm failure, this study builds upon theories in impression management, trust, and CEO political ideology. Research on impression management helps identify key factors that the board considers when selecting a new CEO after firm failure, as the theory argues that responding with cause-specific remedies can minimize the negative perceptions that failure causes (Bundy *et al.*, 2015; Coombs, 1995). Trust theory is useful in examining the cause of failure, as it addresses two aspects of trust impair – competence and integrity – that categorize the causes of failure in general (Kim *et al.*, 2006). Studies in CEO political ideology demonstrate the major differences in personal attributions and organizational decisions that conservative and liberal managers have (Chin *et al.*, 2013), the board can take these differences into account as remedies to specific cause of failure.

When a firm is engaged with negative events, one of the most pivotal consequences is the loss of social approval from the outside stakeholders (Kahn *et al.*, 2013; Love *et al.*, 2009; Rhee *et al.*, 2006). Due to the detrimental effect that stakeholder's negative perceptions have on a firm's long-term growth and performance, the board must constrain these negative reactions and promote positive perceptions (Gomulya *et al.*, 2014). Research on impression management has shown that the crisis-response match to be an effective way to achieve such a goal. By matching a specific type of response strategy that is accommodated to the evaluator's crisis attributions, firms can effectively limit the negative reactions of evaluators (Bundy *et al.*, 2015; Coombs,

1995; Coombs *et al.*, 2004). Based on the premise, it can be expected that the board seeks to select a CEO whose appointment represents a remedy to an extant problem by successfully matching the crisis attribution and in turn, minimizing the negative consequences.

Nature of Failure

To understand the nature of the firm crisis, I address the two-folded categorization of infraction from the literature on trust: competence failure and integrity violation (Connelly *et al.*, 2016; Kim *et al.*, 2006). Scholars have identified that the two different kinds of infraction provoke evaluators to develop different schemas to interpret information (Weick, 1995), evaluate the information (Gioia *et al.*, 1996; Thomas *et al.*, 1993), and set different expectations on actions of the responsible party (Janowicz-Panjaitan *et al.*, 2009; Tomlinson *et al.*, 2009). Consequently, the difference in infractions results in the differential effectiveness between response strategies.

The first aspect, competence-related infraction, refers to the failure of possessing the technical and interpersonal skills required for a job (Kim *et al.*, 2006). Competence failures can be understood as a lack of managerial proficiency without embodying ill intension. Examples in firm crisis settings may include bankruptcy, product recalls, disagreement between the CEO and stakeholders, and continued low performance. In the wake of competence failures, the board would be concerned about securing quality outcomes. Thus, to effectively solve the competence issue, the board would be more inclined to hire CEO whose focus is on financial performance or on managerial diligence.

The second aspect, integrity-related infraction, refers to the violation of adhering to a set of principles that is considered acceptable (Connelly *et al.*, 2016). Integrity

violations are commonly ill-intended and perceived as unethical. Examples in business context can include accounting irregularity, federal investigation, litigation, or a CEO's personal misdemeanor. At the onset of integrity violation, the board would emphasize seizing the unethical behavior. Accordingly, it would be apt to identify and invite CEOs who potentially bring about an ethical image, such as socially just or a politically correct one, to the firm.

CEO Political Ideology

To understand the CEO aspect as a response to crisis, I have drawn on research on CEO's political ideology. The dimension of an individual's political ideology, especially the bilateral spectrum of conservatism–liberalism, presents the most compelling and predictive approach to understanding personal belief systems (Jost *et al.*, 2009; Poole *et al.*, 1984; Schwartz, 1996). Scholars in political science have demonstrated that individuals with certain type of political ideology share similar views on a wide range of issues – such as social justice, egalitarianism, free market, or individualism (Detomasi, 2008; Jost *et al.*, 2003; Schwartz, 1996; Tetlock, 2000) – and that the two ends of the continuum are distinct in their views (Schwartz, 1996). Recent advances in management research on the effect of political ideology in CEO context further highlight how executives holding either of the two discrete ideologies manifest different strategic decisions and shape contrasting organizational outcomes (Briscoe *et al.*, 2017; Chin *et al.*, 2013; Christensen *et al.*, 2015; Gupta *et al.*, 2017b). Since these political ideologies have such differencing consequences, it can be expected that the board would choose a CEO, and his or her political ideology, according to the aforementioned nature of crisis.

Extant research has demonstrated some of the characteristics that conservative CEOs have in common. For one, conservative CEOs are different from liberal CEOs in that they prefer more risk-averse strategic decisions. Christensen *et al.* (2015) found that conservative managers engage in less tax avoidance then liberal executives. Hutton *et al.* (2014) also supports the positive relationship between political conservatism and risk-aversion behaviors, including lower debt, lower R&D expenditures, and less risky investments. Another notable manifestation of managerial conservatism is organizational outcomes, as conservative managers tend to attribute the outcomes to person-based factors (Weiner *et al.*, 2011; Zucker *et al.*, 1993), which, then reinforces the managers' belief in their capability and responsibility to elevate performances.

Evidence suggests that politically liberal CEOs hold distinct views that drive certain choices and organizational outcomes. Compared to conservative managers, liberal CEOs are oriented toward political correctness, or "doing the right thing." They allocate more resources to corporate social responsibility initiatives (Chin *et al.*, 2013), and pursue egalitarianism in compensation among executives (Chin *et al.*, 2017) as well as in resource allocation between different business units (Gupta *et al.*, 2018). Liberals also lean toward to making external attributions in evaluating outcomes (Carroll *et al.*, 1987; Skitka *et al.*, 1992). Instead of seeing the relationship between efforts and performances in a causal way, they tend to understand the cause to be random or to come from exogenous shocks (Tetlock *et al.*, 2013).

Based on these premises, the board's appointment of a new CEO should differ according to the match between the nature of the crisis and the political ideologies of the CEOs. With this match, firms can respond to different natures of crisis with a specific

reactive impression management strategy, which can lead to a more effective restoration of stakeholder approval (Bundy *et al.*, 2015; Claeys *et al.*, 2014; Mishina *et al.*, 2012). Accordingly, I hypothesize that after competence-related failures, a firm would select politically conservative CEO who fears losses and values financial security and who is more averse to uncertainty (Jost, 2006). Through such a choice, a firm signals its emphasis on performance. Conversely, if a firm commits integrity-related misconducts, it would appoint a politically liberal CEO who cherishes moral values, such as economic equality, social justice, and market controls (Jost, 2006), and who engages in politically correct decisions (Briscoe *et al.*, 2017; Gupta *et al.*, 2017a); here, the firm signals its awareness of the integrity issue and acts to prevent future ones.

(H1) After CEO dismissal due to a violation, there is a positive relationship between a competence violation and the likelihood the board selects a conservative CEO.

In addition to the CEO selection process, the impression management literature suggests a positive relationship between the crisis-response match and outside perceptions. Bundy *et al.* (2015) theorized that the loss of social approval is minimized when the organization's response strategy matches the evaluator's attributions of crisis responsibility. Based on this proposition, I adopted the concept of conformity to the CEO selection process. I hypothesize that outside stakeholders would positively perceive the board's selection of a CEO with certain political ideologies corresponding to the nature of crisis. In examining the relationship of conformity, I chose the analyst group to represent the general investors, as it provides professional evaluations based on knowledge and experience, which, in turn, sets a benchmark for other participants in the capital market.

(H2) There is a positive relationship between the congruence of CEO selection and violation type and security analyst recommendations.

METHODOLOGY

Sample

The sample for this study is the firms that were listed on the S&P 1500 between January 1, 2008, and January 1, 2013. I chose 2008 as the start of the observation period because this captures the 2008 United States presidential election, which followed the presidential primaries by each political party. I captured all CEO successions that occurred during the target period. The data for CEO succession and CEO-level controls were collected from Execucomp. Firm and industry level control variables were collected from Compustat. Data related to the board of directors were collected from Institutional Shareholder Services, whereas analyst data were collected from the Institutional Brokers' Estimate System. Media coverage for CEO dismissal was gathered from Factiva.

Within the target period, 1,275 CEO successions were identified based on Execucomp data. News reports with information to infer the reason for succession were found for 895 of the events; out of these successions, 613 resulted from reasons other than firm failures. These included CEO's health issues, transitions to another firm, M&A, and interim CEOs. The final sample consists of 282 CEO dismissals — 237 competence failures and 45 integrity violations.

Response Variables

New CEO's political ideology. The new CEO's political ideology is gauged based on his or her CEO political ideology score, as suggested by Chin *et al.* (2013). The score is calculated from CEO's personal contributions to political organizations. The U.S.

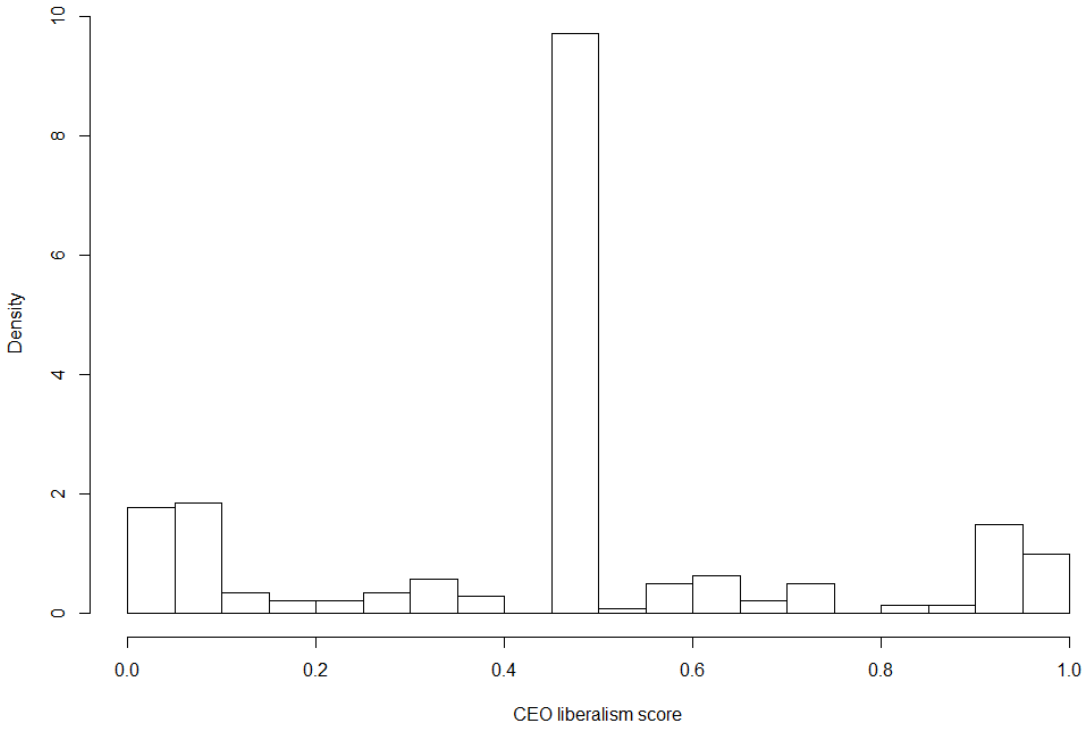
Federal Election Commission stores information about individual contributions worth more than $200; this information includes the contributor name, occupation, contribution amount and year of the contribution, and the recipient's name and political affiliation. Despite the criticism that CEOs' political donations are motivated by reasons other than their political beliefs, such as a desire for influence or the interests of a firm, the political science literature has well established that individuals' contributions are overwhelmingly motivated by personal ideology and should not be viewed as investments (Ansolabehere *et al.*, 2003; Ensley, 2009; Francia, 2003; Francia *et al.*, 2005).

I collected the contributions data from 1997 to 2010, which is a long enough timeframe to contain major election events – including nationwide presidential elections and congressional election cycles – and for meaningful patterns in the contribution behavior to become clear (Chin *et al.*, 2013). Each CEO's contributions were identified using the CEO's name and previous occupations to exclude irrelevant individuals whose names happened to be similar to the target CEO. The identified contribution data were then used to calculate four ratios, the mean of which equals political ideology index: (1) the number of contributions to Democratic recipients divided by the number of contributions to Democratic and Republican recipients; (2) the dollar amount of contributions to Democratic recipients divided by the dollar amount of contributions to Democratic and Republican recipients; (3) the number of distinct years the contributor made donations to Democratic recipients divided by the number of years donations were made to Democratic and Republican recipients; (4) the number of distinct Democratic recipients divided by the number of distinct recipients affiliated with both parties. To account for missing values, the default constant of 0.1 and 0.2 were added to nominators

and denominators, respectively. The resulting index lies between 0 and 1; an index close to 0 represents a more conservative CEO, and an index close to 1 indicates a more liberal CEO. Thus, scores larger than 0.5 were given a value of 1 to indicate a liberal CEO, scores smaller than 0.5 were given a value of 0 to indicate conservative CEO. Some observations have a score of exactly 0.5, representing a perfectly neutral orientation. These middle values were mostly observed from missing values, where no contribution data could be found. From the reviews of party alignment and polarization behavior in the American public, it is highly unlikely that executives are ideally unbiased (Carmines *et al.*, 2006; Layman *et al.*, 2006). Hence, half of the CEOs with a score of 0.5 were given 0 and the other half a score of 1, creating a dichotomous variable.

More and more management studies have adopted the donation-based liberalism score method developed by Chin *et al.* (2013). Briscoe *et al.* (2014) and Chin *et al.* (2017) gauged individual CEO's liberalism using the same method, whereas Gupta *et al.* (2017b) measured individual board members' conservatism based on the same approach. The method was extended to obtain a political orientation at the employee level (Gupta *et al.*, 2017a) or manager liberalism (Briscoe *et al.*, 2017). My approach is consistent in several ways with these prior studies. Figure 1 depicts a normally distributed sample, largely ranging between 0.01 and 0.99. Moreover, CEOs were leaning more toward conservatism with the mean score of 0.46, as expected from the prior studies (Chin *et al.*, 2013; Gupta *et al.*, 2017a).

Figure 1. Histogram of CEO liberalism



Analyst evaluations. Analyst reports are an important source of information for stock market participants; they have a large impact on market reactions (Frankel *et al.*, 2006; Lys *et al.*, 1990). The variable was collected from the Institutional Brokers' Estimate System and was measured as a count variable, which captures the total number of analysts who revise their recommendations upward for the firm within the one-month period following the appointment of a new CEO.

Explanatory Variables

Competence violation. Competence violation is an indicator variable for the nature of firm failure; a value of 1 is assigned if the failure arises from competence-related reasons, and a value of 0 is assigned if failure relates to integrity problems. For each CEO succession event, news coverage from major sources (*PR Newswire, Wall Street Journal, AP News, and Dow Jones Newswire*) was collected with a one-year range

preceding and following the succession. I reviewed each collection of media packets to infer the reason for the succession. In many cases, the actual reason was not explicitly stated in the news or press release but was expressed in such expressions as "to pursue other interest" or it was not even stated at all. Thus, I relied heavily on analyst comments, insider interviews, or journalist opinions, which were supplemented by inference from the coder. Examples of reasons for competence-related dismissals include bankruptcy, large product recall, wide service failure, disagreement with major shareholders, and sustained low-performance, whereas integrity-related dismissals include accounting fraud, SEC probes, litigation from consumers, and CEO misbehavior (Connelly *et al.*, 2018; Connelly *et al.*, 2016; Gangloff *et al.*, 2016; Schnatterly *et al.*, 2018).

Congruence. Congruence is a dichotomous variable, which indicates that the nature of firm failure and the incoming CEO's political ideology were matched. It is derived from hypothesis 1, which argues that firms appoint conservative CEOs after competence failure and liberal CEOs after integrity failure. In the sample, the congruence variable was valued as 1 if the hypothesized relationship was actually observed and 0 if it was not.

Control Variables

I controlled for several relevant factors that could predict the hypothesized relationships. The possibly confounding factors include CEO-level controls, firm-level controls, and investor-level controls. Adding to the controls listed below, year-level control was incorporated in the regression models by adding indicator variables for each year to isolate potential influences from macroeconomic environments. All control variables were lagged one-year unless noted otherwise.

CEO-level controls. Since the variable of interest for this study is a new CEO's political ideology, I controlled for the *political ideologies of outgoing CEOs*, which captures the potential that the board appoints the new CEO in reference to the ousted CEO's political liberalism, whether it be positively or negatively related. These ideologies were measured in the same way that I gauged those of incoming CEOs, but they were not assigned binary values. In addition, the regression model controlled for the CEO's gender. This indicator variable was valued as 1 if the incoming CEO was *female*.

Firm-level controls. Selecting a senior executive is closely related to the firm's characteristics. To control for the firm size, I included log-transformed total assets to the model. Return-on-asset ratio and debt-to-equity ratio control for firm profitability and risk-tolerance on leverage, respectively. HQ state is an indicator variable that a firm's headquarter is located in a Republican state. Headquarter locations that were not found in Compustat were searched and coded manually. The state political orientation was matched to the result of the 2016 presidential election, the most recent nationwide election.

Investor-level control. To control for the possibility that the firms received more attention to be positively assessed, I included the control variable of the number of analyst recommendations to the model. This variable is calculated as the total number of analyst recommendations within a one-year window surrounding CEO succession.

Analytical method

To test the hypotheses, I employed a two-stage treatment effects model to account for the possible endogeneity in the main explanatory variables (Bascle, 2008; Certo *et al.*, 2016; Lennox *et al.*, 2012; Semadeni *et al.*, 2014). Specifically, I was concerned about the potential of an omitted variable that is not included in my model influencing violation type and the political ideology of the incoming CEO at the same time. Although the ordinary least squares method is a frequently employed estimator in quantitative research, it requires a collection of assumptions about the true regression equation and the data generating process to ensure the best linear and unbiased estimates. One of the key assumptions is that the random component of the regression equation does not correlate with the explanatory variables (Gujarati, 2009; Neter *et al.*, 1996). Contrary to randomized experiments, which researchers can meticulously design to control for all the potential confounding factors, it is seldom feasible for quantitative social science studies utilizing archival data to apply estimators while naively presuming exogeneity. When a variable that influences both response variables and some explanatory variables is omitted from the regression equation, violation of the exogeneity assumption induces the estimates from ordinary least squares to not converge to the correct population parameters, even with the large sample sizes. The unbiasedness rises, as the estimates include not only the effect of measured predictors but also the unobserved effects that correlate with the predictors as well as predict the response variable (Greene, 2003). In this study, the concern about the omitted variable influencing the response variables and

the main explanatory variables motivated me to employ a two-stage treatment effects model that can correct the endogeneity issue (Heckman, 1979).

This model is one of the most widely used standard estimator in economics to retrieve consistent estimates under the threat of endogeneity. The model consists of two different equations. In the first stage, the probability of observing a positive outcome of the endogenous variable (X) is regressed on the instruments (Z) and the exogenous covariates (C) using the probit model while assuming a standard normal distribution for the random component. The inverse Mills ratio for each observation is calculated using the estimated parameters. The ratio is included in the second stage model as an additional explanatory variable. The ratio's coefficient appearing in the second stage equation equals the correlation between the random component in the first stage and the error terms in the second stage divided by the standard deviation of the error terms in the second stage. In other words, the coefficient represents the fraction of the covariance between the endogenous variable and the main response variable (Bascle, 2008; Baum *et al.*, 2006; Busenbark *et al.*, 2017; Larcker *et al.*, 2010; Tucker, 2010).

$$Y_i = \alpha + \beta X_i + \lambda \widehat{IMR}_i + \boldsymbol{c_i}'\boldsymbol{\delta} + \epsilon_i$$

Where

$$\widehat{IMR}_{\mathrm{i}} = \frac{\phi(\boldsymbol{z_i'}\widehat{\boldsymbol{\gamma}} + \boldsymbol{c_i'}\widehat{\boldsymbol{\eta}})}{\Phi(\boldsymbol{z_i'}\widehat{\boldsymbol{\gamma}} + \boldsymbol{c_i'}\widehat{\boldsymbol{\eta}})} \quad for \quad P(X_i = 1|\boldsymbol{z_i}, \boldsymbol{c_i}) = \Phi(\boldsymbol{z_i'\gamma} + \boldsymbol{c_i'\eta})$$

An instrumental variable, also referred to as exclusion restriction, is a new explanatory variable that appears in the first stage equation with two characteristics: relevance and exogeneity (Kennedy, 2003; Semadeni *et al.*, 2014). Instrument relevance refers to the requirement that an exclusion restriction is substantially correlated with the endogenous variable. Instrument exogeneity demands an exclusion restriction to be uncorrelated with the error process in the second stage equation. These two requirements

enable exclusion restrictions to successfully isolate the shared influence so that one can attain unbiased estimates. For both models, I included two instruments. The first exclusion restriction is the *proportion of independent directors* in the board. After Congress passed the Sarbanes-Oxley Act of 2002, major exchanges required firms to include a certain number of independent directors on the board of directors to improve monitoring role of the board on internal control and governance. Thus, firms with a high proportion of independent directors are more scrupulous about controlling the integrity-related violations. The second instrument, *CEO duality* refers to whether or not the dismissed CEO also sat as the chairman of the board. By assuming this role, a CEO can possess more power relative to the board, and the board's monitoring function may suffer, leading to increased likelihood of integrity-related violations.

Based on the preceding discussions on endogeneity, I employed a two-stage treatment effects probit model to test Hypothesis 1 and estimate the equation on the binary response variable, and the two-stage negative binomial model to test Hypothesis 2 to estimate the equation on the count response variable.

RESULTS

Table 1 displays the descriptive statistics and correlation for the main variables in this study. The mean of CEO liberalism index is less than 0.5 for both outgoing and incoming CEOs, meaning that CEOs in the sample are more conservative than liberal. This finding is consistent with prior literature that shows executives lean toward conservatism. Also, no combination of variables has a correlation exceeding 0.5. Given the weak correlations, I ruled out the potential of multicollinearity between explanatory variables.

Table 1. Descriptive Statistics and Correlations

Variables	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13
1 New CEO's liberalism	0.475	0.500	1												
2 Analyst evaluation	0.617	0.974	0.01	1											
3 Competence violation	0.840	0.367	-0.07	0.04	1										
4 Congruence	0.543	0.499	-0.68	-0.06	-0.01	1									
5 Old CEO's liberalism	0.446	0.284	0.16	0.01	-0.03	-0.23	1								
6 Total assets (ln)	8.005	2.162	-0.07	0.19	-0.08	0.08	-0.17	1							
7 ROA	0.306	3.039	-0.08	0.04	-0.20	-0.10	0.08	-0.10	1						
8 Debt-to-equity ratio	2.292	56.013	-0.08	0.09	0.01	0.07	-0.02	-0.06	0.00	1					
9 HQ location	0.415	0.494	-0.14	0.01	0.03	0.12	-0.18	-0.08	0.04	0.00	1				
10 Female CEO	0.035	0.185	-0.03	0.10	-0.02	-0.05	0.11	0.06	-0.02	-0.01	0.03	1			
11 # of analyst recommendations	100.770	105.354	0.05	0.27	-0.11	-0.03	-0.04	0.45	-0.08	0.00	-0.13	0.10	1		
12 Proportion of independent directors	0.794	0.111	-0.07	0.01	-0.10	0.09	0.03	0.13	-0.13	0.00	-0.16	-0.01	0.09	1	
13 CEO duality	0.720	0.450	0.04	0.09	0.05	-0.10	-0.02	0.15	0.03	0.02	0.01	0.03	0.21	-0.13	1

n = 282

Table 2 presents the analysis results for hypothesis 1, which predicts the new CEOs' political ideology with the endogenous explanatory variable – competence violation. Model 1 includes the result of the first-stage probit model, which predicts the probability of competence violation with exclusion restrictions and covariates. In the first stage, the variables of interest are exclusion restrictions. The first exclusion restriction, the proportion of independent directors, is a moderately strong predictor of competence

violation ($\hat{\gamma} = -1.521, p = 0.102$); the anticipated sign suggests a negative relationship between the independent directors and the competence violation. The second exclusion restriction, CEO duality, is moderately significant in explaining competence violation ($\hat{\gamma} = 0.239, p = 0.255$). In addition to the first-stage model results, I conducted tests to check for the appropriateness of exclusion restrictions. The results from likelihood ratio test for lack of fit of the two instruments ($\chi^2(2) = 4.42, p = 0.109$), combined with the partial pseudo-R^2 (0.02), indicate that the two exclusion restrictions are moderately significant in predicting the probability of competence failure, thus supporting the relevance requirement.

Model 2 includes the control variables and the correcting term – the inverse Mills ratio – which was obtained from the parameter estimates from Model 1. Model 3 shows the results from the full model. The main explanatory variable of interest, competence violation, is added to the control equation. Although it is true that the primary explanatory variable has a marginal significance at the 0.05 level ($\hat{\beta} = -0.352, p = 0.120$), this result is worth recognizing. The p-value of 0.120 is not extremely high, considering that endogeneity remediation inevitably yields less efficient estimates (Semadeni *et al.*, 2014) and the relatively small sample size in this study. The negative sign of the coefficient indicates that the relationship has the expected direction: with a higher probability of engaging in competence failures, firms are less likely to appoint liberal CEOs. Specifically, the mean predicted probability of selecting a liberal CEO is only 0.45 for firms with competence failures, whereas the same probability is 0.59 for firms with integrity violations, averaging across the sample values of the control variables.

Notably, one cannot rule out the existence of selection bias based on the statistically insignificant inverse Mills ratio ($\hat{\lambda} = -1.864, p = 0.065$). There is high potential for misspecification in applying the selection model because the model gives high discretion to an individual researcher to decide the appropriate functional form and exclusion restrictions (Lennox *et al.*, 2012). In estimations with moderately strong instruments, as demonstrated in this study, the inverse Mills ratio may result in an inaccurate standard error, yet the model still returns unbiased coefficient estimates (Certo *et al.*, 2016). As the correlation between the inverse Mills ratio and the primary explanatory variable in Model 3 is smaller than 0.3 in absolute terms ($\rho = -0.26$), it can be said that the choice of exclusion restrictions was appropriate (Bushway *et al.*, 2007; Leung *et al.*, 1996).

Table 2. Two-stage Treatment Effects Probit Models

	Model 1			Model 2			Model 3		
	Estimate	*SE*	*P-value*	*Estimate*	*SE*	*P-value*	*Estimate*	*SE*	*P-value*
Controls									
Constant	3.010	[0.910]	[0.001]	-0.068	[0.436]	[0.876]	0.288	[0.503]	[0.566]
Old CEO's liberalism	-0.187	[0.355]	[0.600]	0.782	[0.301]	[0.009]	0.788	[0.303]	[0.009]
Total assets	-0.078	[0.045]	[0.087]	0.005	[0.044]	[0.905]	0.005	[0.044]	[0.908]
ROA	-0.145	[0.119]	[0.224]	0.105	[0.105]	[0.313]	0.117	[0.104]	[0.259]
Debt-to-equity ratio	0.000	[0.002]	[0.901]	-0.002	[0.001]	[0.126]	-0.002	[0.001]	[0.139]
HQ state	-0.491	[0.204]	[0.810]	-0.390	[0.165]	[0.018]	-0.391	[0.165]	[0.018]
Female CEO	-0.005	[0.496]	[0.993]	-0.422	[0.439]	[0.337]	-0.423	[0.451]	[0.349]
Inverse Mill's ratio				-1.634	[1.022]	[0.110]	-1.864	[1.010]	[0.065]
Exclusion restrictions									
Proportion of independent directors	-1.521	[0.931]	[0.102]						
CEO duality	0.239	[0.211]	[0.255]						
Hypothesized variables									
Competence violation							-0.352	[0.226]	[0.120]
Model statistics									
Year fixed effects		YES			YES			YES	
Pseudo R-sq		0.08			0.06			0.05	
n		282			282			282	

* standard errors are robust and clustered by firm

Table 3 shows the analysis results regarding hypothesis 2, which predicts analyst evaluations with an endogenous explanatory variable – congruence between the nature of

the violation and the newly appointed CEO's political ideology. Model 4 contains the estimates from the first-stage probit regression. The same exclusion restrictions in hypothesis 1 are employed again in testing hypothesis 2. As seen in the table, the proportion of independent directors and CEO duality are moderately strong instruments ($\hat{\gamma} = 0.929, p = 0.200\ and\ \hat{\gamma} = -0.288, p = 0.117$) in predicting the probability of congruence. Combined with the likelihood ratio test of lack of fit ($\chi^2(2) = 4.75, p = 0.09$), it can be determined that there exists an effect of exclusion restrictions in predicting the probability of congruence.

Model 5 includes the results from the negative binomial regression with the control variables and the inverse Mills ratio computed from the estimates in Model 4. and the parameter estimates for the full model are given in Model 6. The parameter estimates for the full model are given in Model 6. Although the coefficient is statistically significant, its sign contradicts the expected relationship ($\hat{\beta} = -1.648, p = 0.000$). Interpreting the coefficient in the predicted counts, it is expected that the firms with congruence will receive 0.16 upward revisions on average compared to 0.83 upward revisions for firms without congruence while holding other control variables constant at their means. Note that the correlation between the inverse Mills ratio and congruence is smaller than 0.3 in absolute terms ($\rho = -.21$), but the hazard lambda is highly insignificant in the full model ($\hat{\lambda} = -0.066, p = 0.873$). Given these observations, one can suspect the potential of additional data generating process to trigger excess zeros, in which case the zero-inflated model can be considered.

Table 3. Two-stage Treatment Effects Negative Binomial Models

	Model 4			Model 5			Model 6		
	Estimate	*SE*	*P-value*	*Estimate*	*SE*	*P-value*	*Estimate*	*SE*	*P-value*
Controls									
Constant	-0.590	[0.725]	[0.416]	-1.183	[0.615]	[0.054]	-0.118	[0.426]	[0.782]
Old CEO's liberalism	-0.902	[0.290]	[0.002]	0.200	[0.395]	[0.612]	0.114	[0.292]	[0.697]
Total assets	0.055	[0.044]	[0.207]	-0.031	[0.039]	[0.423]	-0.018	[0.027]	[0.499]
ROA	-0.223	[0.086]	[0.010]	-0.181	[0.130]	[0.164]	-0.066	[0.093]	[0.475]
Debt-to-equity ratio	0.002	[0.001]	[0.117]	-0.001	[0.001]	[0.515]	0.000	[0.001]	[0.490]
HQ state	0.333	[0.167]	[0.046]	-0.135	[0.167]	[0.417]	-0.101	[0.121]	[0.402]
Female CEO	-0.253	[0.440]	[0.565]	-0.493	[0.427]	[0.249]	-0.448	[0.322]	[0.164]
Number of analyst recommendations	-0.001	[0.001]	[0.504]	0.000	[0.000]	[0.415]	0.000	[0.001]	[0.678]
Inverse Mill's ratio				0.619	[0.570]	[0.277]	-0.066	[0.413]	[0.873]
Exclusion restrictions									
Proportion of independent directors	0.929	[0.724]	[0.200]						
CEO duality	-0.288	[0.184]	[0.117]						
Hypothesized variables									
Congruence							-1.648	[0.188]	[0.000]
Model statistics									
Year fixed effects		YES			YES			YES	
Pseudo R-sq		0.09			0.03			0.17	
n		282			282			282	

* standard errors are robust and clustered by firm

DISCUSSION

This study's contributes to research on CEO selection by disentangling the black box of the board's selection process. I dissected the nature of crises and analyzed how the different attribution influences how board directors choose CEOs. This paper is also one of the early studies that consider the dimensions of competence and integrity failure in examining the organizational crisis. Instead of focusing on one specific type of misconduct or treating crises uniformly regardless of their different natures, I introduced a new lens to better highlight the antecedents and consequences of crisis according to the specific nature.

Adding to the theoretical contribution to management research, this paper illustrates the application of a two-stage treatment model. Given the increasing interest in management research regarding the correction of endogeneity, this paper has provided a few guidelines that future researchers can follow to investigate the validity of instruments. Future researchers could seek theoretical support to the choice of exclusion restrictions in the literature, run formal tests on validity of instruments, including the likelihood ratio test, partial pseudo-R2. They could also compare the signs of coefficient to the anticipated direction. These close examination illuminates a path for management researchers to follow for how to rigorously apply two-step estimation methods in correcting endogeneity.

However, this study has some limitations. As seen in the results section, the hypotheses were not supported as well as the instrumental validity. One can assume that

the insignificant result stems from an imperfect research design, perhaps the wrong hypotheses were asked or the instruments were too weak. Also, using a probit model to estimate the parameters in the second stage constrained the testing of the existence of endogeneity as well as overidentification. The Durbin–Wu–Hausman test and the Sargan test utilize residuals from linear models, which are not observed in the non-linear models such as the probit or negative binomial models.

Future research can contribute to the literature by finding methods to circumvent the limitations of the present study. For example, researchers can figure exclusion restrictions other than the ones used in this study so that the instruments strongly predict the first-stage response variables. Another possible avenue for further examination lies in the utilization of machine learning techniques. Lexical analysis of the media using machine learning methods would more efficiently capture the nature of dismissal than a manual review. Also, the extension to analyst reports would more accurately gauge the level of investor perception and approval.

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APPENDICES

A. R Code

```
rm(list = ls(all = TRUE))
library(dplyr)
library(readxl)
library(tibble)
library(writexl)
library(readstata13)
library(stringr)
library(foreign)
turnover <- read.dta13("D:/turnover.dta")
turnover <- subset(turnover, turnover$ceoann == "CEO")
o.flag <- NULL
for (i in 1:nrow(turnover)){
  turnover$o.flag[i] <- ifelse(turnover$gvkey[i] == turnover$gvkey[i+1]
                        & turnover$execid[i] != turnover$execid[i+1],
                        1, 0)
}
i.flag <- NULL
for (i in 2:nrow(turnover)){
  turnover$i.flag[1] <- 0
  turnover$i.flag[i] <- ifelse(turnover$gvkey[i] == turnover$gvkey[i-1]
                        & turnover$execid[i] != turnover$execid[i-1],
                        1, 0)
}
out <- subset(turnover, o.flag==1)
colnames(out) <- paste("o", colnames(out), sep=".")
inc <- subset(turnover, i.flag==1)
colnames(inc) <- paste("i", colnames(inc), sep=".")
turnover <- cbind(out, inc)
turnover$date <- as.Date(if_else(is.na(turnover$i.becameceo), turnover$o.leftofc,
turnover$i.becameceo))
turnover <- turnover[complete.cases(turnover$date),]
write_xlsx(turnover, path="D:/turnover.xlsx")
rsn <- data.frame(read_excel(path="D:/rsn.xlsx", sheet="Sheet1"))
dsml <- subset(rsn, violation==1)
write_xlsx(dsml, path="D:/dsml.xlsx")
ctrl <- dsml
cpst <- read.dta13("D:/ctrl_cpst.dta")
cpst <- cpst[!duplicated(cpst[c("gvkey","fyear")]),]
```

```
colnames(cpst)
cpst$lagFY <- cpst$fyear + 1
cpst <- cpst[,-c(2:3)]

ctrl <- merge(x=ctrl, y=cpst, by.x=c("i.gvkey","i.year"), by.y=c("gvkey","lagFY"),
            all.x=TRUE, all.y=FALSE, sort=FALSE)
prob <- ctrl[is.na(ctrl$at),]$at
meanv <- mean(ctrl$at, na.rm=TRUE)
sdv <- sd(ctrl$at, na.rm=TRUE)
rdraw <- rnorm(n=5000, mean=meanv, sd=sdv)
rdraw <- rdraw[rdraw>0]
prob <- rdraw[1:length(prob)]
ctrl$at[is.na(ctrl$at)] <- prob
prob <- ctrl[is.na(ctrl$gp),]$gp
meanv <- mean(ctrl$gp, na.rm=TRUE)
sdv <- sd(ctrl$gp, na.rm=TRUE)
rdraw <- rnorm(n=5000, mean=meanv, sd=sdv)
rdraw <- rdraw[rdraw>0]
prob <- rdraw[1:length(prob)]
ctrl$gp[is.na(ctrl$gp)] <- prob
prob <- ctrl[is.na(ctrl$lt),]$lt
meanv <- mean(ctrl$lt, na.rm=TRUE)
sdv <- sd(ctrl$lt, na.rm=TRUE)
rdraw <- rnorm(n=5000, mean=meanv, sd=sdv)
rdraw <- rdraw[rdraw>0]
prob <- rdraw[1:length(prob)]
ctrl$lt[is.na(ctrl$lt)] <- prob
prob <- ctrl[is.na(ctrl$ni),]$ni
meanv <- mean(ctrl$ni, na.rm=TRUE)
sdv <- sd(ctrl$ni, na.rm=TRUE)
rdraw <- rnorm(n=5000, mean=meanv, sd=sdv)
rdraw <- rdraw[rdraw>0]
prob <- rdraw[1:length(prob)]
ctrl$ni[is.na(ctrl$ni)] <- prob
prob <- ctrl[is.na(ctrl$revt),]$revt
meanv <- mean(ctrl$revt, na.rm=TRUE)
sdv <- sd(ctrl$revt, na.rm=TRUE)
rdraw <- rnorm(n=5000, mean=meanv, sd=sdv)
rdraw <- rdraw[rdraw>0]
prob <- rdraw[1:length(prob)]
ctrl$revt[is.na(ctrl$revt)] <- prob
prob <- ctrl[is.na(ctrl$mkvalt),]$mkvalt
meanv <- mean(ctrl$mkvalt, na.rm=TRUE)
sdv <- sd(ctrl$mkvalt, na.rm=TRUE)
rdraw <- rnorm(n=5000, mean=meanv, sd=sdv)
rdraw <- rdraw[rdraw>0]
```

```
prob <- rdraw[1:length(prob)]
ctrl$mkvalt[is.na(ctrl$mkvalt)] <- prob
prob <- ctrl[is.na(ctrl$dltt),]$dltt
meanv <- mean(ctrl$dltt, na.rm=TRUE)
sdv <- sd(ctrl$dltt, na.rm=TRUE)
rdraw <- rnorm(n=5000, mean=meanv, sd=sdv)
rdraw <- rdraw[rdraw>0]
prob <- rdraw[1:length(prob)]
ctrl$dltt[is.na(ctrl$dltt)] <- prob
prob <- ctrl[is.na(ctrl$teq),]$teq
meanv <- mean(ctrl$teq, na.rm=TRUE)
sdv <- sd(ctrl$teq, na.rm=TRUE)
rdraw <- rnorm(n=5000, mean=meanv, sd=sdv)
rdraw <- rdraw[rdraw>0]
prob <- rdraw[1:length(prob)]
ctrl$teq[is.na(ctrl$teq)] <- prob
ctrl$l_at <- log(ctrl$at)
ctrl$roa <- ctrl$ni / ctrl$at
ctrl$der <- ctrl$dltt / ctrl$teq
ctrl$l_mkvalt <- log(ctrl$mkvalt)
iss <- read.dta13("D:/ctrl_iss.dta")
iss$indep <- ifelse(iss$classification=="I",1,0)
iss1 <- as.data.frame.table(xtabs(indep~ticker+year, iss) / xtabs(~ticker+year, iss))
colnames(iss1)[3] <- "pindirect"
ctrl <- merge(ctrl, iss1, by.x=c("i.ticker","i.year"), by.y=c("ticker", "year"),
          all.x=TRUE, all.y=FALSE, sort=FALSE)
iss$dual <- ifelse(iss$name==iss$primary_employer & !is.na(iss$employment_ceo) &
!is.na(iss$employment_chairman), 1, 0)
iss2 <- as.data.frame.table(xtabs(dual~ticker+year, iss))
iss2$Freq <- ifelse(iss2$Freq>=1, 1, 0)
colnames(iss2)[3] <- "dual"
ctrl <- merge(ctrl, iss2, by.x=c("i.ticker","i.year"), by.y=c("ticker", "year"),
          all.x=TRUE, all.y=FALSE, sort=FALSE)
ctrl$pindirect <- ifelse(ctrl$pindirect=="NaN",NA,ctrl$pindirect)
prob <- ctrl[is.na(ctrl$pindirect),]$pindirect
meanv <- mean(ctrl$pindirect, na.rm=TRUE)
sdv <- sd(ctrl$pindirect, na.rm=TRUE)
rdraw <- rnorm(n=5000, mean=meanv, sd=sdv)
rdraw <- rdraw[rdraw>0]
prob <- rdraw[1:length(prob)]
ctrl$pindirect[is.na(ctrl$pindirect)] <- prob
prob <- ctrl[is.na(ctrl$dual),]$dual
meanv <- mean(ctrl$dual, na.rm=TRUE)
sdv <- sd(ctrl$dual, na.rm=TRUE)
rdraw <- rnorm(n=5000, mean=meanv, sd=sdv)
rdraw <- rdraw[rdraw>0]
```

```
prob <- rdraw[1:length(prob)]
ctrl$dual[is.na(ctrl$dual)] <- prob
ctrl$dual <- ifelse(ctrl$dual>=0.5, 1, 0)
hq <- data.frame(read_excel("D:/03 dsml_hq.xlsx"))
hq <- unique(hq[,c("i.gvkey","i.state")])
ctrl <- subset(ctrl, select=-i.state)
ctrl <- merge(x=ctrl, y=hq, by="i.gvkey", all.x=TRUE, all.y=FALSE)
vote <- read.table("D:/redstate.txt", col.names=c("state","hqred"))
ctrl <- merge(ctrl, vote, by.x="i.state", by.y="state", all.x=TRUE, sort=FALSE)
ctrl$female <- ifelse(ctrl$i.gender=="FEMALE",1,0)
ctrl$competence <- ifelse(ctrl$competence==1,1,0)
dv <- ctrl
pi.given <- read.dta13("D:/politicalideology_ceos.dta")
pi.given <- pi.given[,c("execid","politicalideology")]
dv <- merge(dv, pi.given, by.x="i.execid", by.y="execid", all.x=TRUE, all.y=FALSE,
sort=FALSE)
pi.add <- data.frame(read_excel("D:/addpi.xlsx"))
pi.add <- pi.add[,c("i.ceoid","ideo.add")]
pi.add$i.ceoid <- as.character(str_pad(pi.add$i.ceoid, 5, pad="0"))
dv <- merge(dv, pi.add, by.x="i.execid", by.y="i.ceoid", all.x=TRUE, all.y=FALSE,
sort=FALSE)
dv$i.pi <- ifelse(!is.na(dv$politicalideology), dv$politicalideology, dv$ideo.add)
write_xlsx(subset(dv, is.na(dv$i.pi)==TRUE), path="D:/addpi2.xlsx")
addpi2 <- data.frame(read_excel("D:/addpi2_res.xlsx"))
addpi2 <- addpi2[,c("i.execid","i.pi")]
addpi2$i.pi <- ifelse(is.na(addpi2$i.pi),0.5,addpi2$i.pi)
dv <- merge(x=dv, y=addpi2, by="i.execid", all.x=TRUE, all.y=FALSE, sort=FALSE)
dv$i.pi <- ifelse(!is.na(dv$i.pi.x), dv$i.pi.x, dv$i.pi.y)
outpi1 <- data.frame(read_excel(path="D:/outpi1.xlsx", sheet="Sheet1"))
outpi1 <- outpi1[,c("o.ceoid","o.pi")]
outpi1$o.ceoid <- as.character(str_pad(outpi1$o.ceoid, 5, pad="0"))
dv <- merge(x=dv, y=outpi1, by.x="o.execid", by.y="o.ceoid", all.x=TRUE,
all.y=FALSE, sort=FALSE)
write_xlsx(subset(dv, is.na(dv$o.pi)==TRUE), path="D:/outpi2.xlsx")
outpi2 <- data.frame(read_excel(path="D:/outpi2_res.xlsx", sheet="Sheet1"))
outpi2 <- outpi2[,c("o.execid","pol.idx")]
outpi2$pol.idx <- ifelse(is.na(outpi2$pol.idx), 0.5, outpi2$pol.idx)
dv <- unique(merge(x=dv, y=outpi2, by="o.execid", all.x=TRUE, all.y=FALSE,
sort=FALSE))
dv$o.pi <- ifelse(is.na(dv$o.pi), dv$pol.idx, dv$o.pi)
nrow(subset(dv, i.pi==0.5))
dv$i.pi[which(dv$i.pi==0.5)][1:67] <- 0.499
nrow(subset(dv, i.pi==0.5))
dv$i.pi[which(dv$i.pi==0.5)] <- 0.501
dv$i.pi.2 <- ifelse(dv$i.pi>=0.5, 1, 0)
```

```
hist(x=dv$i.pi, breaks=1/0.05, probability=TRUE, main="Histogram of CEO liberalism",
xlab="CEO liberalism score")
mean(dv$i.pi)
ibes <- read.dta13("D:/ ibes.dta")
dv$date <- as.Date(dv$date)
ibes$year <- format(as.Date(ibes$statpers), "%Y")
ibes2 <- data.frame(date=as.Date(character()), base=numeric(),
                after=numeric(), nrec=numeric())[1:nrow(dv),]
for(i in 1:nrow(dv)){
  ibes2$date[i] <- subset(ibes, ibes$oftic == dv$i.ticker[i] & ibes$statpers >=
dv$date[i])[1,]$statpers
  ibes2$numup[i] <- subset(ibes, ibes$oftic == dv$i.ticker[i] & ibes$statpers >=
(dv$date[i]))[1,]$numup +
                subset(ibes, ibes$oftic == dv$i.ticker[i] & ibes$statpers >=
(dv$date[i]))[2,]$numup
  ibes2$nrec[i] <- sum(subset(ibes, ibes$oftic == dv$i.ticker[i] & ibes$statpers >=
(dv$date[i]-180)
                        & ibes$statpers <= (dv$date[i]+180))$numrec)
}
ibes2$ticker=dv$i.ticker
prob <- ibes2[is.na(ibes2$numup),]$numup
meanv <- mean(ibes2$numup, na.rm=TRUE)
sdv <- sd(ibes2$numup, na.rm=TRUE)
rdraw <- rnorm(n=5000, mean=meanv, sd=sdv)
rdraw <- rdraw[rdraw>0]
prob <- rdraw[1:length(prob)]
ibes2$numup[is.na(ibes2$numup)] <- prob
ibes2$numup <- round(ibes2$numup)
prob <- ibes2[is.na(ibes2$nrec),]$nrec
meanv <- mean(ibes2$nrec, na.rm=TRUE)
sdv <- sd(ibes2$nrec, na.rm=TRUE)
rdraw <- rnorm(n=5000, mean=meanv, sd=sdv)
rdraw <- rdraw[rdraw>0]
prob <- rdraw[1:length(prob)]
ibes2$nrec[is.na(ibes2$nrec)] <- prob
ibes2 <- ibes2[,c("ticker","numup","nrec","buyc")]
dv <- cbind(dv, ibes2)
identical(dv$i.ticker, dv$ticker)
dv$cong <- ifelse(dv$competence==1 & dv$i.pi.2==0, 1, ifelse(dv$competence==0 &
dv$i.pi.2==1, 1, 0))
dv[which(is.na(dv$i.sic)),c("i.coname")]
dv[which(is.na(dv$i.sic)),c("sic")] <- c(6531, 5632, 6141)
fdata <- dv[,c("i.pi.2","numup","competence","cong","o.pi","l_at","roa","der","hqred",
          "female","nrec","pindirect","dual","i.sic","i.year","i.gvkey")]
colnames(fdata) <-
c("inceolib","analeval","competence","congruence","outceolib","asset","roa",
```

```
                "der","hqred","female","nrec","pindirect","dual","sic","year","gvkey")
write.dta(fdata, "D:/Dropbox/00 University of Georgia/00 Thesis/data/fdata.dta")
```

B. Stata Code

```
clear
use "D:\fdata.dta"
probit competence pindirect dual outceolib asset roa der hqred female i.year
test (pindirect=0) (dual=0)
matrix Vp = e(V)
capture drop phat e
predict phat, xb
gen lambda = normalden(phat) / normal(phat)
probit inceolib lambda outceolib asset roa der hqred female i.year, vce(cluster gvkey)
probit inceolib i.competence lambda outceolib asset roa der hqred female i.year,
vce(cluster gvkey)
correlate
margins i.competence, at((mean) lambda outceolib asset roa der hqred female year)
margins, dydx(i.competence) at((mean) lambda outceolib asset roa der hqred female
year)

clear
use "D:\fdata.dta"
probit congruence pindirect dual outceolib asset roa der hqred female nrec i.year,
vce(cluster gvkey)
test (pindirect=0) (dual=0)
matrix Vp = e(V)
capture drop phat e
predict phat, xb
gen lambda = normalden(phat) / normal(phat)
nbreg inceolib lambda outceolib asset roa der hqred female nrec i.year, vce(cluster
gvkey)
nbreg inceolib i.congruence lambda outceolib asset roa der hqred female nrec i.year,
vce(cluster gvkey)
correlate
margins i.congruence, at((mean) lambda outceolib asset roa der hqred female nrec year)
margins, dydx(i.congruence) at((mean) lambda outceolib asset roa der hqred female nrec
year)
```