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On the Use of Poison Pills and Defensive Payouts by Takeover Targets*

Using a large sample of unsolicited takeover attempts, we examine the determinants and effects of targets' choice to adopt poison pills either before or after unsolicited offers and to initiate defensive payouts. The probability of poison pill adoptions decreases with insider ownership, whereas the probability of defensive repurchases increases at a decreasing rate with insider ownership. Poison pills contribute to bid increases and higher bids, yet do not alter the likelihood of takeover. Defensive share repurchases slightly reduce the takeover likelihood but do not appear to harm shareholders, perhaps because they tend to fend off lowball bids or increase the firm's leverage.

I. Introduction

On August 4, 1998, Allied Signal announced a $44.50 per share unsolicited takeover offer for AMP Incorporated. Upon the announcement, the stock price of AMP increased by 49%, from $28.625 to $42.5625. AMP's management, armed with a poison pill plan and Pennsylvania antitakeover statutes, rejected the buyout offer. However, over the following few weeks, 72% of AMP's shareholders chose to tender their shares to Allied Signal rather than to give management the additional year it requested to turn around the company. Nevertheless, AMP's management continued its resistance. On September 18, 1998, AMP's management reduced the threshold on the firm's poison pill plan from 20% to 10%, thereby forcing Allied Signal to reduce the size of its initial tender offer to avoid triggering the poison pill. A few days later, on September 29, 1998, AMP announced a repurchase of up to 14% of its outstanding shares at a price of $55 per share. Although the repurchase price exceeded the $44.50 per share tender offer from Allied Signal by

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$10.50, the stock of AMP fell $2.1875 per share following the announcement, or 5.6%, presumably on fears that AMP would successfully fend off Allied's takeover offer.

Conventional wisdom based on the interpretation of announcement returns suggests that the nearly 6% decline in AMP's stock price at the announcement of its defensive share repurchase signaled that the defensive measure was merely entrenching the positions of managers and, as such, was not in the best interests of shareholders. However, such a conclusion would be premature, since the collective strategy afforded AMP the time to find another suitor, Tyco International, which paid $11.3 billion for AMP, roughly $1.3 billion more than Allied Signal's offer. Notwithstanding this favorable outcome for AMP shareholders, numerous shareholder activists and legal scholars criticized AMP's use of a restrictive poison pill plan and defensive repurchase prior to the resolution of the hostile takeover attempt.[1]

Over the past couple of decades, numerous corporate managers have employed firm-level defensive measures similar to those used by AMP to improve their bargaining power, thwart hostile takeover offers deemed to be inadequate, and, arguably in many cases, preserve their jobs at the expense of shareholders' wealth. Despite their widespread use, they remain very controversial because of disagreements among practitioners and researchers regarding their "true" effects on takeover contests and shareholder value.

This study furthers our understanding of the use and effect of poison pills and defensive payouts in response to takeover attempts in several ways. First, we use a sample and empirical test design that mitigates the endogeneity problem highlighted by Comment and Schwert (1995). Specifically, we study the effect of these defensive mechanisms on the final outcome for a sample of 526 unsolicited takeover attempts. The sample includes both successful and unsuccessful offers. Some of the firms had their takeover defenses already in place, others adopted their takeover defenses in response to the offer, and some did not employ these defenses. Thus the research design has significant power because all firms in the sample were targeted and because of the dispersion in the defensive measures used. Second, we consider financial, ownership, governance, and offer characteristics that affect both the decision to employ defensive mechanisms and other aspects of the takeover process. Many of these characteristics were ignored in past studies. Not only does this minimize omission bias that might be present in other studies, it also enriches our insight. For example, there is little evidence on the link between insider ownership and the decision to employ defensive payouts or poison pills,

1. One person in the top management team at AMP, Juergen Gromer, took a position at Tyco International as the president of Tyco Electronics. Robert Ripp, the chairman and chief executive officer of AMP, was expected to join Tyco's management team and board of directors but resigned after the merger with Tyco was completed. In the next year he became the chairman of LightPath Technologies and a director at Lightchip. No AMP director became a director at Tyco.

despite clear predictions about this link in the literature.[2] Third, we examine a much wider spectrum of measures for the outcome of the takeover process. For example, unlike Dann and DeAngelo (1988) and Denis (1990), we examine the effect of defensive payouts on takeover premiums and the stock returns during the takeover process. Further, while Comment and Schwert (1995) examine the effect of poison pills on the stock return during the takeover process, we also examine the effect on bid increases and total takeover premiums.

We first examine the choice to use defensive mechanisms in response to takeover attempts. Irrespective of whether poison pills are adopted before or after the takeover attempts, the probability that a firm will adopt a poison pill decreases with insider ownership, suggesting that firms are more likely to erect barriers when the bargaining power of the inside owners or their personal stakes in the firms are low. In contrast, the probability that a firm will employ a defensive repurchase increases at a decreasing rate with insider ownership. This provides direct evidence in support of Stulz's (1988) model, which shows that repurchases are more effective in fending off takeovers as insider ownership increases, until it is so high that the firm is effectively entrenched.

Next, we examine the effect of poison pills and defensive payouts on the takeover process. We find evidence that shareholders of targeted firms benefit from poison pills. In particular, poison pills do not reduce the likelihood of a takeover and are associated with both higher takeover premiums and higher shareholder gains. Further, shareholders benefit from the enhanced bargaining power provided by poison pills regardless of whether they were in place before the takeover attempt or adopted as "morning-after" pills once the firm has been targeted. One implication of our results is that the recent growth in opposition to poison pill defenses, such as that discussed in the March 2, 2004, *Wall Street Journal* article titled "Where Are All the Poison Pills?" is, on the whole, misguided. Specifically, the *WSJ* article notes that "In addition to yielding to shareholder pressure, deal makers say companies are dropping the takeover defense to win more favorable ratings from organizations that evaluate corporate governance; such groups typically give lower scores to companies with poison pills" (p. C1). Our results suggest that among the organizations that construct corporate governance ratings, those that routinely give lower scores to companies with poison pills should revisit the issue in light of the empirical evidence. Moreover, our evidence suggests that shareholders of firms that become takeover targets should encourage managers to adopt morning-after pills if they do not already have a poison pill defense in

2. Malatesta and Walkling (1988) provide univariate evidence that firms that adopt poison pills have lower insider ownership than other firms. Field and Karpoff (2002) examine the relation between inside ownership and the use of takeover defenses for a sample of initial public offering firms in a multivariate context. However, they examine only defenses that were in place before going public, and not those that might be adopted in response to a direct takeover threat, and they do not distinguish between various types of takeover defenses.

place because, on average, they benefit from management's ability to quickly enhance their bargaining position.

Finally, although defensive repurchases reduce the likelihood that a takeover will be successful and do not on average produce bid increases, they do not appear to harm shareholder wealth. There are two possibilities for this. First, our evidence shows that defensive repurchases are more likely to be implemented in response to offers with low initial premiums, which would generate less wealth for target shareholders anyway. Second, payouts leave the firms with higher leverage that could enhance value if the firms remain independent (Safieddine and Titman 1999).

The remainder of this paper proceeds as follows. Section II reviews the literature, and Section III discusses the sample selection and descriptive statistics. Section IV presents univariate comparisons. Section V presents the results from our multivariate empirical tests, and Section VI presents a conclusion.

II. Literature Review

The subject of takeover defenses has been a controversial one for decades, and it remains so today. What researchers generally agree on are the two alternative hypotheses regarding the effects of takeover defenses. The first alternative, frequently referred to as the managerial entrenchment hypothesis, suggests that managers adopt takeover defenses to preserve their high-paying jobs at the expense of shareholders. The second hypothesis, often termed the stockholder interests hypothesis, purports that takeover defenses on average increase shareholder wealth because they enhance management's ability to either extract higher premiums from legitimate acquirers or fend off inadequate offers (see DeAngelo and Rice [1983] and Linn and McConnell [1983] for further discussion). Despite the agreement on the underlying issue, researchers have arrived at different conclusions, often using similar methodologies and sample periods. For instance DeAngelo and Rice suggest that their evidence with regard to the wealth effects of antitakeover charter amendments provides more support for managerial entrenchment arguments, whereas Linn and McConnell conclude that their evidence lends more support to the stockholder interests hypothesis.

In comparison to antitakeover charter amendments that shareholders vote on, poison pills are even more controversial, largely because managers can adopt them *without* shareholder approval. Early studies of the effects of poison pills utilize event study methodology and report negative abnormal stock returns around the announcements of poison pill adoptions (Malatesta and Walkling 1988; Ryngaert 1988). However, Comment and Schwert (1995) argue that it is difficult to interpret announcement returns surrounding pill adoptions because they contain information about both (a) the net effects that pills have on the probability that a takeover succeeds and the eventual premium in a successful premium and (b) the probability of imminent takeover attempts

or the status of ongoing takeover negotiations. For example, a pill announcement during merger negotiations "is tantamount to a disclosure of the bad news that a deal has yet to be struck, so a decline in stock price does not necessarily imply deterrence" (19). Comment and Schwert further suggest that perhaps "the market misestimated the eventual effect of pills and laws, overestimating the costs of deterrence and underestimating the benefits of added bargaining power" (38), which could explain the negative poison pill announcement returns in earlier studies.

To provide more direct evidence on the deterrent effect of poison pills, Comment and Schwert relate the use of poison pills to the takeover rate for all exchange-listed firms during 1975–91. Because companies might adopt poison pills when takeover attempts are imminent, giving rise to endogeneity problems, they incorporate a proxy for the "surprise content" in poison pill adoptions. Their evidence suggests that poison pills do not materially deter takeovers. They also report evidence that poison pills enhance shareholder gains in successful takeovers, suggesting that poison pills benefit shareholders. In somewhat of a contrast, Field and Karpoff (2002) report that the presence of takeover defenses, including poison pills, when a firm goes public reduces the likelihood of a subsequent takeover and does not affect the takeover premium for those that are acquired.

Coates (2000) contends that the extant empirical evidence on the effects of poison pills is weak and inconsistent because poison pills can be quickly and inexpensively adopted, such that all firms effectively have latent or "shadow" pills. Because target boards can also easily redeem poison pills, Bebchuk, Coates, and Subramanian (2002) argue that poison pills are most effective when combined with an "effective" staggered board, which forces the bidder to go through at least two proxy contests to gain control of the board and redeem the pill. While they do not test the interaction effect between poison pills and staggered boards directly, they do report that the takeover likelihood is significantly lower and that shareholder returns are insignificantly lower for target firms with effective staggered boards.[3] Finally, Danielson and Karpoff (2006) report that operating performance improves slightly after poison pill adoptions, which is not consistent with the notion that poison pills entrench managers.

The literature relating to defensive payouts is not as broad, perhaps because defensive payouts are less controversial or because they are relatively infrequent compared to poison pill adoptions. Dann and DeAngelo (1988) find that the bidder did not gain control after any of the eight stock repurchases in their sample of defensive restructurings, and Denis (1990) reports that the majority of firms that announce defensive payouts successfully thwart the takeover efforts. Denis further finds negative returns around the announce-

3. Bebchuk et al. are unable to test the interaction effect of poison pills and staggered boards on the takeover process, because poison pills were in place before or adopted quickly after all the 92 hostile bids in their sample. Thus it is unclear from their study what effect staggered boards would have in the absence of poison pills.

ments of defensive payouts that are preceded by takeover activity. Collectively, one might interpret these results as evidence that managers use defensive payouts to entrench themselves at the expense of shareholders. However, neither of these studies controls for other determinants of the final outcome. For example, defensive payouts might be implemented in response to offers that managers believe have inadequate premiums. Such offers are less likely to succeed even in the absence of a defensive payout, and defensive payouts might induce improvements in the terms for those that do succeed. Furthermore, defensive payouts represent financial restructurings that often lead to significant increases in shareholder value due to benefits associated with increased debt utilization. Thus they are typically associated with subsequent improvements in operating performance and stock returns in firms that remain independent (Safieddine and Titman 1999). Finally, as argued by Comment and Schwert (1995), it is difficult to separate deterrence and information effects in the stock price reaction to announcements of defensive mechanisms, even when these announcements occur after the offers have been made (see the analogous discussion above on poison pills). The Allied Signal–AMP corporate control contest discussed at the beginning of this study illustrates this point further.

The review of the literature relating to the effects of both poison pills and defensive payouts reveals that it is mixed in the case of poison pills and inconclusive in the case of defensive payouts. Our aim with this study is to resolve some of the controversy and unanswered questions through a comprehensive analysis of the characteristics of companies that employ these defenses, how these defenses affect takeover likelihood, how they affect shareholder premiums, and how they affect the returns that shareholders earn at least through the resolution of the takeover contest.

III. Sample

Our sample is drawn from the Securities Data Company (SDC) Mergers and Acquisitions database and consists of 526 unsolicited acquisition attempts announced between 1985 and 1998. We define unsolicited takeover attempts as those attempts classified as hostile or otherwise unsolicited in the SDC database. By definition, all hostile takeovers are unsolicited, but the reverse is not always true. As Schwert (2000) points out, there is no consensus regarding how to define hostile takeovers. Thus he cautions researchers and practitioners about attempting to draw distinctions between hostile and nonhostile offers. For instance, Schwert suggests that the publicity surrounding the bargaining process plays a large role determining whether a takeover attempt is classified as hostile, even if managers are simply negotiating in a strategic manner, as opposed to attempting to entrench themselves. In this study we focus on the strategic role that poison pills and defensive payouts play in the bargaining process surrounding unsolicited offers, regardless of

whether the publicity of the negotiation process might prompt some observers to classify specific unsolicited bids as hostile.

We believe that our sample of unsolicited takeover attempts is well suited to examine the choice to use defensive measures and their effect on the takeover process. Dann and DeAngelo (1988) and Denis (1990) use samples based on hostile tender offers classified as contested. The exclusion of uncontested offers prevents them from analyzing the choice to resort to defensive mechanisms versus not fighting the takeover attempt. Comment and Schwert (1995) use all takeover attempts (including merger proposals and agreements), irrespective of whether they are solicited or unsolicited. Because poison pills are unlikely to be used in solicited offers, their results might not fully reveal the effect of poison pills.

Because our tests rely on financial data, we require the sample firms to be covered by the Center for Research in Security Prices and Compustat. We identified the adoption dates of any poison pills for the sample firms by searching various editions of the Clark Boardman publication titled *Corporate Anti-takeover Defenses: The Poison Pill Device* (1988–98) and Dow Jones News Retrieval. Further, we identified defensive payouts by searching the SDC database and Dow Jones News Retrieval. Finally, we gathered information on CEO compensation, board composition and structure, and ownership by officers and directors from proxy statements immediately preceding the takeover attempts.

Table 1 provides descriptive statistics for the sample. The mean and median market values of equity, determined 20 days prior to the announcement of the takeover attempts, are $794 million and $150 million, respectively. The mean and median total debt ratios of 56%–58% are virtually identical to those for respective industry norms, defined as the median for firms in the same two-digit Standard Industrial Classification (SIC) as each target firm. Market-to-book ratios average 1.29, with a median of 1.10; both are significantly lower than the mean of 1.35 and median of 1.25 for the industry norms (p-values < 0.05). Mean and median insider ownership levels are 12.4% and 8.0%, respectively. The operating performance of the targeted firms compares favorably to that of industry peers. Mean and median industry-adjusted operating performance (defined as operating income scaled by assets) levels are 1.80% and 1.75%, respectively. The mean stock return earned by the targeted firms' shareholders in the year prior to the takeover offer is 10.0%, with a median of 4.6%. Initial premiums offered to shareholders (relative to the stock price 20 days prior to the announcement of the offer) average 40%. Target firms received increased bid prices in 229 of the 526 offers (44% of the sample), and the mean increase in bid price is 9.7%. Not unexpectedly for a sample of unsolicited takeover attempts, the sample includes a very high proportion of cash offers: 385 out of the 526 offers were 100% cash offers, and the mean proportion of cash across the entire sample is 85%.

Targeted firms had poison pills in place before 208 of the takeover an-

TABLE 1 Descriptive Statistics: 526 Unsolicited Takeover Targets, 1985–98

	A.	
	Mean	Median
Market value of equity	$794 million	$150 million
Total liabilities/assets	56.44%	57.70%
Cash/assets	9.84%	5.30%
Pension overfund $/assets	1.14%	0%
Market-to-book assets	1.29	1.10
Insider ownership	12.42%	8.00%
CEO compensation	$542,201	$370,173
Fraction of outside directors	53.60%	56.00%
Industry-adjusted OIBD	1.80%	1.75%
Stock return for prior year	9.99%	4.62%
Premium offered	39.77%	37.74%
Premium increase	9.66%	0%
Proportion of cash in offer	84.96%	100%

	B.	
	Number	Fraction
Targets with existing poison pills	208	39.54%
Targets that adopted morning-after pills	89	16.92%
Targets with defensive payouts	50	9.51%
Defensive special dividend	11	2.09%
Defensive share repurchase	39	7.41%
Staggered board	276	51.71%
CEO = chairperson of board	322	61.22%
Pill and staggered board	125	33.27%
Contests with multiple bidders	225	42.78%
Completed offers	110	20.91%
Targets that survived less than 1 year after offer	256	48.67%
Targets that survived less than 2 years after offer	307	58.37%
Targets that survived less than 3 years after offer	330	62.74%
Acquired within 3 years, no white knight	267	50.76%

NOTE.—Figures derived from financial statements pertain to the fiscal year preceding the announcement of the takeover attempt, unless otherwise indicated. Equity market values are as of 20 days prior to the announcement of the takeover attempt. Information pertaining to insider ownership, CEO compensation, and the board of directors comes from the most recent proxy statement prior to the announced takeover attempt. CEO compensation is the sum of the CEO's salary plus cash bonus for the year prior to the takeover announcement. Industry-adjusted OIBD (operating income before depreciation) is the paired difference between operating income/assets for the sample firm and the median figure for firms with the same two-digit SIC code. Stock return for prior year is the cumulative stock return over the year ending 20 days prior to the announcement date of the takeover attempt. Premium offered is the initial offer price divided by the price 20 days prior, less one. Premium increase is the percentage increase in the bid price, relative to the price 20 days prior to the initial offer. Completed offers are those that were completed without ever having been withdrawn. The survivability rates reflect the percentage of firms that ceased to exist as a public corporation for windows spanning one, two, and three years after the takeover offer. As is discussed further in the text, most of the firms that did not survive were acquired in some fashion, although some ultimately went bankrupt.

nouncements and announced morning-after pills (defined as a poison pill adopted after the takeover attempt was announced but before the outcome was determined) in 89 contests. Fifty of the targeted firms announced a defensive payout in response to the takeover offer. Of the defensive payout announcements, 11 were special dividends and 39 were share repurchases (paid for by cash, debt, or both).[4] Slightly over half of the sample firms (52%)

4. Following Denis (1990), we include exchange offers of debt or debt and cash for equity in our definition of share repurchases and excluded targeted repurchases (i.e., greenmail).

had staggered boards in place, and one-third of the firms had both a poison pill and a staggered board—a combination that Bebchuk et al. (2002) argue forms a particularly powerful antitakeover defense. Multiple bidders were involved in 225 contests (43%). One hundred and ten (21%) of the takeover attempts succeeded without the offer ever having been withdrawn by the original bidder. However, public survivability rates for the targeted firms over windows spanning up to three years after the initial takeover attempt are much lower than what the above figure might suggest because of the possibility of multiple bidders, subsequent bids made by other firms or by the original bidder in another attempt, going private transactions, and bankruptcies. Specifically, once targeted, nearly half (49%) of the firms did not survive publicly for one full year (249 of 526 were acquired and seven were delisted because of bankruptcy). Over a three-year window subsequent to the takeover attempt, 330 of the 526 firms (63%) did not survive as a public firm because they were acquired by another public company, taken private, or delisted for other reasons such as bankruptcy. Within three years after the initial takeover attempt, 51% of the sample firms were acquired by another firm that was not considered to be a white knight. Thus it is apparent that the long-term survivability rate for firms targeted in our sample is relatively low, even if they were initially successful in fending off the unsolicited bidder.

IV. Univariate Comparisons

Table 2 provides a further decomposition of the sample along two dimensions: the first according to whether the takeover offer succeeded without ever having been withdrawn and the second according to whether the target employed a poison pill plan and/or a defensive payout. The comparison of successful versus unsuccessful offers reveals that market-to-book ratios and industry-adjusted operating performance are significantly higher (in terms of both means and medians) for successful offers. In contrast, both mean and median insider ownership figures are significantly lower for successful offers. The difference in shareholder premiums between successful versus unsuccessful offers is particularly noteworthy. Initial premiums for successful offers are roughly 7% higher in terms of means (45.15% vs. 38.34%) and 5% higher in terms of medians (41.92% vs. 36.50%). The same is true for premium increases, where the mean premium increase for successful offers is roughly 11% higher than the comparable figure for unsuccessful offers (18.59% vs. 7.30%). Total premiums (the sum of the initial premium offered and the premium increase) for successful offers are nearly 18% higher in terms of means (63.74% vs. 45.64%) and 17% higher in terms of medians (59.26% vs. 42.86%). All the above noted differences in initial premiums, premium increases, and total premiums are significant at the 5% level or better. Although the figures are not significantly different from each other, targets of successful offers had a slightly higher incidence of poison pill plans in place prior to

TABLE 2 Univariate Comparisons

	Successful Offers		Unsuccessful Offers		Firms without Poison Pills or Defensive Payouts		Firms with Poison Pills and/or Defensive Payouts	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Market value of equity	$874 million	$243 million*	$773 million	$131 million	$295 million*	$72 million*	$1,142 million	$221 million
Total liabilities/assets	54.92%	55.70%	56.85%	58.10%	56.46%	57.75%	56.43%	57.25%
Cash/assets	11.0%	7.7%	9.5%	5.1%	10.4%	5.9%	9.5%	4.7%
Pension overfund $/assets	.70%	0%	1.25%	0%	.90%	0%	1.31%	0%
Market-to-book assets	1.42*	1.16*	1.25	1.07	1.22*	1.04*	1.34	1.17
Insider ownership	9.46%*	5%*	13.21%	8.5%	17.53%*	11%*	8.87%	6%
CEO compensation	$570,331	$519,399*	$534,763	$342,232	$415,935*	$285,448*	$630,180	$453,012
Fraction of outside directors	55.62%	58%	53.06%	56%	50.50%*	50%*	55.75%	60%
Industry-adjusted OIBD	3.45%*	2.70%*	1.36%	1.40%	.45%*	.40%*	2.74%	2.15%
Stock return for prior year	4.90%	1.02%	11.34%	5.21%	10.39%	4.73%	9.72%	4.15%
Premium offered	45.15%*	41.92%*	38.34%	36.50%	39.97%	35.52%	39.62%	38.46%
Premium increase	18.59%*	15.41%*	7.30%	0%	6.26%*	0%*	12.04%	2.02%
Total premium	63.74%*	59.26%*	45.64%	42.86%	46.23%*	43%*	51.66%	49.17%
Proportion of cash in offer	86.95%	100%	84.44%	100%	84.51%	100%	85.28%	100%
Existing poison pills	46.36%	. . .	37.74%	. . .	. . .	. . .	67.10%	. . .
Morning-after pills	19.09%	. . .	16.35%	. . .	. . .	. . .	28.71%	. . .
Defensive special dividend	1.82%	. . .	2.16%	. . .	. . .	. . .	3.55%	. . .
Defensive share repurchase	4.55%	. . .	8.17%	. . .	. . .	. . .	12.58%	. . .
Staggered board	48.18%	. . .	52.64%	. . .	42.13%*	. . .	58.39%	. . .
CEO = chairperson of board	67.27%	. . .	59.62%	. . .	55.56%*	. . .	65.16%	. . .
Pill and staggered board	36.36%	. . .	32.45%	. . .	. . .	. . .	56.45%	. . .
Contests with multiple bidders	35.45%	. . .	44.71%	. . .	44.44	. . .	41.61%	. . .

NOTE.—The sample is broken down according to offer success and whether the targeted firm employed a poison pill and/or a defensive payout. Successful offers are those in which the target was acquired without the takeover offer ever having been withdrawn. Total premium is the sum of premium offered and premium increase. See also the note to table 1.

* The mean and median differences across categories are statistically significant at the 5% level or better.

the offer (46% vs. 38%) and were more likely to adopt morning-after pills in response to the takeover attempt (19% vs. 16%).

The univariate comparison of targets that utilized poison pill plans, defensive payouts, or both, with the remainder of the firms targeted for takeover, reveals significant differences along several dimensions. Firms with neither defense in place are significantly smaller in terms of both mean and median equity values (p-values $< .01$) and have significantly higher levels of insider ownership (p-values $< .01$). The mean and median insider ownership levels for firms that did not use the defenses are 17.53% and 11%, whereas the corresponding figures for firms that utilized the defenses are 8.87% and 6%, respectively. Interestingly, the collective group of firms that employed a poison pill, a defensive payout, or both had significantly higher mean and median proportions of outside board members (p-values $< .01$) and also exhibited higher levels of industry-adjusted operating performance (p-values $< .01$) in the year prior to their attempted takeover. Although initial premiums offered do not statistically differ between the firms that used the defenses and those that did not, premium increases and total premiums are significantly higher for the firms that used poison pills, defensive payouts, or both (p-values $< .05$). On average, firms with poison pills and/or defensive payouts were offered total premiums that exceeded those offered to firms lacking such defenses by approximately 6%.

The univariate comparisons made so far do not lend support to arguments that poison pills and defensive payouts are used to entrench managers at the expense of shareholders. Instead, at least with respect to poison pills, the firms in our sample that were successfully acquired were more likely to have a poison pill in place prior to the acquisition attempt or otherwise adopt morning-after pills in response to the bid. Moreover, our findings that the aggregate population of firms that adopted either poison pills or defensive payouts have higher fractions of outside board representation, higher market-to-book ratios, and better industry-adjusted operating performance and that they received larger premium increases and total premiums than firms without such protections seem inconsistent with the notion that their intended purpose is to entrench incumbent managers. We pursue these issues further in a more refined multivariate setting in our subsequent tests.

Although often overlooked in studies of takeover defenses, the univariate comparisons suggest that insider ownership levels play a material role in the decision to employ takeover defenses. Obviously, if insider ownership levels are high enough to effectively thwart unsolicited takeovers, defensive mechanisms are unnecessary. As further evidence in this regard, among those 16 firms in the sample in which insider ownership exceeded 50%, thereby ruling out the possibility of a hostile takeover, none employed a poison pill or a defensive payout. We expand on the relationship between insider ownership and the choice to adopt defensive mechanisms in the following multivariate framework.

V. Multivariate Empirical Tests

A. Determinants of Defensive Responses to Takeover Attempts

The decision by a target firm's management to respond defensively to an unsolicited takeover offer likely depends on a host of factors, including the consequence of a takeover for incumbent management, the premium offered to shareholders, management's assessment of firm value, and the target's bargaining power and ability to resort to defensive techniques. In this section, we examine the choice to adopt poison pills or undertake defensive payouts. Although the purpose of both defensive mechanisms is to enhance management's bargaining power, their determinants and effects might differ, so we study them separately.

Harford (1999) and Pinkowitz (1999) report that firms with excess cash are less likely to become takeover targets.[5] Both authors suggest that these results arise because firms with excess cash have the financial flexibility to deter takeovers through the use of defensive payouts. Consequently, we conjecture that the probability that target firms will initiate defensive payouts increases with excess cash levels. Further, because excess debt capacity might act as a substitute for excess cash, we conjecture that the probability of a defensive payout decreases with the debt ratio. Moreover, because Mitchell and Mulherin (1989) and Petersen (1992) show that overfunded defined benefit pension plans can be used by corporate raiders to finance takeover attempts or by the firm's existing management to pay for defensive payouts designed to thwart unsolicited takeovers, we also include the extent of pension overfunding scaled by total assets as a measure of financial flexibility.

Mikkelson and Partch (1989) and Cotter and Zenner (1994) report that the probability that a target rejects an offer is negatively related to insider holdings. One interpretation is that managers are more inclined to support a takeover when their financial benefits are large, as would be the case when their personal shareholdings are sizable. Hence, we expect that firms are more likely to initiate defensive mechanisms when their insider holdings are low.

However, the relation between insider holdings and the use of defensive payouts might differ from that between insider holdings and other defensive mechanisms. In Stulz's (1988) model, repurchases can be used to entrench the firm because they remove outstanding shares, thereby effectively increasing the fraction of shares held by managers. Under the assumption that managers do not sell shares, the deterrent effect of a defensive share repurchase is weak for low levels of insider holdings. But the effect increases as insider

5. Although they are not reported in a table, we confirm these results. In particular, we first assembled a sample of control firms with size and industry characteristics similar to those of the target firms. Next, we estimate logistic regressions of the probability that firms were targeted using firm size, profitability, market-to-book value of assets, leverage, and excess cash as independent variables; the excess cash was estimated as explained in n. 7. As in Harford (1999) and Pinkowitz (1999), the probability of being targeted decreases with the market-to-book ratio of assets and with the excess cash ratio. None of the other control variables was statistically significant at conventional levels.

holdings get larger, because insiders' incremental change in voting power increases with the level of their holdings prior to the repurchase.[6] However, if the fraction of insider holdings is sufficiently large (i.e., large enough that it makes the firm immune to unwanted takeovers), managers have no incentive to conduct a defensive share repurchase. This line of reasoning implies that the probability of a defensive payout should increase at a decreasing rate with insider holdings.

B. Probability of Poison Pill Adoption

Table 3 presents logistic regressions of the probability that takeover targets had poison pills in place prior to the takeover attempt announcements based on the entire sample (model a) or the probability that targets adopted a "morning-after" poison pill in direct response to the takeover attempts based on the 318 targets with no poison pill at the takeover announcement (model b). Both models include as independent variables the market value of equity, the debt ratio, an excess cash measure,[7] a measure of pension plan overfunding,[8] the market-to-book ratio, insider ownership, board of director characteristics, CEO compensation levels, industry-adjusted operating performance, stock price performance for the prior year, and indicator variables representing the use of a defensive special dividend or share repurchase.[9] In addition, model b includes the initial takeover premium and the proportion of cash in the takeover offer. We do not include these two variables in model a since they are revealed at

6. For example, if the firm repurchases half of its shares, the fraction of insider holdings will double provided that insiders do not sell their shares. This doubling will have a more significant impact on voting control if insider holdings prior to the repurchase are 20% rather than 1%. For instance, consider insiders of two firms (A and B) that conduct defensive self-tender offers to repurchase half of their firm's outstanding shares (managers do not participate in the repurchase). If insiders in firm A held 1% of the outstanding shares prior to the share repurchase, their holdings would increase to 2% afterward. Although their relative voting control has doubled, it would have a small effect on their ability to block a takeover on the basis of voting power. In contrast, suppose that insiders in firm B held 20% of the firm's outstanding shares prior to the share repurchase. Subsequent to the repurchase, their voting block would have doubled to 40% of the total shares outstanding, making it very unlikely for a hostile takeover to succeed.

7. As in Harford (1999) and Pinkowitz (1999), we estimate excess cash ratios with a two-step procedure. First, using the universe of Compustat firms, we regress individual firms' cash ratios against their cash flow scaled by book value of assets, market-to-book ratio, natural logarithm of book value of assets, standard deviation of cash flows for firms with the same two-digit primary SIC code, total debt scaled by book value of assets, R&D expenses scaled by book value of assets, an indicator variable for financial firms, and an indicator variable for utilities. Second, we estimate excess cash ratios as the difference between actual cash ratios and predicted cash ratios based on the estimated regression coefficients.

8. For firms with defined benefit pension plans, the dollar amount of pension overfunding is the difference between the present value of all pension plan assets and the present value of all pension plan obligations. If the plan's assets exceed the obligations, the pension is overfunded; if the plan's assets are less than the obligations, the pension is underfunded. In order to make our measure comparable across firms, we scale the dollar amount of pension over- (or under-) funding by the firm's total assets. For firms without defined contribution plans, this variable takes on a value of zero.

9. To mitigate the influence of outliers, we estimate all regression models with the continuous variables winsorized at the fifth and ninety-fifth percentiles. In all instances, we obtain virtually identical results if we use unwinsorized data.

TABLE 3 Probability That the Targets Adopt Poison Pills

	Model a		Model b	
	Coefficient	*p*-Value	Coefficient	*p*-Value
Intercept	−13.129	.001	−7.702	.025
Log of equity market value	.171	.111	−.204	.177
Total liabilities/assets	−.468	.443	−.560	.474
Excess cash/assets	−3.738	.004	1.370	.399
Pension overfund $/assets	−7.151	.092	1.414	.798
Market-to-book assets	.216	.536	1.169	.010
Special dividend	.848	.239	1.879	.147
Share repurchase	.346	.369	.150	.799
Insider ownership	−2.943	.007	−3.467	.010
Staggered board	.531	.010	.650	.021
Log of CEO compensation	.838	.000	.551	.089
Fraction of outside directors	.084	.881	1.189	.107
CEO = chairperson of board	−.423	.056	.217	.482
Industry-adjusted OIBD	1.391	.494	.464	.855
Stock return for prior year	−.809	.021	.369	.441
Premium offered (%)			.767	.246
Proportion of cash in offer			.041	.926
Observations	526		318	
Likelihood ratio statistic	106.93	.000	35.92	.003
Likelihood ratio index	15.15%		9.53%	

NOTE.—Logistic regressions of the probability that the takeover targets had a poison pill prior to the takeover attempt (model a) and of the probability that the target adopts a poison pill after a takeover attempt is announced, but before the outcome is determined (model b). The estimation of excess cash is explained in n. 7. Special dividend is an indicator variable equal to one if the target declared a special dividend in response to the takeover attempt, zero otherwise. Share repurchase is an indicator variable equal to one if the target firm announced a share repurchase in response to the takeover attempt, zero otherwise. Insider ownership figures represent the fractional ownership of officers and directors (taken from proxy statements). Staggered board is an indicator variable equal to one if the target had a staggered board, zero otherwise. The likelihood ratio index is defined as [1 − (log likelihood at convergence)/(log likelihood at zero)]. It is similar to the R^2 statistic for a multiple linear regression. See also the note to table 1.

the announcement of the offer and thus have no bearing on the decision to adopt a poison pill *before* the offer.

In model a, the coefficients on the excess cash ratio and insider ownership are negative and significantly different from zero. Thus firms with poison pills in place before the takeover announcement tend to have lower levels of cash and insider ownership. One interpretation is that firms are more likely to proactively adopt poison pill plans when their financial and ownership characteristics do not provide managers with a strong bargaining position in the event that the firm becomes a takeover target. An alternative interpretation is that managers of firms with poison pills allow levels of cash and insider ownership to decline in the comfort that the pill will provide sufficient protection from inadequate takeover overtures. The negative coefficient on the prior year's stock return might reflect a propensity for firms to adopt takeover defenses when recently poor stock price performance has increased their vulnerability to takeover attempts. There are significantly positive coefficients on the staggered board indicator variable and the CEO compensation variable. As discussed earlier, the effectiveness of poison pill plans is enhanced when the firm also has a staggered board of directors. An agency cost–based in-

terpretation of the positive coefficient on the CEO compensation variable would be that CEOs are more likely to adopt takeover defenses such as poison pills out of their own self-interests when their salaries are larger. We rely on subsequent multivariate tests for further guidance on this issue.

The coefficient on the insider ownership variable in model b is also significantly negative, suggesting that target firms are more likely to adopt poison pills in direct response to attempted takeovers when insider ownership is low. Our interpretation for this result and its persistence across both models is that managers seek to strengthen their bargaining position via poison pills when their bargaining position arising from their ownership is weak, as in Stulz's (1988) model. Another explanation is that managers are more likely to fight takeover attempts with poison pills when their financial reward in the form of the total dollar premium on their shares is low. However, our later results lend little credence to this second explanation, since poison pills appear to primarily raise premiums and do not obstruct the takeover attempts. Moreover, although we do not tabulate the results, we estimated abnormal returns over the interval from minus one to plus one surrounding 81 morning-after poison pill adoptions that did not coincide with the announcement of the takeover attempt. Although the average abnormal return of 0.59% does not statistically differ from zero, it does contrast with the negative reactions found by prior studies when poison pills are adopted in the midst of corporate control contests (see, e.g., Malatesta and Walkling 1988; Ryngaert 1988; Comment and Schwert 1995). Although statistically insignificant, the positive stock price reaction indicates that the initially negative perception of poison pills has disappeared in later samples as more direct evidence regarding their true effects becomes available.[10]

The coefficient on the staggered board indicator variable is once again significantly positive, suggesting that staggered boards and poison pills are complementary. As discussed earlier, Bebchuk et al. (2002) provide a specific explanation for how poison pills and staggered boards complement each other: poison pills are more effective when staggered boards prevent them from being redeemed in the short run. Finally, the coefficient on the market-to-book ratio is significantly positive. One possibility for this result is that managers find it relatively more appealing to use repurchases to fend off takeovers when the market-to-book ratio is low (see further discussion below on the use of defensive payouts).

C. Probability of Defensive Payouts

Table 4 presents logistic regressions of the probability that a targeted firm initiates a defensive payout. The dependent variable in model a equals one

10. We also estimated cross-sectional regressions of the abnormal returns at the announcement of morning-after pills on the firm's characteristic, offer characteristic, and governance structure variables that we use as independent variables in our other cross-sectional tests. Because these regressions did not explain enough of the variation in abnormal returns to meet conventional levels of statistical significance, we do not tabulate the results.

TABLE 4 Probability That the Targets Announce Defensive Payouts

	Model a		Model b		Model c	
	Coefficient	*p*-Value	Coefficient	*p*-Value	Coefficient	*p*-Value
Intercept	−14.211	.002	−11.135	.028	−11.980	.021
Log of equity market value	1.254	.000	1.197	.000	1.174	.000
Total liabilities/assets	−2.435	.047	−2.190	.104	−2.573	.063
Excess cash/assets	3.559	.130	7.210	.006	7.096	.007
Pension overfund $/assets	23.303	.000	28.968	.000	28.920	.000
Market-to-book assets	−2.596	.000	−2.987	.000	−3.099	.000
Existing poison pill	.624	.165	.307	.522	.422	.394
Morning-after pill	.610	.275	.227	.712	.372	.553
Insider ownership	18.139	.003	21.693	.003	20.563	.005
Insider ownership^2	−36.366	.021	−53.666	.013	−49.575	.020
Staggered board	.512	.171	.396	.339	.471	.265
Log of CEO compensation	−.114	.774	−.198	.656	−.094	.836
Fraction of outside directors	−3.415	.001	−3.862	.001	−3.624	.002
CEO = chairperson of board	.958	.036	.756	.120	.721	.141
Industry-adjusted OIBD	5.117	.190	9.616	.025	10.485	.016
Stock return for prior year	−.549	.402	−.431	.554	−.766	.314
Premium offered (%)	−.975	.276	−1.738	.085	−2.002	.053
Proportion of cash in offer	1.544	.040	.974	.211	.966	.224
Observations	526		526		525	
Likelihood ratio statistic	100.96	.000	86.42	.000	86.25	.000
Likelihood ratio index	30.56%		31.09%		31.62%	

NOTE.—Logistic regressions of the probability that the takeover targets announced a defensive special dividend or share repurchase. The dependent variable in model a is an indicator variable equal to one if the firm either paid a defensive special dividend or carried out a defensive share repurchase, zero otherwise. The dependent variables in models b and c equal one only for those firms that carried out defensive share repurchases. The sample size in model c is smaller by one observation since the regression model excludes one firm that carried out its defensive share repurchase prior to the announcement of the unsolicited takeover attempt. Also see the notes to tables 1–3.

for firms that announced either a defensive special dividend or a defensive share repurchase, and zero otherwise; the dependent variable in models b and c equals one for firms that announced a defensive share repurchase, and zero otherwise.[11] Model c differs from model b in that it excludes one firm that announced its defensive share repurchase before its attempted takeover was announced. The independent variables in all models are those utilized in table 3, except that all models in table 4 include both insider ownership and a second-order ownership term to test for a nonlinear relationship as predicted by Stulz's (1988) model.

The logistic regressions indicate that firms are more likely to conduct defensive payouts in response to attempted takeovers if they are large and have low debt levels and market-to-book ratios. Further, firms are more likely to undertake defensive payouts if they have excess cash (consistent with Harford's [1999] and Pinkowitz's [1999] conjectures) or if they have the ability

11. We also estimated a regression model in which the dependent variable equaled one for those firms that paid out defensive special dividends, and zero otherwise. The only coefficient that differed significantly from zero was the positive coefficient on firm size. Because of the small number of defensive special dividends and the low explanatory power in the regression model, we do not tabulate these results.

to tap into an overfunded pension plan. Our results on debt, cash levels, and overfunded pensions are intuitive because defensive payouts, unlike poison pill adoptions, require financial flexibility in the form of excess cash or debt capacity. Closer inspection reveals that the negative coefficient on the market-to-book ratio is driven by the defensive share repurchases. If the market-to-book ratio partially captures the extent to which the managers perceive the firm to be undervalued, our results suggest that managers choose to repurchase shares when they believe that their firm's shares are undervalued.

The coefficients on the first-order insider holdings variable are positive and statistically significant in all models, whereas the coefficients on the second-order insider ownership term are all significantly negative. Thus the probability that a firm announces a defensive payout increases with insider ownership levels, but it does so at a decreasing rate. Because the insider ownership variables do not affect the decision to pay a special dividend (not tabulated), the documented curvilinear relation between defensive payouts and insider ownership is driven by defensive repurchases. Our results provide strong support for Stulz's (1988) model, which incidentally pertains only to share repurchases and not to dividends. Other studies also provide evidence consistent with Stulz's model, including McConnell and Servaes (1990), which documents a curvilinear relation between firm value and insider ownership; but such studies are plagued with endogeneity issues (Cho 1998) and provide less direct evidence than we do here.

The significantly negative coefficient on the fraction of outside directors suggests that, all else equal, firms with greater proportions of outside directors are less likely to announce defensive payouts.[12] Finally, the negative coefficient on the premium offered variable in models b and c indicates that managers are more likely to announce a defensive share repurchase when the premiums offered in the takeover attempt are low. In this regard, model c is more relevant since it excludes the one observation in the sample in which the defensive share repurchase preceded the announcement of the attempted takeover and, thus, the revelation of the premium offered to shareholders. Consequently, managers appear to consider the value of the takeover offer to their shareholders when deciding whether to employ defensive share repurchases.

D. Determinants of Takeover Success

Table 5 reports the results from logistic regressions that examine the extent to which defensive maneuvers made by takeover targets affect the likelihood of takeover success. Twenty-one percent (111 of 526) of the takeover attempts in the sample were completed without the offer ever having been withdrawn.

12. Note that this result appears to contrast with the univariate evidence that the collective set of firms in the sample that adopted poison pills, defensive payouts, or both had higher proportions of outside board representation. The multivariate analysis controls for characteristics that might influence or otherwise correlate with the extent of outside board representation, e.g., firm size. In addition, we perform separate multivariate logistic regression analyses for both poison pill adoption and defensive payouts. As a result, we view the multivariate results as more informative.

TABLE 5 Probability That the Firm Is Taken Over

	Model a		Model b	
	Coefficient	*p*-Value	Coefficient	*p*-Value
Intercept	−7.087	.011	−2.274	.315
Log of equity market value	.127	.303	−.216	.034
Total liabilities/assets	−.765	.267	.118	.829
Excess cash/assets	.796	.565	.181	.876
Pension overfund $/assets	−1.358	.781	−7.552	.058
Market-to-book assets	.592	.113	.322	.312
Multiple bidders	−.465	.049	.851	.000
Existing poison pill	.058	.835	−.222	.328
Morning-after pill	.230	.482	−.354	.192
Special dividend	−.697	.402	−.352	.601
Share repurchase	−.903	.089	−.711	.075
Insider ownership	−1.570	.201	.456	.621
Staggered board	−.140	.553	.016	.934
Log of CEO compensation	.230	.368	.350	.100
Fraction of outside directors	.334	.601	−.076	.882
CEO = chairperson of board	.115	.650	−.065	.747
Industry-adjusted OIBD	1.824	.422	1.630	.365
Stock return for prior year	−.405	.317	.222	.492
Premium offered (%)	1.400	.013	.600	.184
Proportion of cash in offer	.629	.112	−.462	.141
Observations	526		526	
Likelihood ratio statistic	43.10	.001	49.66	.000
Likelihood ratio index	7.99%		6.81%	

NOTE.—Logistic regressions of the probability that the targeted firm is taken over. The dependent variable in model a equals one if the bidder's takeover attempt succeeded, and zero otherwise. The dependent variable in model b equals one if the target firm was acquired within three years after the bidder's offer, by either the initial bidder or another firm not considered to be a white knight. See also the notes to tables 1–3.

We include as independent variables those used in previous models as control variables along with indicator variables to identify the target firms that had poison pills in place before the attempt, those that adopted morning-after pills, and those that paid defensive special dividends or carried out defensive share repurchases.

The dependent variable in model a is an indicator variable equal to one for offers that succeeded, and zero otherwise. As expected, the likelihood that an individual takeover attempt is successful is lower if there are competing bidders and if the premium offered is higher. More important for the purposes of this study, the coefficients on the poison pill indicator variables are not statistically different from zero, suggesting that poison pills do not materially affect the probability of takeover success. This evidence supports Comment and Schwert's (1995) conclusion that poison pills do not effectively deter takeovers. The coefficients on both of the defensive payout indicators are negative, although the coefficient on the special dividends indicator is not statistically different from zero, perhaps because of the relatively small number of defensive special dividends. The coefficient on the repurchase indicator variable is negative and marginally significant (*p*-value = .089), suggesting that defensive repurchases slightly reduce the probability of takeover success. These results are consistent with the arguments of Harris and Raviv (1988),

Stulz (1988), Bagnoli, Gordon, and Lipman (1989), Bagwell (1991), and Sinha (1991), who all argue that defensive repurchases can be used to deter takeovers.

Model b uses a longer-term measure of takeover likelihood as the dependent variable. As we report in table 1, within the three-year period after the announced takeover attempts, 51% of the targeted firms were acquired in transactions in which the eventual acquirer was not considered to be a white knight. The dependent variable in model c captures this information by taking on a value of one for those firms that were acquired within the subsequent three years, and zero otherwise. The coefficient on the multiple bidders indicator is positive and highly significant (p-value $< .01$), indicating that targets are more likely to be acquired within three years if multiple bidders are involved. The only defensive measure that affects the probability of takeover is a defensive share repurchase. The marginally significant negative coefficient on the defensive share repurchase indicator variable (p-value $= .075$) suggests that firms that undertake defensive repurchases are slightly less likely to be acquired.[13]

E. Determinants of Bid Increases and Total Premiums

If a defensive mechanism is in shareholder interests, it will assist management in thwarting undervalued takeover offers, negotiating for higher premiums, or both. We focus on the latter in this subsection. In our sample, bidders increase their offer price in 44% of the cases. In those instances in which bids are increased, the mean increase relative to the price of the target 20 days before the announcement of the first offer is 22.2% and the median increase is 18.7%.

Table 6 presents two regression models that relate to shareholder premiums. In model a, the dependent variable is the percentage increase in the bidder's initial offer price. Thus the estimated regression captures the extent to which the defensive measures allow managers to negotiate for higher premiums once an initial bid has been made. As expected, average bid increases are significantly larger (4.2%) when there are multiple bidders (p-value $< .01$). The significantly positive coefficients on the existing poison pill and morning-after pill indicator variables show that firms with poison pills, whether adopted in advance of or in response to takeover attempts, are able to negotiate for larger premium increases than firms that lack such a defense. The magnitudes of the coefficients are very similar for existing and morning-after pills and suggest that, ceteris paribus, poison pills produce premium increases of 3.5%. The only other coefficient in the model that is statistically significant is that

13. Unlike Bebchuk et al. (2002), we find no evidence that staggered boards reduce the likelihood of takeover completion. In untabulated regressions, we also included an indicator variable equal to one if the firm had both a poison pill and a staggered board to more directly test Bebchuk et al.'s argument that the combination of poison pills and staggered boards is particularly effective in deterring unsolicited takeovers. The coefficient on this variable was not statistically significant when added to either model a or model b. In fact, it was positive in model a with a p-value of .60 and negative in model b with a p-value of .93.

TABLE 6 Regressions of Premium Increases and Total Premiums

	Model a		Model b	
	Coefficient	*p*-Value	Coefficient	*p*-Value
Intercept	−.126	.335	−.158	.570
Log of equity market value	.009	.138	−.005	.686
Total liabilities/assets	.044	.161	.129	.054
Excess cash/assets	−.008	.900	−.019	.892
Pension overfund $/assets	−.382	.091	−.032	.946
Market-to-book assets	−.009	.623	−.020	.599
Multiple bidders	.042	.000	.083	.000
Existing poison pill	.035	.008	.064	.022
Morning-after pill	.035	.025	.071	.032
Special dividend	−.013	.726	.015	.854
Share repurchase	.015	.501	−.042	.361
Insider ownership	.050	.341	.283	.011
Staggered board	.001	.957	−.014	.561
Log of CEO compensation	.001	.912	.042	.103
Fraction of outside directors	.034	.248	.066	.291
CEO = chairperson of board	.011	.335	.043	.083
Industry-adjusted OIBD	−.005	.962	.031	.889
Stock return for prior year	−.039	.036	−.249	.000
Premium offered (%)	.030	.239		
Proportion of cash in offer	.001	.955	−.028	.459
Observations	526		526	
F-statistic for regression	2.93	.000	4.78	.000
Adjusted R^2	6.52%		11.46%	

NOTE.—The dependent variable in model a is the percentage increase in the bidder's offer price scaled by the target's price 20 days prior to the offer. The dependent variable in model b is the total percentage premium (initial premium plus any premium increase) offered by the bidder (relative to the target's price 20 days prior to the offer). Also see the notes to tables 1–3.

on the stock return for the prior-year variable. All else equal, targets that experienced poorer stock returns in the prior year are able to negotiate for larger premium increases, perhaps by more credibly arguing that their stock price is only temporarily depressed. The coefficients on both defensive payout measures are statistically indistinguishable from zero, suggesting that defensive payouts do not, on average, lead to bid increases. The collective evidence on defensive share repurchases suggests that they are more effectively used to thwart takeover overtures than to negotiate for better takeover terms.

The dependent variable in model b is the total premium offered in the takeover attempt (initial premium plus any subsequent increases) scaled by the target's share price 20 days prior to the announcement of the takeover attempt. The results for this model are qualitatively similar to those for model a. The only exception is that the coefficient on insider ownership is significantly positive in model b, perhaps because managers of acquiring firms realize that they have to bid more when insiders of the target own a large fraction. The coefficient on the multiple bidders variable indicates that total premiums are 8.3% larger when there are multiple bidders (p-value < .01). The coefficients on the existing poison pill and morning-after poison pill variables suggest that total premiums are 6.4% larger for firms that had existing poison pills and 7.1% larger for firms that adopted morning-after pills (p-values <

.05). Thus, regardless of whether poison pills are already in place or are adopted after an offer has been made, they enable targets to extract larger premiums for shareholders. Our results suggest that poison pills are, on average, in the best interests of shareholders, since they prove effective as a tool for negotiating for more highly valued offers without entrenching incumbent management; the value of defensive payouts is more questionable. We provide more evidence on the net wealth effect of poison pills and defensive payouts in the next subsection.

F. Determinants of Shareholder Gains

The multivariate evidence presented thus far suggests that shareholders of target firms benefit from poison pills because they induce greater premiums, but they might be hurt by defensive payouts because they reduce takeover likelihood. However, because defensive payouts entail financial restructurings that could resolve many of the problems that made the firm an attractive takeover target in the first place (e.g., underutilized debt capacity and overinvestment), it is possible that shareholders of these firms experience share price gains comparable to those of shareholders of other takeover targets, even though our prior regressions show that they are less likely to receive a takeover premium. Indeed, Denis (1990), Berger, Ofek, and Yermack (1997), Denis, Denis, and Sarin (1997), and Berger and Ofek (1999) find that control contests prompt firms to undergo significant corporate restructurings, and Safieddine and Titman (1999) find that many target firms substantially increase leverage following unsuccessful takeover offers and thereby commit to making the improvements that might have been made by the acquirer. This restructuring appears to have a positive effect on stock price performance, since Safieddine and Titman find that firms that undergo significant leverage increases tend to perform better than their benchmarks in the five years subsequent to the failed takeovers. It is also possible that defensive payouts primarily thwart undervalued offers that would not generate much value for target shareholders anyway, consistent with the negative relation between the probability of a defensive payout and the premium offered.

We design our final empirical tests to gauge whether the poison pills and defensive payouts materially alter overall shareholder gains. First, we estimate shareholder gains using a one-factor market model (estimation period spans from -270 to -21 trading days prior to the takeover announcement) and calculate cumulative abnormal stock returns starting from 20 days before the announcement date through the effective date for successful takeover attempts and five days after the withdrawal date for unsuccessful attempts. The mean (median) shareholder gain is 25% (20%) for unsuccessful takeovers and 46% (47%) for successful takeovers. Thus, although the gains to shareholders of targeted firms are clearly larger for successful offers, they are still material even if the takeover is unsuccessful, perhaps because the firms are still in

TABLE 7 Regressions of Gains to Targeted Shareholders

	Model a		Model b	
	Coefficient	*p*-Value	Coefficient	*p*-Value
Intercept	−.109	.695	1.018	.177
Log of equity market value	.011	.352	.015	.662
Total liabilities/assets	−.037	.579	−.125	.491
Excess cash/assets	−.208	.140	−.548	.153
Pension overfund $/assets	−.536	.262	−1.718	.186
Market-to-book assets	−.024	.532	−.092	.384
Multiple bidders	.151	.000	.151	.016
Existing poison pill	.054	.050	.040	.597
Morning-after pill	.037	.266	−.012	.894
Special dividend	.109	.174	.468	.032
Share repurchase	.012	.785	.011	.931
Insider ownership	.074	.509	.369	.224
Staggered board	.033	.156	−.021	.744
Log of CEO compensation	.001	.974	−.105	.138
Fraction of outside directors	.084	.178	.160	.343
CEO = chairperson of board	.010	.681	.074	.271
Industry-adjusted OIBD	.540	.014	.672	.261
Stock return for prior year	−.370	.000	−.121	.258
Premium offered (%)	.405	.000	.542	.000
Proportion of cash in offer	−.016	.681	.027	.795
Observations	526		526	
F-statistic for regression	14.56	.000	2.38	.001
Adjusted R^2	32.92%		4.76%	

NOTE.—Regressions of gains to the target firms' shareholders. The dependent variable in model a is the cumulative abnormal return to the target's shareholders as estimated using a one-factor market model from 20 days before the first announcement through either the effective date for successful takeover attempts, or through five days after the withdrawal date for unsuccessful attempts. The dependent variable in model b is the difference between the target firm's cumulative stock return and the cumulative return on an industry index comprising five firms with the closest market capitalization to the target firm. This excess return measure covers the interval from 20 days before the announcement of the takeover attempt either through three years for firms that are not subsequently taken over or otherwise delisted, or through the delist date for firms that are delisted for any reason within the following three years. Also see the notes to tables 1–3.

play or because the takeover process has resulted in value-enhancing restructuring.

Second, we estimate a longer-term measure of shareholder gain. In particular, we estimate the difference between the target firms' cumulative stock return and the cumulative return on an industry index comprising five firms with the market capitalization closest to that of the target firm. This measure covers the interval from 20 days before the announcement of the takeover attempt through three years for firms that are not subsequently taken over or delisted, or through the delisting date for firms that are delisted for any reason within the following three years.

Table 7 contains the results of our multivariate tests of whether shareholder gains are larger when managers employ takeover defenses using either the return through the outcome of the takeover attempt (model a) or the longer-term return (model b). The independent variables are those used in our prior tables. Because of the additional noise inherent with long-term return benchmarks such as that used in model b, we focus our interpretation primarily on

the results in model a and highlight where the results from the two models differ. As expected, shareholder gains are significantly positively related to initial premiums and negatively related to the stock price performance in the prior year. In addition, gains are about 15% higher when there are competing bidders. The coefficient on the existing poison pill indicator in model a shows that the gains are, on average, 5.4% higher (p-value = .05) when the firm has a poison pill in place prior to the announcement of the takeover attempt. The coefficient on the morning-after pill indicator variable is also positive at 3.7% but is not statistically significant at conventional levels (p-value = .27). We also estimated another regression (not tabulated) in which we combined the poison pill indicators to capture all firms that had a poison pill, regardless of whether they were adopted before or shortly after the takeover announcement, and found the coefficient on the poison pill variable to be 4.8% (p-value = .05). Overall, we conclude that shareholder gains are significantly larger for firms that had established a poison pill plan at some point prior to the resolution of the takeover contests. Not unexpectedly given the extra noise associated with the longer interval over which returns are measured, the coefficients on the poison pill indicators are not significant in model b.

The coefficients on the special dividend and share repurchase variables do not statistically differ from zero in model a, although the coefficient on the special dividend variable is significantly positive in model b. In light of these results and earlier results suggesting that special dividends have little effect on the takeover success, we are led to conclude that defensive special dividends do not harm shareholder wealth. Although the defensive share repurchases appear to slightly reduce the takeover probability, the multivariate regressions on shareholder gains presented here show that they do not hurt shareholder returns.

VI. Conclusion

Using a sample of 526 hostile takeover attempts, we investigate the relation between management's choice of defensive strategies, the target firm's financial characteristics, ownership characteristics, governance characteristics, and the takeover process. Relative to the other sample firms, takeover targets with poison pills in place prior to the takeover attempts have lower excess cash balances and lower levels of insider holdings, both of which are associated with an otherwise weak managerial bargaining position. We find that firms that adopt morning-after pills in direct response to unsolicited takeover offers have lower insider holdings and higher market-to-book ratios than other firms without pills at the time of the takeover announcement. The result for insider holdings combined with other results on the effect of poison pills suggest that firms with low insider holdings adopt poison pills because their bargaining power would otherwise be too weak. Further, firms are more likely to adopt poison pills if they have staggered boards, suggesting that these defensive mechanisms are complementary. On the other hand, firms that undertake

defensive share repurchases tend to have considerable financial flexibility in the form of high cash levels, overfunded pension plans, and low debt levels, which facilitates the financing of such a transaction, and low market-to-book ratios, which makes repurchases seem relatively more attractive. Perhaps most interesting, the probability of undertaking a defensive repurchase increases with insider ownership at a decreasing rate. This curvilinear relation between insider ownership and repurchase probability represents direct evidence in support of Stulz's (1988) model.

Further evidence suggests that poison pills tend to be used in manners that are in the best interests of shareholders, regardless of whether they were in place in advance of or adopted in response to the takeover attempts. In particular, poison pills enhance the bargaining power of the target firm, thereby raising the takeover premium, but do not reduce the likelihood of takeover success. As a result, pills positively affect shareholder returns during the takeover process. At a minimum, our evidence with regard to poison pills suggests that the efforts made by shareholder activists to force firms to repeal their poison pills plans (see Bizjak and Marquette 1998; Sidel 2004) are misguided. In addition, at least with regard to poison pills, the evidence raises concerns about the increasing trend for both practitioners (such as Institutional Shareholder Services with its corporate governance quotient) and academic researchers (such as Gompers, Ishii, and Metrick [2003] and their corporate governance index) to create corporate governance metrics that effectively penalize firms for having poison pill plans in place.

Defensive payouts are quite different with regard to the characteristics of firms that implement them and in how they affect the outcomes of corporate control contests. Our evidence suggests that defensive repurchases slightly reduce the likelihood of takeover success but do not induce higher takeover premiums. Yet the shareholder returns are not adversely affected by the use of defensive payouts. There are two possible reasons for this. Defensive payouts tend to be used in response to low-premium bids that would generate less value for target shareholders anyway. In addition, they leave the firm more highly leveraged, such that the target firm might emerge from the takeover process with a higher value even if the takeover attempt fails.

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