Shark Repellents and Managerial Myopia: An Empirical Test

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Comment

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I. Introduction

Since the proxy fights of the 1950s, commentators have debated the welfare implications of corporate takeovers. Although observers such as Manne (1965), Jensen and Meckling (1976), Fama (1980), and Jensen and Ruback (1983) argue that the market for corporate control promotes efficiency and enhances wealth, some critics, such as managers of firms subject to hostile takeover attempts, contend that takeovers destroy firm value. The critics frequently assert that takeover pressure forces managers to sacrifice profitable, but slow-yielding, long-term investments in favor of less productive short-term investments that offer immediate returns.

While the evidence supporting takeover-induced shortsightedness is largely anecdotal, a recent paper by Stein (1988) develops a formal

model in which the threat of takeovers encourages myopic behavior on the part of managers. A central prediction of Stein's model is that firms that construct barriers to takeover are able to increase profitable long-term investments such as research and development (R & D). This paper provides empirical evidence that firms actually decrease R & D intensity after the introduction of shark repellents, thus failing to support Stein's prediction. The findings suggest that takeover impediments may reduce incentives to engage in long-term investments.

II. Managerial Myopia

Stein develops a model in which the combination of costly information and takeover threats encourages managers of undervalued firms to behave myopically. In the model, managers know more than the market about the prospects of firms' projects, with the information asymmetry being greater for long-term investments. Firms with superior projects having delayed returns suffer from underpricing until the long-term investments begin to yield earnings. If a takeover occurs before the payoff of long-term projects is known, stockholders in these undervalued firms will receive a price that does not reflect the true value of the firm.

To protect shareholders from this potential wealth loss, managers of undervalued firms attempt to boost the firms' current earnings by cutting long-term investments that the market cannot value accurately. Stein argues that boosting current earnings leads the market to favorably reevaluate the firm's prospects, thereby increasing the stock price. As managers shift from longer-term investments to more easily valued shorter-term projects, undervaluation is reduced. The cost of this short-term perspective is the sacrifice of profitable long-term investments.

The information asymmetry in Stein's model is an outgrowth of the modern corporation. As Myers and Majluf (1984, p. 196) note, "the separation of ownership from professional management naturally creates asymmetric information." At issue, however, is whether managers with private information decrease profitable long-term investments, as Stein proposes, or find other, less costly, ways to inform the market. Barzel (1977) points out that market participants are quite innovative in devising methods to mitigate wasteful reduction of profitable investments. For example, the presence of stock analysts, auditors, and other experts that estimate project values lessens the information asymmetry that generates mispricing. Managers can also credibly reveal their belief that the firm is undervalued by initiating stock repurchases or by accepting compensation contingent on project outcome.

In a setting similar to Stein's model, Knoeber (1986) argues that shareholders will implement deferred compensation plans when managerial performance can be evaluated only in the long run. Since the long-term contracts between managers and current shareholders might be compromised by a hostile takeover, both management and shareholders will benefit from golden parachutes that assure that management will receive the promised compensation in the event of a takeover. Knoeber supports his hypothesis with evidence that the likelihood of the use of a golden parachute is a positive function of a firm's capital expenditures.[1]

Recognizing the possibility of contractual responses, Stein states that corporate antitakeover amendments, by sheltering managers from takeover pressure,[2] might reduce the incentive for managers to cut long-term investments. He maintains that Linn and McConnell's (1983) finding of positive abnormal returns surrounding the implementation of antitakeover amendments reflects a reduction in managerial myopia. This stock price evidence may be unrelated to myopia, however, and may instead reflect greater bargaining power during takeovers for firms with antitakeover provisions or reflect an increase in the probability of a takeover bid. Furthermore, other empirical studies by DeAngelo and Rice (1983) and Jarrell and Poulsen (1987) find negative effects on shareholder wealth around the passage of antitakeover amendments, suggesting that the amendments protect incumbent management rather than reduce myopia.[3]

Given the ambiguous implications of the stock price analysis for his model, Stein proposes that "a sharper test might be to examine a measure of managerial farsightedness such as capital or R & D expenditures before and after the adoption of antitakeover provisions" (p. 78, n. 19). We conduct such a test by examining changes in the R & D/ sales ratio for a sample of firms implementing antitakeover amendments. As Stein suggests, if takeover pressure induces myopic behavior, firms should increase their R & D intensity following the passage of antitakeover provisions.

III. Empirical Analysis

We draw our sample of firms adopting antitakeover amendments from Jarrell and Poulsen's (1987) compilation of 649 antitakeover

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[1] Knoeber suggests that shark repellents might also encourage investments in long-term projects, but he offers no supporting evidence for this conjecture.

[2] Pound (1987) provides evidence that antitakeover amendments lessen the likelihood of a takeover.

[3] Jarrell, Brickley, and Netter (1988) report that researchers have found that takeover impediments such as poison pills and state antitakeover laws generally reduce shareholder wealth.

amendments proposed between January 1979 and May 1985. From the Jarrell and Poulsen sample, we locate 554 firms on the Standard and Poor's Compustat data base. Table 1 presents the incidence of the 554 firms across two-digit Standard Industrial Classification (SIC) industries, ranking the industries by average R & D/sales in 1985. Intensity of R & D varies substantially by industry, but industry R & D intensity appears unrelated to the percentage of firms in an industry that adopt antitakeover amendments.[4]

The empirical analysis excludes firms that have no reported R & D expenditures in the sample period. Many of the excluded firms come from retail and financial services, spanning SIC codes of 5000 or higher. After the exclusions, the sample contains 203 firms. As in the full Jarrell and Poulsen sample, most firms in the subsample introduced amendments during 1983–85. Six firms passed amendments in 1979, 4 in 1980, 5 in 1981, 9 in 1982, 63 in 1983, 72 in 1984, and 44 in 1985.

A. The Basic Specification

For each of the 203 firms introducing shark repellents, we investigate the change in R & D/sales over various windows surrounding year 0, the year the firm enacts the shark repellent. For example, the $(-1, 1)$ window measures the percentage change in the firm's R & D/sales between the year prior to the amendment and the year after the amendment. We also calculate the percentage change for the $(-1, 2)$ and $(-1, 3)$ windows; the longer windows are appropriate if firms adjust their R & D slowly. Row 1 of table 2 displays the mean percentage change across all firms for the three windows.[5]

The managerial myopia hypothesis predicts that R & D/sales will increase after the adoption of a shark repellent. The data fail to support this prediction. For all three windows, R & D/sales changes insignificantly on average following the introduction of shark repellents: it increases 0.43 percent ($t = 0.14$) in the $(-1, 1)$ window, decreases 0.04 percent ($t = -0.01$) in the $(-1, 2)$ window, and decreases 2.98 percent ($t = -0.46$) in the $(-1, 3)$ window.

During the period of examination, however, market R & D/sales increases substantially.[6] During 1980–87, market R & D/sales expen-

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[4] The Pearson correlation coefficient between industry R & D/sales and the percentage of firms in an industry with antitakeover amendments is $-.08$ ($p = .54$). In a separate analysis, we find that takeovers occur relatively more often in industries with low R & D intensity. See also Hall (1988).

[5] The number of observations declines as the window lengthens because of (a) the acquisition of some firms in the sample even after the adoption of antitakeover amendments and (b) the absence of 1988 data for the firms passing amendments in 1985.

[6] Market R & D/sales for a given year is the sum of the R & D for all Compustat firms divided by the sum of the sales for all Compustat firms.

TABLE 1

DESCRIPTIVE STATISTICS OF SHARK REPELLENT SAMPLE

SIC Code	Industry	1985 R & D/ Sales (%)	Number of Firms in Industry	Number from Jarrell/ Poulsen	Percentage with Amendment	Number in R & D Sample
38	Instruments and related products	5.92	407	26	6.39	22
36	Electronic and other equipment	4.83	453	33	7.28	22
35	Industrial machinery and equipment	4.80	503	48	9.54	39
28	Chemicals and allied products	4.17	281	30	10.68	24
37	Transportation equipment	3.29	143	21	14.69	14
73	Business services	2.97	428	10	2.34	2
30	Rubber and miscellaneous plastic products	1.77	100	9	9.00	5
01	Agricultural production: crops	1.61	13	2	15.38	1
87	Engineering and management services	1.60	166	2	1.20	1
67	Holding and other investment offices	1.46	264	6	2.27	0
39	Miscellaneous manufacturing industries	1.45	83	7	8.43	3
48	Communications	1.43	194	9	4.64	1
26	Paper and allied products	1.35	72	11	15.28	6
32	Stone, clay, and glass products	1.18	57	10	17.54	5
13	Oil and gas extraction	1.14	397	25	6.30	3
34	Fabricated metal products	.95	148	25	16.89	17
33	Primary metal industries	.75	99	11	11.11	2
61	Nondepository institutions	.66	113	5	4.42	0
29	Petroleum and coal products	.60	49	12	24.49	8
20	Food and kindred products	.57	153	15	9.80	6

14	Nonmetallic minerals, except fuels	.56	11	2	18.18	1
22	Textile mill products	.50	67	7	10.45	2
25	Furniture and fixtures	.47	55	9	16.36	6
64	Insurance agents, brokers, and services	.39	27	2	7.41	0
07	Agricultural services	.33	9	1	11.11	1
24	Lumber and wood products	.29	52	4	7.69	1
16	Heavy construction, except building	.22	19	2	10.53	1
31	Leather and leather products	.20	25	3	12.00	1
79	Amusement and recreation services	.15	66	4	6.06	1
21	Tobacco products	.12	6	1	16.67	1
27	Printing and publishing	.10	117	14	11.97	2
15	General building contractors	.09	24	4	16.67	0
23	Apparel and other textile products	.08	55	3	5.45	1
59	Miscellaneous retail	.08	94	9	9.57	0
80	Health services	.06	100	5	5.00	2
62	Security and commodity brokers	.06	79	1	1.27	0
72	Personal services	.04	18	2	11.11	0
17	Special trade contractors	.04	22	1	4.55	0
51	Wholesale trade: nondurable goods	.04	108	8	7.41	0
53	General merchandise stores	.03	72	9	12.50	0
50	Wholesale trade: durable goods	.03	197	11	5.58	1
57	Furniture and home furnishing stores	.03	52	2	3.85	0
10	Metal mining	.02	70	3	4.29	0
49	Electric, gas, and sanitary services	.01	276	38	13.77	1
52	Building materials and garden supplies	.01	25	3	12.00	0
65	Real estate	.01	175	4	2.29	0
	12 industries with zero R & D	.00	823	85	10.33	0
	Total	1.40	6,767	554	8.19	203

TABLE 2

Effect of Antitakeover Amendments on R & D: Percentage Change
in R & D/Sales after the Introduction of Antitakeover Amendments

Percentage Change in R & D	Window Length		
	(−1, 1)	(−1, 2)	(−1, 3)
Simple percentage change	.43	−.04	−2.98
	(.14)	(−.01)	(−.46)
Number of firms[a]	199	184	128
Market-adjusted	−15.42*	−25.29*	−36.25*
	(−5.14)	(−6.58)	(−5.53)
Number of firms	199	184	128
Industry-adjusted	−5.99**	−11.46*	−12.04**
	(−1.98)	(−2.70)	(−2.00)
Number of firms	174	158	111

Note.—t-statistics are in parentheses. Simple percentage change is the percentage difference between R & D/sales following the passage of an antitakeover amendment and R & D/sales prior to passage. A negative number indicates that R & D/sales fell after passage. The R & D/sales data come from Compustat. The sample of firms passing antitakeover provisions comes from Jarrell and Poulsen (1987). Market-adjusted percentage change subtracts the marketwide percentage change in R & D/sales from the simple percentage change. The marketwide change comes from all firms on Compustat in a given year. Industry-adjusted percentage change subtracts the industry percentage change from the simple percentage change. The industry for a particular firm is taken from the firm's primary three-digit SIC code. The window lengths are the years surrounding the year the firm passes the antitakeover amendment. The managerial myopia hypothesis predicts that firms will increase R & D spending after the passage of antitakeover amendments (the percentage change in R & D should be positive).
[a] The sample size lessens as the window lengthens because some firms are acquired even after the passage of antitakeover provisions and because of the absence of 1988 data for some of the firms passing amendments in 1985. The industry-adjusted sample has fewer firms because in some of the industries associated with a firm's primary SIC code, fewer than five firms had nonzero R & D expenditures.
* Significant at the .01 confidence level.
** Significant at the .05 confidence level.

ditures increase at a compound annual growth rate of 9.7 percent. To
evaluate how a firm's R & D intensity changes with market effects held
constant, we compute a market-adjusted change in R & D/sales by
subtracting the market change from the individual firm change. The
second row of table 2 reports the market-adjusted results. On aver-
age, firms significantly decrease their R & D intensity relative to the
market after proposing a shark repellent. Market-adjusted R & D/
sales falls 15.42 percent ($t = -5.14$) in the (−1, 1) window, 25.29
percent ($t = -6.58$) in the (−1, 2) window, and 36.25 percent ($t =
-5.53$) in the (−1, 3) window. These results are inconsistent with
Stein's prediction of an increase in R & D/sales following the in-
troduction of antitakeover amendments.

Since R & D/sales varies across industries (see table 1), using an
industry-adjusted rather than a market-adjusted measure may con-
trol more precisely for changes in R & D during the sample period.
To measure how the firm's R & D intensity changes relative to its
industry, we subtract industry rather than market percentage changes

from the simple percentage changes.[7] The third row of table 2 displays the industry-adjusted changes in R & D/sales.[8] The industry-adjusted results are similar to the market-adjusted results, though of smaller magnitude. Industry-adjusted R & D/sales declines 5.99 percent ($t = -1.98$) in the $(-1, 1)$ window, 11.46 percent ($t = -2.70$) in the $(-1, 2)$ window, and 12.04 percent ($t = -2.00$) in the $(-1, 3)$ window. The results contradict the managerial myopia hypothesis: firms significantly decrease R & D intensity relative to industry R & D intensity following an antitakeover amendment.

B. Additional Specifications

Why do firms significantly decrease R & D intensity after implementing a shark repellent? An explanation consistent with Stein's model is that firms might face considerable takeover pressure even after adopting an antitakeover amendment. Fifty-two of the 203 firms were the targets of successful or unsuccessful mergers or tender offers after passing antitakeover provisions. If these firms face increased takeover pressure in spite of introducing a shark repellent, including them in the sample may obscure the response of firms for which the shark repellents are effective. To test this possibility, we repeat the analysis after excluding firms that became takeover targets. The results do not differ from the full-sample analysis: firms decrease R & D intensity following adoption of a shark repellent.[9]

Another interpretation of the decrease in R & D intensity after the introduction of antitakeover amendments is that takeover pressure builds suddenly before a firm adopts an amendment and then falls after adoption. The sharp escalation of takeover pressure may actually occur in event year 0, the year of the amendment, rather than in event year -1. In this case, using year -1 as a base year to measure the change in R & D intensity may be inappropriate; takeover pressure may be relatively low in year -1 and relatively high in year 0. To allow for abrupt jumps in takeover pressure, we investigate how R & D intensity changes if we use year 0 as our comparison year. The results do not differ from those in table 2. Firms reduce R & D

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[7] Industry R & D/sales is the sum of the R & D for all firms in a given three-digit SIC code that report more than $10,000 in R & D, divided by the sum of the sales of those firms. Using four-digit industries rather than three-digit industries does not significantly alter the results.

[8] The number of firms in the industry-adjusted sample is less than in the simple and market-adjusted samples because the industry-adjusted sample excludes industries with fewer than five other firms with nonzero R & D expenditures.

[9] Owing to the similarity of these results to those reported in table 2, we do not report them here. They are available on request, as are other results mentioned in this section but not reported.

intensity after easing takeover pressure by passing a shark repellent, even after allowing for potentially rapid increases in takeover pressure.[10]

IV. Concluding Comments

Stein's model of managerial myopia formalizes the popular notion that impeding hostile takeover attempts will free managers to concentrate on longer-term investment horizons. Prior research, however, showing that firm-specific and legislated takeover restrictions are associated with negative stock price reactions provides indirect evidence that takeovers do not induce managerial shortsightedness.

We directly investigate whether takeover threats force managers to focus on the short term by examining expenditures on R & D surrounding the introduction of antitakeover amendments. Contrary to Stein's prediction, we find a decrease in R & D/sales following the implementation of antitakeover amendments. A possible explanation of the reduction in R & D is that antitakeover provisions entrench management and free them from the discipline of the corporate control market.[11] This interpretation is consistent with the stock price evidence that defensive measures harm target shareholders. The finding of declining R & D/sales suggests that shark repellents may exacerbate, rather than mitigate, managerial myopia.

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[10] These results remain robust to excluding firms that become targets following passage of an antitakeover amendment.

[11] In a separate analysis, we find that, on average, firms that become takeover targets have lower R & D/sales than firms that are not takeover targets (even after controlling for industry and size effects). The relatively low R & D spending of takeover targets may reflect pervasive bad management, which attracts a disciplinary takeover attempt. See also Securities and Exchange Commission (1985).

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