POISON PILLS AND CEOS: THE RÉSUMÉ MATTERS

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Abstract

Previous research has linked poison pill to corporate governance characteristics such as ownership structure and board composition while overlooking the attributes of top managers involved in poison pill decision. Based on upper echelons perspective, we changed the focus by investigating the effect of CEO characteristics on poison pills, as measured by age, business education, and outside directorships. Using a sample of Fortune 500 manufacturing firms, we found that CEO business education is positively associated with poison pills, while CEOs' outside directorships are negatively associated with poison pills. Furthermore, we found that CEO duality moderates the relationship between CEO business education and poison pills. We make implications for both corporate governance research and managerial practices regarding firms' anti-takeover provisions.

Keywords: Poison Pills, CEO, Business Education, Outside Directorships

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Introduction

Poison pills, or shareholder rights plans, enable firms to deter takeover attempts by selling additional shares of stock at a discount. One effect of these plans is to insulate CEOs from takeover-related unemployment. We investigate the proposition that CEOs may vary in their motivation and power to influence their firms' use of poison pills. We draw from upper echelon theory (Hambrick and Mason, 1984; Hambrick, 2007), which holds that top managers vary in their perceptions and interpretations of events, and that their choices will vary with observable individual characteristics such as age and educational background. Upper echelons theory was developed to add explanatory power to executives' strategic choices and firm performance. We extend the theory to the question of firms' use of poison pills because it addresses CEOs' perspective on strategic policies, and that managerial motivation associates with observable characteristics. We complement upper echelons theory with social network theory (Adler and Kwon, 2002; Granovetter, 1983; Wasserman and Galaskiewicz, 1994), which holds that personal networks are associated with information and power. Social network theory complements the upper echelons approach because it does not take into account individual characteristics of CEOs, only their position in a network. We focus on degree centrality of CEOs in an industry network, and investigate whether CEOs with higher centrality have less motivation for poison pills because they can achieve job security through their position in the industry social network.

We propose that not all CEOs will desire poison pills equally. Some CEOs may be more risk averse and/or have higher desire for job security than others. And that this desire associates with observable characteristics of CEOs. So, we investigate how CEO characteristics such as age, business education, and membership in outside directorships.

Our study is of poison pill use in 2007, a time of growing anti-poison pill sentiment. According to the Institutional Shareholder Services, Inc., poison pills were losing popularity since the early 2000s in the U.S. (Katz and McIntosh, 2006). Since 1984, when poison pills were first introduced, they were popular

in an era of frequent mergers and acquisitions. But subsequently, from the late 1990s, investor sentiment became more negative as they were associated with CEO ineffectiveness. There were more than 2,200 firms with poison pills in 2001, but only about 900 in early 2011 (Bab and Neenan, 2011). Moreover, firms' stock price began to respond negatively with the announcement of poison pills (Bebchuk *et al*., 2010; Business Wire, 2000). As a result of shareholder activism, fewer companies adopted or maintained their poison pills. Laide (2008, ¶ 4) mentioned that "the number of companies that have chosen to renew their existing poison pill measures has fallen from a high of 85% in 2001 to about 32% over the past three years [2005~2007]".

Our research has implications for investors and researchers. We focus on observable firm and CEO characteristics, so our approach should be feasible for investors and analysts to replicate and extend. Investors who are concerned about poison pill provisions may develop a better understanding of CEOs who may prefer poison pills. Our research also informs business researchers, who can gain an understanding of firms' decisions to use poison pills.

In the following sections we will a) summarize the literature on poison pills and shareholder value, which informs our methodology and basis for our study, b) summarize the subset of studies that distinguish the firms that have adopted poison pills from those that have not, c) present our hypotheses, d) show our results, and e) discuss the implications of our study for research and practice.

1. Literature review and theory development

In this section, we first review the literature regarding the relationship between poison pills and shareholder value based on contrasting perspectives of *shareholder interest* and *management entrenchment* (Sundaramurthy, 2000). Second, we review the derivative literature on the characteristics of firms that use poison pills. Third, we extend this theory by adding concepts from upper echelons theory and social network theory. From these, we derive hypotheses.

2.1. Poison pills and shareholder value

The literature on poison pills indicates that they result from a complex process. Researchers offer competing arguments on the effect of poison pills and other antitakeover provisions on shareholder value (Bebchuk *et al*., 2009; Caton and Goh, 2008; Grossman and Hart, 1980; Heron and Lie, 2006; Jennings and Mazzeo, 1986; Sundaramurthy *et al*., 1997). According to this *shareholder interest hypothesis*, poison pills induce a higher bidding price in corporate control transactions (Buchholtz and Ribbens, 1994; Carney and Silverstein, 2003; Comment and Schwert, 1995; Mallette and Fowler, 1992; Sundaramurthy, 2000). Takeover defense measures enable managers and boards of directors to negotiate greater benefits for their shareholders and to achieve a capital gain (Ryngaert, 1988).

Another possible benefit of poison pills to shareholders is that they allow CEOs to focus on their firms' long-term competitiveness rather than short-term returns (e.g., Mahoney *et al*., 1997). For instance, Danielson and Karpoff (2006), using 302 firms using poison pills from 1984 to 1992, found that long-term operating performance improved after the adoption of poison pills.

One implication of the shareholder interest perspective is that better corporate governance may be necessary for gains in shareholder value with poison pills (Baysinger and Hoskisson, 1990; Shleifer and Vishny, 1997; Williamson, 1984). Researchers have found that poison pills associate with a proportion of independent directors (Danielson and Karpoff, 1998), institutional shareholding (Danielson and Karpoff, 1998; Evans *et al*., 2009; Mallette and Fowler, 1992). Brickley *et al*. (1994) found that the announcement of poison pills positively associates with positive stock price response when the boards are dominated by outside directors.

On the other hand, the *management entrenchment hypothesis* argues that poison pills reduce shareholder value because they insulate management from the market for corporate control (Bebchuk *et al*. 2009; Bebchuk *et al*. 2010; Laide 2010; Walsh and Seward 1990). Firms with antitakeover provisions were found to be 26 percent less likely to receive takeover attempts (Pound, 1987). And O'Hara (1989) argued that poison pills increase management and board power relative to shareholders.

Agency theory provides a basis for the management entrenchment hypothesis (Berle and Means, 1932; Jensen and Meckling, 1976). It explains the different preferences and risk profiles of principles (i.e. shareholders), and agents (i.e. managers). With poison pills, managers may act more out of self-interest than organizational welfare (Eisenhardt, 1989; Walsh and Seward, 1990). Studies have found the negative stock market response to the use of poison pills (Bebchuk *et al*. 2009; Bebchuk *et al*. 2010; Jarrell and Poulsen, 1987; Malatesta and Walkling, 1988; Ryngaert, 1998). Moreover, negative returns for shareholders are larger when the anti-takeover defense was adopted without the approval of shareholders (Jarrell and Poulsen, 1987).

2.2. Corporate governance and poison pills

A derivative stream of research investigates the characteristics of firms that use or adopt poison pills. It often aims to link poison pill use with either the management entrenchment or shareholder interest hypothesis. However, there is no clear consensus. Some researchers hold that poison pills associate with a lack of monitoring and incentive misalignment (Mallette and Fowler, 1992). CEO duality, or having the CEO also serve as board chair, has been positively associated with poison pills (Mallette and Fowler, 1992). But Paul *et al*. (2009) found that firms with higher institutional ownership were more likely to repeal anti-takeover provisions. Some researchers found that insider ownership was negatively associated with poison pills (Danielson and Karpoff, 1998; Davis, 1991; Heron and Lie, 2006; Mallette and Fowler, 1992). Table 1 shows the range of studies in this area. Some of the findings support the shareholder interest hypothesis, and some support the management entrenchment hypothesis.

Table 1. Summary of Literature on Poison Pill Use

Paper	Sample	Variables	Findings	Shareholder value
Davis, (1991)	Fortune 500 firms between 1984~1989 (N=440)	IV: inside ownership, golden parachute, concentrated ownership Insider board, interlock network centrality, interlocks with other firms, prevalence of pill in a firm's industry DV: Poison Pill	- Inside ownership (-) - Concentrated ownership (-) - Interlock network centrality (+) - Interlocks with other firms (+)	mixed
Mallette and Fowler (1992)	Manufacturing firms (N=673)	IV: board independence, duality, outside director's tenure, CEO's tenure, inside and outside director holding, institutional holding DV: Poison Pill	- Duality (+) - Inside director ownership (-) - Institutional ownership (+) - Duality with high board independence (+) - Low CEO tenure with high independent director tenure (+)	mixed
Sundaramurthy (1996)	SandP 500 firms between 1984~1988 (N=185)	IV: Institutional holdings, Managerial stock ownership, proportion of outside directors, outsider's loyalty, director's equity ownership, duality, DV: 6 antitakeover provisions (including poison pill)	- Institutional holdings (-) - Managerial ownership (U-shape) - Outsider's loyalty (+) - Number of prior provisions (-)	mixed

Danielson and Karpoff (1998)	SandP 500 firms between 1984~1989 (N=513)	IV: Institutional holdings, insider ownership, board independence DV: 20 antitakeover provisions (including poison pill)	- Institutional holdings (+) - Board independence (+) - Insider ownership (-)	mixed
Coates (2000)	IPO firms (N=320)	IV: Law firm characteristics, firm age, Venture capital backing, firm age, industry-level MandA activity DV: Defense provisions (e.g., dual class stock, classified board)	- Advisory by large law firms (+) - High-quality underwriters (+) - Venture capital backing (+)	mixed
Field and Karpoff (2002)	IPO firms between 1988~1992 (N=576)	IV: compensation, CEO age, CEO tenure, Insider ownership, Board independence, Board Size, and Duality DV: 10 types of antitakeover provisions (including poison pill)	- Compensation (+) - CEO age (-) - Insider ownership (-) - Board size (+) - Duality (+)	mixed
Heron and Lie, (2006)	Unsolicited takeover attempts between 1985~1998 (N=526)	IV: Excess cash/asset, pension overfund/asset, market-to-book asset, insider ownership, staggered board, CEO compensation, board independence, duality, stock return DV: Poison Pill	- Excess cash/asset (-) - Insider ownership (-) - Staggered board (+) - CEO compensation (+) - Duality (-) - Stock return (-)	mixed
Evans, Pyles, and Choo (2009)	U.S. Firms between 1984~1990 (N=157)	IV: Pressure-sensitive / Pressure-resistant investors, golden parachute, outside director proportion, outside director ownership, insider ownership DV: Poison Pill	- Pressure-sensitive investors (+) - Pressure-resistant investors (-) - Golden parachute (+)	negative

Note: IV= Independent variable(s); DV=dependent variable(s)
(+)/(-) indicates greater/lesser likelihood of poison pill use

These studies used different samples such as manufacturing firms, IPOs, law firms, and Fortune 500 firms. They used both cross-sectional and longitudinal models. They included different sets of variables for (a) firm characteristics such as market return, market to book value, other types of antitakeover provisions, and industry, (b) governance characteristics such as CEO duality, board size, board independence, insider holdings, block holdings, and institutional shareholdings, and (c) CEO characteristics such as CEO ownership and compensation structure. And they differed by time frame, which matters because attitudes towards poison pills have evolved (Bebchuk *et al*., 2010).

Different studies generate different results with different implications for the association between poison pill use and shareholder value. The large portion of mixed results suggests that the poison pill policies are the outcome of a nuanced and complex process, and that the inclusion of more information would improve the models' explanatory power.

We draw a few general implications from this research stream. First, given that corporate governance is evolving and that investors are accounting for governance when evaluating equities, studies will differ in their findings based on when they were done. Second, the differences between poison pills and other types of antitakeover policies suggest that it is worthwhile to analyze poison pills independently rather

than as one of a collection of antitakeover measures. And third, the models may benefit from the inclusion of more information such as, we think, CEO power and desire for poison pills.

2.3. Upper echelon and social network theory

We investigate the relationship between the use or adoption of poison pills and CEO characteristics. Takeover defenses such as poison pills are usually influenced by CEOs as individuals and can be implemented without the approval of shareholders. We expect CEOs to vary in their preference and power in strategic decision making (Datta and Datta, 1996; Davis, 1991). To blend the different levels of analysis (individual CEOs and organization), we apply upper echelon theory and social network theory.

According to the upper echelons theory (Carpenter *et al*., 2004; Hambrick, 2007; Hambrick and Mason, 1984), firms' strategic decisions can be viewed in part as the reflection of their top managers. The theory argues that (a) strategic decisions in firms reflect managers' values, perceptions and cognitions, (b) these values and cognitions associate with observable characteristics of top managers such as age and education, and (c) as a result, significant organizational outcomes are associated with the top manager's observable characteristics. We use only a part of this literature in that we do not investigate characteristics of the entire top management team, but only the CEO. Previous research has argued that CEO characteristics influence firms' strategies such as R & D investment, diversification strategy fit, new market entry, corporate social responsibility, board composition and takeover resistance (Barker and Muller, 2002; Buchholtz and Ribbens, 1994; Combs *et al*., 2007; Eggers and Kaplan, 2009; Reed and Reed, 1989; Waldman *et al*., 2006). We extend the theory to firms' use of poison pills, which recognizes that their use is a strategic choice. We propose that CEOs influence firms' poison pill policies as a reflection of their individual perceptions and cognitions. In particular, we investigate the effects of CEO age and CEO education.

3. Hypothesis development

3.1. CEO age and poison pills

CEO age may influence organizational strategic decision-making (Hambrick and Mason 1984). For example, Davidson *et al*. (2007) found that the potential for agency problems increases as CEOs approach their retirement. Researchers have found that CEO age associates with strategic decisions such as compensation (Hitt and Barr, 1989) and strategic change (Wiersema and Bantel, 1992). A common finding is that managers' age associates with conservatism and risk-aversion (Barker and Muller, 2002; Child, 1974; MacCrimmon and Wehrung, 1986). Older managers may desire financial and career security (Cannella and Lubatkin, 1993; D'Aveni and Kesner, 1993; Friedman and Singh, 1989; Hambrick and Mason, 1984). Older CEOs may have limited job mobility (Veiga, 1983). And older CEOs' psychological commitment to the status quo may increase their resistance to takeovers (Stevens *et al*., 1978). Therefore we expect older CEOs to use antitakeover defenses to reduce their risk of job loss. Thus, based on management entrenchment hypothesis, we expect that older CEOs are more likely adopt poison pills to entrench their positions.

Hypothesis 1. CEO age positively associates with their firm's use of poison pills.

3.2. CEO educational background and poison pills

Upper echelons theorists have argued that top managers' education affects strategic decisions (Geletkanycz and Black, 2001). Education might indicate motivation, cognitive preference, and risk propensity (Hambrick and Mason, 1984). According to Hitt and Tyler (1991) as well as Wally and Baum (1994), CEOs with higher education are more likely have greater cognitive complexity which enables the CEOs to be more flexible and to absorb new ideas and thoughts. For instance, Bantel and Jackson (1989) found that innovativeness in banks associated with top management team education. And Tyler and Steensma (1998) examined the influence of educational discipline and its influence on strategic decision making. They found that managers with technical education backgrounds placed more weight on the opportunities provided by technological alliances and innovation.

These findings indicate the effect of top managers' education on strategy, but it is not clear how education may relate to poison pill use. One stream of research suggests that business schools, especially MBA

programs, tend to teach analytic skills to avoid losses rather than entrepreneurial skills and innovation (Barker and Muller, 2002; Hambrick and Mason, 1984). The findings suggest that MBAs and business education associates with risk aversion. Based on this possibility, we expect that CEOs with business-related education backgrounds will focus on their job security and will be more inclined to use poison pills.

Hypothesis 2. Business-related education background of CEOs positively associates with their firms' use of poison pills.

3.3. CEO outside directorships and poison pills: the role of social network theory

Social network theorists have investigated the role of individuals' positions in social networks, not their personal characteristics or attributes, in determining their access to information and power (Brass and Burkhardt, 1993; Friedkin, 1993; Rowley, 1997; Wasserman and Galaskiewitz, 1994). We focus on degree centrality, measured as an actor's number of ties with others in a network. As described by Zupan and Kase (2007, p. 250) "an actor who has a high (valued) outgoing degree centrality would disseminate (either as a source or as a broker) specific solutions to the problem, information, support or ideas to a greater number of his colleagues at a greater frequency." They found that centrality associates with individuals' influence on decisions through their use of power and support. This influence may apply to CEOs and firms' poison pill policies.

Individuals' position in external networks has also been shown to influence their career success and finding jobs (Adler and Kwon, 2002; Granovetter ,1983; Lin and Dumin, 1986). Podolny and Baron (1997) found that large networks of social ties help individuals to increase job mobility. Williamson and Cable (2003) found that firms tend to hire top managers through inter-firm board ties (e.g., Westphal, 1999).

These findings suggest that CEOs will have more power and be more aware of job opportunities to the extent they serve as directors on other firms' boards. Directorships on other firms' boards represent a formal tie between firms, so it is a type of tie that network theorists study. We think that these formal ties are most relevant to our study because directors have direct access to proprietary information and participate in other firms' decisions, including decisions on adopting poison pills.

As a result of network centrality, CEOs may not be worried about losing their current positions. Their power in the business network may substitute for the job security that poison pill policies may provide. They may feel confident about their prospects for winning other positions. Therefore, CEOs who have more outside directorships may be less sensitive about their current job loss, and less motivated to adopt poison pills.

In addition, outside directorships may play a role in the diffusion of common business practices. For example, Davis (1991) found that firms were more likely to adopt poison pills to the extent their boards were interlocked with other firms. We note that Davis' study used a sample from the 1980s when poison pills were popular. While in the late 2000s poison pills were less popular. If overlapping directorates lead firms to 'mimic' other firms' practices (e.g., DiMaggio and Powell, 1983), it is reasonable to assume that in the late 2000s CEOs with more outside directorships would be less likely to use poison pills. So for both the job market information and consensus reasons, we hypothesize that CEO outside directorships will negatively associate with poison pills.

Hypothesis 3. The number of CEO outside directorships negatively associates with the firm's use of poison pills.

3.4. Interaction effect of CEO power on poison pills

CEO *preference* for poison pills, as indicated by age, education background and outside directorships, may not be sufficient to affect their firms' poison pill use. They may also have to have organizational *power* within their organizations, or 'the capacity of individual actors to exert their will' (Finkelstein, 1992, p. 506).

It has been argued that CEO power increases with duality, where CEOs are also board chairpersons. Finkelstein (1992) argued that CEOs have high 'structural power' because of their formal organizational position such as chairman of board. Research supports the view that duality increases CEOs' power (Hambrick, 1981; Harrison *et al*., 1988; Mizruchi, 1983; Ocasio, 1994). Duality may allow for greater CEO personal benefits (Firstenberg and Malkiel, 1994; Herman, 1981; Mace, 1971), higher total compensation (Grossman and Cannella, 2006), and the adoption of poison pills (Mallette and Fowler, 1992).

Given the arguments regarding the hypothesized CEO preference (i.e., age, business education background, and outside directorships), we assume that the power given by CEO duality will strengthen this relationship. We hypothesize a moderating relationship in which CEO preference is increased with CEO power.

Hypothesis 4a. CEO duality strengthens the relationship between age and the firm's use of poison pills.

Hypothesis 4b. CEO duality strengthens the relationship between CEO education and the firm's use of poison pills.

Hypothesis 4c. CEO duality strengthens the relationship between CEO outside directorships and the firm's use of poison pills.

4. Methods

Our statistical analysis relies on a two assumptions. First, the use of poison pills is a strategic decision that can be influenced by the CEO (Peterson *et al*., 2003; Walsh and Seward, 1990). Mahoney *et al.* (1997) also noted that in some instances "management has full discretion in determining when the poison pill provision is applicable" (p. 360). Second, poison pill use is associated with CEO characteristics such as educational background and outside directorships. Given these assumptions, we use a logistic regression analysis with poison pill as the dependent variable and CEO characteristics as independent variables.

We refer to the existing literature on firms' poison pill use to build our database and model. We sampled firms at one point in time and in one sector in order to control for differences in poison pill practices across time and industries. We chose to study poison pill use in 2007 because it is the most recent year that data are available prior to the recent recession. The recession was likely to have a significant effect on corporate practices such as adoption of poison pills due to shrunken market value. We chose a single industry sector (two-digit primary SIC codes of 20 through 39) because it is likely to have limited differences with regard to planning horizon and industry norms. For instance, Laide (2008) found that the average renewal rate of poison pills is 42.9% (consumer service), 27.8% (financial industry), and 16.7% (retail trade) in 2007. We include other antitakeover provisions as a control variable, so our model can be interpreted as investigating the incremental effect of poison pills. Our control variables include firm, shareholder, and board characteristics as noted below.

4.1. Data and sample

Our sample was drawn from *Fortune* 500 firms in the manufacturing sector. Our selection of only large *Fortune* 500 firms controls for differences due to firm size. The initial sample included 174 firms. We then excluded firms where the CEO had been in place for less than one year because he or she would not be likely to affect governance decisions so soon. We also excluded firms acquired or bankrupted within a year, because these firms might change their antitakeover provisions to facilitate acquisition processes. For example, firms usually remove the antitakeover amendments if they solicit mergers with other firms. After these exclusions, the final sample included 162 firms. We used *Corporate Library*, *COMPUSTAT* database, and firm's proxy statements (i.e., SEC Form DEF 14A) to collect organizational and financial data.

To investigate the issue of CEO causality of poison pills, we also conducted an analysis of a subsample of 81 firms that had poison pills in 2006. Of these, 23 dropped their poison pills for 2007. No firm in our sample adopted a poison pill during the same time period. For this subsample, there are fewer observations and lower statistical power than in our primary analysis, but this design controls for

causality – effect of CEO on poison pill decision. At this time, the CEO was in place, and there is limited possibility for reverse causality – or firms implementing poison pills to attract certain CEOs.

4.2. Variables

4.2.1. Dependent variable

The dependent variable is the presence of poison pills in 2007; it is coded as 1 if it is used and 0 if not. 58 firms in our sample firms used poison pills while 104 firms did not. We used the variable from *Corporate Library*. We do not differentiate between long-standing and short-term poison pills in the full model. In our subsample analysis, we do, as noted above. For the full model, we assume that CEO power and motivation matters for maintaining as well as adopting poison pills, even if inherited. We think these assumptions are valid given the recent trend of flexibility in poison pill decisions (RiskMetricks Group, 2009).

4.2.2. Independent variables

All independent variables about CEOs were drawn from the Corporate Library and firm's proxy statements with a one year time lag. *CEO age* was the age of a CEO in year 2006. Following previous literature (Barker and Muller, 2002), *CEO education* was coded according to the number of business or economics degrees earned by the CEO at any level (undergraduate, masters, or Ph.D.). Lastly, *CEO directorship* was measured by the number of directorships he or she serves in other firms. Board memberships of non-profit organization such as university, charitable foundation, and community organization were not included because these affiliations may have less effect on job mobility.

4.2.3. Control variables

We controlled for a number of firm characteristics that were previously identified as influential on poison pill decisions.

Prior ROA (return on assets) was measured by the firm's ROA in 2006. We controlled for this factor because poorly performing firms are more likely to be a target of hostile takeover as their stock price decreases.

Debt ratio was measured by the ratio of total long-term debt to total assets. We included this variable because firms with high level of debt are less attractive to acquirers, so it is reasonable to assume that they would not need poison pill.

Other provisions were measured by the number of other anti-takeover provisions including (a) classified board provision, (b) dual class stock, (c) supermajority merger approval provision, (d) bylaw amendment vote, and (e) corporate charter amendment vote. Thus, this variable ranges from zero to five. This variable shows firm propensity for using anti-takeover policies and therefore should positively associate with poison pill provisions.

Firm size was measured by the number of employees, which has been related to the presence of poison pills (Agrawal and Mandelker, 1990; Davis, 1991; Mallette and Fowler, 1992). Larger firms are difficult to acquire due to the higher capital requirements, so firm size may be a substitute for poison pills.

Board independence was measured by the number of outside directors divided by total number of directors. Boards with a higher proportion of outside members are likely to offer more independent oversight of management (e.g., Fama and Jensen, 1983) and they are less likely to adopt anti-takeover provisions (Guo *et al*., 2008).

Ownership structure such as *5% blockholdings* and *insider holdings* were included in the analysis. A block shareholder, who owns more than 5% of outstanding shares, may influence poison pill decisions (Agrawal and Mandelker, 1990, 1992; Brickley *et al*., 1994; Evans *et al*. 2009; Sundaramurthy, 2000). Insider holdings, the stock owned by top managers and board members with the exclusion of CEO ownership, may affect poison pill policies. For example, Davis (1991) found that high insider ownership decreased the adoption of poison pills because such insiders may have power to veto undesirable takeover

attempts. Loh (1992) found that an increase in insider ownership after the poison pill announcement associated with positive stock price movement. On the other hand, Singh and Harianto (1989) found that firms with diffused ownership structure were more likely to use antitakeover provisions such as golden parachutes.

CEO duality was measured by a dummy variable coded as 1 if the CEO also serves chairman and 0 otherwise. CEO duality may indicate weak monitoring by the board of directors (Baysinger and Hoskisson, 1990; Boyd, 1994; Finkelstein, 1992; Hambrick, 1981). Previous research is mixed, with CEO duality both positively associated (Field and Karpoff, 2002; Mallette and Fowler, 1992) and negatively associated (Heron and Lie, 2006) with the poison pills.

CEO stock ownership was measured by number of CEO's shares relative to total number of shares outstanding. CEOs with significant share holdings are likely to act for the sake of shareholder wealth (McEachern, 1975). Previous researchers have found a negative relationship between the level of CEO stock ownership and takeover resistance (Buchholtz and Ribbens, 1994; Wade *et al*., 1990).

CEO fixed salary was calculated by CEO's fixed salary divided by total annual compensation. This variable indicates the link between managerial compensation and firm performance (Barnhart *et al*., 2000; Daily *et al*., 2003; Mace, 1971). A low value for fixed salary suggests that compensation is based on firm performance, and less likely to have poison pills.

CEO Tenure is the number of years since being named as CEO. Previous studies found that CEOs have more power in the organization as they advance in their careers (Daily and Johnson, 1997; Hill and Phan, 1991; Walters *et al*., 2007).

Finally, we controlled for *industry* effects because the adoption of poison pills may vary across industry, even within the manufacturing sector (Laide, 2008). We controlled for the industry effect by using a series of dummy variables for each firm's primary 2-digit SIC code.

4.3. Statistical analysis

We used multiple logistic regression analysis to examine the effects of CEO characteristics on poison pill use. To address the potential problem of nonspherical disturbances in our analysis, we used a progressive series of exponential root transformation of two skewed variables, insider holdings and CEO stock ownership, until the skewness was below a level of three. We also conducted a series of diagnostic checks on each of our reported models (e.g., nonlinearities, multicollinearity, and influential observations). The variance inflation factors for each variable in our reported models were all less than three up to the point of adding the interaction variables. So model 5 of Table 3 may have some inflated variance due to multicollinearity. But even with this effect, the variables of interest were still significant, and the increase in overall model fit, relative to model 4, supports our interpretation of the findings. We tried a number of different alternative models, but they did not have different results from those reported in Tables 3 and 4. Table 2 provides descriptive statistics, including means, standard deviations, and correlations for all variables.

Table 2. Descriptive Statistics and Correlations

	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Poison Pill Use	0.36	0.48														
2. Prior ROA	0.08	0.07	.05													
3. Debt Ratio	0.20	0.12	.10	-.48**												
4. Other Provisions	1.59	1.18	.16*	-.06	.16*											
5. Firm Size	4.99	1.96	-.29**	-.08	-.06	-.04										
6. Board Independence	.86	.07	.06	.02	-.01	.07	.02									
7. Insider Shareholding	.07	.16	-.03	-.21**	.12	.05	-.14	-.33**								
8. 5% Block Holdings	.18	.16	.06	-.20**	.17*	.01	-.27**	-.04	-.21**							
9. CEO Duality	.71	.46	.05	-.02	.11	.09	.17*	.17*	-.32**	.01						
10. CEO Stock Ownership	.40	1.24	.21**	-.13	.19*	.01	-.24**	-.16*	.28**	.10	.09					
11. CEO Fixed Salary	.20	.17	.18*	-.16*	.06	.00	-.10	.10	.10	.14	-.08	-.13				
12. CEO Tenure	7.46	6.52	.15*	-.05	.16*	.05	-.06	-.04	.13	-.03	.31**	.55**	-.11			
13. CEO Age	55.01	5.60	.00	.00	.12	.07	.07	.25**	-.10	-.02	.30**	.16*	-.08	.39**		
14. CEO Education	.74	.67	.04	-.08	.05	.06	.10	.10	.01	.05	.08	-.06	-.08	.00	.00	
15. CEO Directorship	1.07	.85	-.12	-.01	.10	-.03	.00	.18*	-.14	-.02	.29**	.04	-.08	.17*	.12	.12

** $p \leq .05$, ** $p \leq .01$ level, (N=162). Two tail test.*

In our logistic regressions, we included industry dummy variables and report the number of industry dummies that were significant (see Table 3). As a set of variables, industry dummies were barely significant. For all of our models, inclusion of industry dummies did not change the sign or significance of our findings with respect to our hypotheses. But inclusion of industry dummies did increase multicollinearity and reduce our models' degrees of freedom. So we include in our reported tables models that use industry dummies parsimoniously. Our results tables include model fit, incremental model improvement, coefficient estimates, standard errors, and significance levels. Our final model for each sample includes marginal effects following Wiersema and Bowen (2009).

5. Results

Table 3 shows the results of our logistic regression analysis. We show five hierarchical models. The first model contains only the control variables. The second adds variables related to board and ownership characteristics. The third adds CEO power variables. The fourth adds variables related to CEO motivation and the hypotheses. The fifth includes an interaction term for CEO education and CEO duality. Interestingly, the addition of the variables related to board and ownership characteristics in model 2 did not significantly increase the model's explanatory power. Models 3, 4, and 5 significantly increased explanatory power, as shown by both the change in log likelihood statistic and the improvement in the percent correctly classified.

Marginal effects, the effect of a unit change in the independent variable on the dependent variable while holding the value of other variables fixed, were reported and used for our discussion. Wiersema and Bowen (2009) recommend that marginal effects be included in reported results. Here, marginal effects mirror the coefficient significance levels.

Table 3. Logistic Regression Analysis of Poison Pills

Variable	Model 1		Model 2		Model 3		Model 4		Model 5		Marginal Effect	
Constant	-0.13	(1.26)	-0.84	(3.54)	-2.14	(4.01)	-0.82	(4.52)	-1.11	(4.54)		
Prior ROA	3.74	(3.25)	2.59	(3.42)	2.84	(3.72)	3.69	(3.94)	2.70	(4.34)	0.53	(0.86)
Debt-to-Assets Ratio	2.19	(2.14)	1.95	(2.17)	0.92	(2.28)	1.75	(2.44)	1.40	(2.39)	0.28	(0.47)
Other provisions	0.40*	(0.18)	0.40*	(0.18)	0.49**	(0.19)	0.43*	(0.19)	0.45*	(0.20)	0.09*	(0.04)
Firm Size	-0.56***	(1.26)	-0.62***	(0.16)	-0.58***	(0.17)	-0.70***	(0.19)	-0.68***	(0.19)	-0.13***	(0.04)
Board Independence			1.94	(3.38)	1.92	(3.93)	1.56	(4.36)	1.32	(4.39)	0.26	(0.86)
Insider Shareholdings			-1.11	(1.35)	-2.37	(1.62)	-3.05†	(1.71)	-2.99†	(1.75)	-0.59†	(0.34)
5% Block holdings			-1.12	(1.38)	-1.73	(1.49)	-2.65	(1.61)	-3.02†	(1.65)	-0.60†	(0.32)
CEO duality					-0.03	(0.53)	0.18	(0.57)	0.29	(0.60)	0.06	(0.12)
CEO stock ownership					1.44†	(0.86)	1.66†	(0.86)	1.81*	(0.89)	0.36*	(0.17)
CEO fixed salary					3.01*	(1.37)	3.40*	(1.47)	3.98*	(1.56)	0.78*	(0.31)
CEO Tenure					0.04	(0.04)	0.06	(0.05)	0.06	(0.05)	0.01	(0.01)
CEO Age							0.00	(0.05)	0.00	(0.05)	0.00	(0.01)
CEO Business Education							0.63*	(0.35)	0.49†	(0.37)	0.10†	(0.07)
CEO Directorship							-0.78**	(0.32)	-0.76**	(0.31)	-0.15**	(0.06)
CEO Business Education X Duality									1.86*	(0.84)	0.37*	(0.17)
# Industry Dummy Variables (significant at p<.05)	1		1		0		0		1		2	
Pseudo R-Square	.21		.22		.27		.32		.34			
Changes in χ^2 from previous model			2.00		11.54*		10.27*		5.13*			
Correctly classified	73.5%		69.8%		74.1%		76.5%		80.2%			
Probability > χ^2	p<.001		p<.01		p<.001		p<.001		p<.001			

†p≤.10, * p ≤ .05, ** p ≤ .01, *** p ≤ .001. Two-tailed test for controls and one-tailed test for independent variable (hypotheses are directional). Standard errors are in parentheses. Dependent variable is the use of poison pill, (N =162). Individual industry dummy variables are not reported for parsimony and marginal effect is based on Model 5.

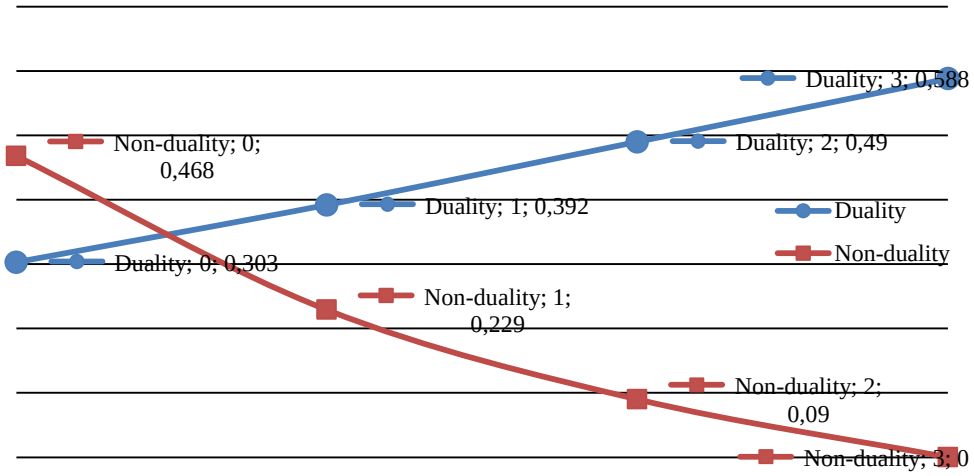
For the control variables, there were six variables with some statistical significance. Large firms were less likely to use poison pill ($p \leq 0.001$), whereas firms with other antitakeover provisions besides poison pill were more likely to use it ($p \leq 0.05$). For the CEO variables, CEO stock ownership ($p \leq 0.05$), and CEO fixed salary ($p \leq 0.05$) were positively associated with their firms' use of poison pills. At the 10% significance level, 5% blockholdings and insider shareholdings were negatively associated with poison pills. The 5% blockholdings, insider shareholdings and CEO fixed salary findings were consistent with the idea that effective corporate governance reduces the poison pill use.

Our model found no support for a relationship between CEO age and firms' poison pill use (Hypothesis 1). To investigate further, we tested for curvilinear relationships using the square of CEO age, and a variable for CEO above age 65. In both cases we found no effect. We found marginal support for Hypotheses 2. There is a positive relationship between CEO business education and their firms' use of poison pill ($p \leq 0.10$). Consistent with Hypothesis 3, we found the negative effect of CEO outside directorships and poison pill use ($p \leq 0.01$).

We also found support for hypothesis 4b, the interaction effect of CEO duality and business education background on poison pills. In order to test Hypotheses 4a, 4b, and 4c, we used a number of models that included terms that were the product of centered variables. We also tested the other interactions of CEO power besides duality (stock ownership, and tenure) and CEO motivation (age, business education, and directorships); however, we did not find any significant relationships besides the reported one.

Because the interpretation of interaction in logistic regressions is different from in OLS procedures (Hoetker, 2007), we calculated the probability of poison pill use (see Wiersema and Bowen, 2009; Appendix, pp. 690 for details) with the statistical package STATA and graphed it (see Figure 1). CEOs with duality are likely to use poison pills whereas CEOs with non-duality show the opposite pattern. This finding is consistent with Hypothesis 4b.

Figure 1. Probability of Poison Pill Use: Interaction Effect



Causality is one concern of our analysis that we addressed with further analysis. Our theory assumes that CEOs have significant influence on their firms' poison pill policies. We collected CEO variables for the years just preceding 2007 in order to meet the assumptions of regression modeling. However, it is also possible that CEOs with particular characteristics could be attracted to firms either with or without poison pills, or that firms first implemented their poison pill policies in order to attract specific types of CEOs. To control for this source of endogeneity, we analyzed a subset of our sample. In 2006, there were 81 of our 162 firms with poison pills. In 2007, there were only 58. From 2006 to 2007, 23 firms dropped their poison pill provisions, and no firm adopted, which reflects the prevailing negative attitude towards poison pills. Using the 81 firms that had poison pills in 2006 as the subsample, we applied our model to explain the difference between firms that kept their pills (n=58) and those that dropped (n=23). The dependent variable for our analysis is a dummy variable with a value of one for firms that kept their poison pills and zero for firms that dropped. Our results are shown in Table 4.

Table 4. Logistic Regression Analysis of Poison Pills: Subsample of Poison Pill Keepers (2006-2007)

Variable	Model 1		Model 2		Model 3		Model 4		Marginal Effect	
Constant	0.05	(1.25)	0.29	(5.67)	-1.61	(6.38)	0.75	(7.86)		
Prior ROA	9.02	(5.56)	12.34†	(6.31)	20.95*	(9.04)	21.44*	(10.80)	2.02*	(1.03)
Debt-to-Assets Ratio	5.84*	(2.90)	6.03†	(3.13)	5.97†	(3.40)	6.72†	(3.80)	0.63†	(0.39)
Other provisions	-0.10	(0.22)	-0.16	(0.24)	-0.15	(0.27)	-0.52	(0.33)	-0.05	(0.03)
Firm Size	-0.15	(0.21)	-0.08	(0.24)	-0.13	(0.25)	-0.47	(0.32)	-0.04	(0.03)
Board Independence			-2.22	(5.61)	-2.99	(6.18)	-6.10	(7.20)	-0.58	(0.70)
Insider Shareholdings			7.45*	(3.61)	5.67	(3.80)	5.20	(5.10)	0.49	(0.48)
5% Block holdings			1.14	(2.19)	-0.50	(2.42)	-3.14	(2.99)	-0.30	(0.27)
CEO duality					0.70	(0.69)	0.80	(0.87)	0.09	(0.11)
CEO stock ownership					1.45	(1.63)	1.92	(2.01)	0.18	(0.18)
CEO fixed salary					6.16*	(3.04)	10.55*	(4.37)	1.00**	(0.34)
CEO Tenure					0.04	(0.07)	0.12	(0.09)	0.01	(0.01)
CEO Age							0.03	(0.10)	0.00	(0.01)
CEO Business Education							1.39**	(0.56)	0.13*	(0.07)
CEO Directorship							-1.18**	(0.50)	-0.11*	(0.05)
Pseudo R-Square	.07		.15		.24		.37			
Changes in χ^2 from previous model			7.65*		8.54†		12.83**			
Correctly classified	71.6%		71.6%		77.8%		86.4%			
Probability > χ^2	p = 0.12		p<.05		p<.05		p<.001			

†p≤.10, * p ≤ .05, ** p ≤ .01. Two-tailed test for controls and one-tailed test for independent variable (hypotheses are directional). Standard errors are in parentheses. Dependent variable is to keep the poison pill in 2007. Sample is those firms that had poison pill in 2006 (N =81). Industry dummy variables, which were non-significant, are not included due to limited degrees of freedom. Marginal effect is based on Model 4.

This sample (N=81) was smaller than our full sample (N=162), which reduced the statistical power of our analysis. There were also some differences between the firms included in this subsample and those excluded. The subsample firms were smaller, had more other antitakeover provisions, and higher CEO stock ownership. And the subsample had lower variability in firm size, board independence, and insider shareholding. These differences suggest why the control variables in Table 4 were less significant than for Table 3. However, the subsample analyses were consistent with the results of analysis from our full sample with respect to the positive effect of CEO business education ($p \leq 0.01$) and the negative effect of CEO directorships ($p \leq 0.01$). Marginal effects supported these findings.

We also found no significant interaction effects in the subset. We do not know if this finding is due to low effect size or lack of statistical power. It is likely that limited degrees of freedom affected the model's statistical power to detect the interaction.

The results on Table 4 show strong effects for CEO business education and for CEO outside directorships. This finding supports hypotheses 2 and 3. We note that these results are only modest evidence regarding the causality issue, as it is still possible that boards of directors, not CEOs, drive the poison pill decision. However, addressing the issue of causality more fully would require a longitudinal research design or more access to micro-level intraorganizational information, which is beyond the scope of this study.

6. Discussion and Conclusion

This article investigates the relationship between CEO characteristics and their firms' use of poison pills for U.S. Fortune 500 manufacturing firms in 2007. The results demonstrate that poison pill use associated with CEOs' business education (+) and their number of outside directorships (-). We also found that CEO duality, or having the position or CEO and chair of the board, interacted with CEO education to significantly influence poison pill use. Figure 1 shows that the positive relationship between CEO business education and poison pill use only occurs in firms with CEO duality. The results suggest that CEOs' motivation matters in their efforts to implement their firms' poison pills. Our findings suggest that CEOs with more business-related degrees minimize the risk of job loss through poison pills. And this effect is greater when CEOs have the structural power in the organization. The findings update previous research on poison pill use, and are consistent with upper echelons theory (Hambrick and Mason, 1984) and social network theory (Adler and Kwon, 2002; Granovetter ,1983; Wasserman and Galaskiewicz, 1994).

Our study contributes to research on poison pills in a number of ways. First, we apply upper echelons theory by showing that the 'visible' attributes of CEOs are related to their firms' poison pill use. Business education and outside directorships are not directly related to corporate governance, nor are they characteristics of the firm. Rather, they are data that would normally be put in personal résumés. So our finding is that the CEO résumé matters.

Second, we apply social network theory and institutional theory to poison pill use. Consistent with the social network perspective, CEOs' role in the intercorporate social network, as indicated by their number of external directorships, may have more information about executive labor market and more opportunity to get other jobs from prestigious firms. This enhanced job mobility can reduce a) the perceived risk from job loss and b) motivation to use poison pills. Alternatively, consistent with institutional theory (e.g., DiMaggio and Powell, 1983), outside directorships may pressure CEOs to adopt other firms' managerial practices – in our study, not to use poison pills. CEOs serving multiple boards may be more likely to act in the perceived interests of shareholders because they understand the role and duty of the board consistent with prevailing norms. So there could be alternative and multiple causes for our finding regarding outside directorships. Our analyses highlight this new factor that associates with poison pill use.

And third, we extend the research on the characteristics of firms that use poison pills. Typical of research in corporate governance, there is focus on measures of power and influence for managers, board insiders, and shareholders. Our analyses suggest that these models are incomplete. An additional factor in poison pill use may be CEOs' personal desire for job security. This study is just a first step into this area, but our significant findings suggest that models of poison pill use can be better specified.

Our findings also suggest two practical implications. First, we find that CEOs' personal motivation, as measured by business education, and power, measured by duality, may jointly matter in corporate poison pill use. This finding suggests, consistent with agency theory (Eisenhardt, 1989; Fama and Jensen, 1983), that CEOs may influence poison pill policies for their personal benefit at the expense of shareholders. Therefore, effective board monitoring by shareholders may be advisable, and feasible, as these variables are readily available.

Second, our findings suggest implications for policy makers and regulators. If CEOs can dominate their organizations, policy makers and regulators may want to regulate poison pills. Other countries such as the U.K., France and Germany require majority shareholder approval for the adoption of poison pills while U.S. does not. It appears that the current trend against poison pill use is not sufficient to counter motivated and powerful CEOs c.

This study has a number of limitations and therefore opportunities for future research. First, our sample is limited to large *Fortune 500* manufacturing firms in the U.S., so the findings may only be generalized to other contexts by conjecture. Our approach can be extended by further study of other samples, such as small firms, non-manufacturing firms, and non-U.S. firms. Second, we used a cross-sectional sample, thus variable specifications are time-dependent. Third, we show that CEO characteristics associate with poison pill use, but we offer only weak evidence that CEOs cause changes in their firms' poison pill policies. Issues of causality and endogeneity are a major concern in upper echelons theory (Hambrick, 2007), and we only weakly account for these. Fourth, we limit our study to poison pills, but other antitakeover tactics, such as supermajority takeover approval, may associate with CEO power and preferences. Fifth, we limit our study to CEO characteristics, while it is possible that other top managers, or characteristics of the top management team, may influence poison pill use. Sixth, this study relies on the observable characteristics of CEOs that are available through secondary data sources. Some scholars (Carpenter *et al*., 2004; Lawrence, 1997) have criticized this approach using visible characteristics of top managers because they do not necessarily represent theoretical constructs such as value, cognition, and perspective. Future studies can be enriched by addressing these limitations, but as a result of our research, these follow-on studies should include an investigation of the personal and network characteristics of CEOs.

We have shown that CEO attributes matter with regard to firms' poison pill use. Our results show CEO education (+) and outside directorships (-) explain poison pill use, and that there is an interaction effect of CEO duality and business education. These results suggest that CEOs affect their firm's poison pill policies in predictable ways. We hope our article encourages others to explore the influence of résumé data on corporate governance decisions, thus expanding this stream of research.

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