

Reversions of excess pension assets after takeovers

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This article evaluates pension asset reversions as a source of takeover gains. In our sample of 413 takeovers, pension funds were reverted by 15.1% of acquirers in the two years following hostile takeovers compared to 8.4% in the two years following friendly takeovers. Reversions following takeovers tend to occur in unit-benefit plans, where the potential for wealth transfer is the greatest. These results are consistent with the view that hostile takeovers breach implicit contracts between firms and employees. We estimate that the reversions can on average explain approximately 11% of the takeover premium in cases where they actually occur. Reversions are too small to be the sole, or even dominant, source of takeover gains.

1. Introduction

■ It is well known that shareholders of takeover targets gain considerable wealth (Jensen and Ruback, 1983; Jarrell, Brickley, and Netter, 1988). Disagreement remains, however, about the source of these wealth gains. Some, like Jensen (1986), have concluded that the vast majority of these gains have come from operating improvements. Others have disputed this claim, arguing that a potential source of gains is the transfer of wealth to shareholders from other “stakeholders” of the firm such as bondholders, employees, suppliers, customers, and the government. This potential source of gains has been popularized by Shleifer and Summers (1988), although they present no evidence of large stakeholder losses other than two case studies.

Accounting evidence (Healy, Palepu, and Ruback, 1990; Kaplan, 1989b; and Smith, forthcoming) suggests that shareholders’ gains in takeovers come at least in part from increases in cash flows of acquired firms. These cash flow increases could be a result of either efficiency gains or wealth transfers from stakeholders. Several recent studies have examined possible wealth transfers. Although in some cases stakeholders lose enough to account for a significant fraction of the shareholder gains, on average they lose little wealth. For example,

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average bondholder losses are small (Asquith and Wizman, forthcoming; Dennis and McConnell, 1986), layoffs (Brown and Medoff, 1988; Kaplan, 1989b) and wage reductions (Rosett, 1990) are small, and with the notable exception of leveraged buyouts (Schipper and Smith, 1988; Kaplan, 1989a) tax-bill reductions are small (Auerbach and Reishus, 1988). Bhagat, Shleifer, and Vishny (1990) analyze 62 hostile takeovers and conclude that layoffs and tax reductions are often important but cannot on average account for most of the takeover premium.

This article evaluates another potential source of stakeholder losses: reversions of excess pension assets that often follow takeovers. An acquirer can redistribute wealth from employees to himself by terminating a defined-benefit pension plan. These plans are typically structured so that an average employee receives more pension benefits than his explicit contract calls for. By terminating a pension plan and replacing it with a plan that lowers the expected payments to its workers, an acquirer can redistribute wealth from employees to himself.

To evaluate pension asset reversions as a source of shareholder gains in takeovers, we focus on a sample of 413 acquisitions between 1981 and 1988. For this sample, we first document the incidence of terminations of defined benefit pension plans both before and after the takeover. We distinguish between hostile takeovers and friendly acquisitions, since the analysis of Shleifer and Summers (1988) predicts that a breach of an implicit contract such as a pension obligation is more likely in a hostile takeover. Second, we compare the value of the assets that revert to the corporation in the pension fund termination to the wealth gain of target shareholders in both hostile and friendly deals. To estimate the extent to which pension reversions can explain takeover premia, we need to estimate the fraction of the reverted money that would have gone to the employees had there not been a reversion. We do so using parameters from the literature.

Our results can be briefly summarized. First, pension plan reversions accelerate significantly after acquisitions: there are more than twice as many reversions within the two years after a takeover as within the two years before. Moreover, such reversions are almost twice as common following hostile takeovers (15.1%) as they are following friendly acquisitions (8.4%). Both the acceleration of the pace of reversions and their greater incidence after hostile takeovers are consistent with the claim of Shleifer and Summers (1988) that breach of implicit contracts is a more likely consequence of hostile than of friendly acquisitions. Second, the types of plans that are reverted suggest that a motive for these reversions is to transfer wealth from workers. Unit-benefit plans, which yield higher transfers from employees, are reverted significantly more often than flat-benefit plans. Third, our best estimate is that pension fund reversions explain approximately 11% of the takeover premium in those cases where they actually occur. On average, pension reversions do not appear to explain a large fraction of takeover wealth gains.

The article is organized as follows. Section 2 discusses the theory and evidence on the implicit-contracts view of pension reversions. Section 3 describes the data used in the analysis. Section 4 examines the incidence of reversions in hostile relative to friendly takeovers. Section 5 discusses the extent to which these reversions can explain the premia paid in takeovers. Section 6 presents our conclusions.

2. The implicit-contracts view of pensions

■ For several tax and incentive reasons, it pays firms and workers to delay compensation until a worker retires, i.e., to use pensions (Lazear, 1979; Ippolito, 1986). Most pension plans in the United States are defined-benefit plans. These plans specify the fixed nominal amount that the worker will receive each month after he retires. This amount usually depends on the worker's final (or sometimes average) wage and length of service. Since 1981, firms have been able to legally terminate defined-benefit plans at any time. When a plan is ter-

minated, the firm has the option of either buying annuities equal to its explicit obligations at the time of termination or replacing the plan. If the plan is underfunded, the firm must fully fund it before termination.¹ If the plan is overfunded, the firm can keep all the assets left over after annuities are purchased. The explicit pension contract thus has two key features: it is usually not indexed to inflation, and it allows the firm to terminate and to pay pensions based on current wages and length of service.

As stressed by Ippolito (1985), this explicit pension contract does not describe the actual pension contract accurately. The contract is completed through *implicit* understandings between firms and workers by which firms voluntarily increase the amount of the pension that workers receive. First, firms often provide cost-of-living adjustments they are not legally obligated to provide. Second, firms do not terminate pension plans very often,² allowing pension benefits from previous years to increase with nominal wages. There are two reasons why firms might adopt such a policy. If these increases persuade (perhaps falsely) future workers that more increases will occur in the future, it will become easier for firms to hire them. Also, some managers may be genuinely trustworthy—they may value honoring implicit contracts even though it is profit-maximizing for them to violate them *ex post*.³

We cannot explain why firms and workers use implicit rather than more detailed explicit contracts. However, significant empirical evidence suggests that the implicit-contracts view of defined-benefit pension plans is more accurate than the explicit one. That is, pension benefits that workers expect and usually receive exceed firms' explicit obligations.

□ **Evidence on transfers from existing workers.** To distinguish between the explicit- and implicit-contracts views of pensions, Ippolito (1985) derives predictions of both models regarding the effect of pensions on wage-service profiles. The explicit-contracts view predicts that wage-service profiles should be flatter for pension-covered workers than for other workers. Intuitively, workers who believe that their pensions are likely to be terminated will not save as much through their pensions until late in life, when they are approaching retirement. Alternatively, the implicit-contracts view predicts that pension-covered workers will have wage-service profiles at least as steep as those of similar workers without pensions. Ippolito's evidence favors the implicit-contracts view.

The implicit-contracts model also implies that a defined-benefit plan provides a bond that attaches a worker to the firm, since the portion of the pension that has already been earned rises with the final wage for most workers. Other things equal, this pension bond provides a disincentive for workers in firms with defined-benefit plans to leave their firms. Mitchell (1982) and Schiller and Weiss (1979) confirm this prediction empirically with their finding that mobility rates are lower for pension-covered workers than for other workers. Allen, Clark, and McDermed (1989) estimate that this pension bond can be substantial—for some workers it amounts to about half of annual earnings.

Petersen (forthcoming) tests whether reversions are motivated by the prospect of transferring this pension bond. He estimates that unit-benefit plans, in which the level of benefits depends on the final wage (about 75% of all pension plans), are almost twice as likely to be reverted (2.40% versus 1.27%) as otherwise equivalent flat-benefit plans, in which the

¹ Although in principle one could transfer wealth from employees by terminating an underfunded pension plan, there is a cash flow loss from this termination. In practice, since firms face credit constraints and internal financing is scarce, terminations of underfunded plans are virtually nonexistent. (See Ippolito and James (1990).) Since our data set is based on reversions, it does not include terminations of underfunded pension plans.

² About 2% of plans were terminated per year in the 1980s (Petersen, forthcoming).

³ When reputational losses are smaller than the gains from breach, violating the contract benefits shareholders. If incumbent managers are reluctant to breach these contracts to serve shareholders, hostile acquirers who do not have a reputation to protect can do it for them.

level of benefits depends solely on the years of service (about 12% of all plans). Since unit-benefit plans contain a pension bond while flat-benefit plans do not, this evidence strongly suggests that the motivation for these reversions is, at least partially, to transfer wealth from workers to shareholders.

□ **Evidence on transfers from retired workers.** Firms can also transfer wealth from retirees through terminations. Many firms voluntarily offer their retirees cost-of-living adjustments. Estimates by Bankers Trust (1980) and by Allen, Clark, and Sumner (1986) show that COLAs are provided by two-thirds of the firms with defined-benefit plans and amount to an average of 50% of inflation. Although firms do not insure retirees completely, they typically pay more than their legal obligation. If a termination reduces these voluntary increases, it transfers wealth from retirees to shareholders. Of course, firms have the option of granting COLAs even after a termination. However, any firm that plans to grant these COLAs imposes a tax penalty on itself by reverting funds from the pension plan. Reversions would appear to be an optimal financial strategy only for firms that plan to grant smaller COLAs.⁴

Petersen (forthcoming) tests this view by examining the age distribution of workers in the plans that are reverted. He finds that plans are more likely to be terminated when they have a higher fraction of current retirees. His model predicts that the probability of reversion rises from .70% for a plan made up completely of nonvested workers to 6.10% for a plan made up completely of retirees. This evidence suggests that many of these reversions are associated with a decision to cut back on future voluntary COLAs.⁵

□ **Evidence on stock price reactions to reversions.** Considerable evidence from event studies on pension fund terminations also sheds light on the structure of the pension contract. Under the explicit-contracts view, when a plan is terminated both workers and firms receive what they would ultimately have received anyway. Even if a plan is overfunded, excess assets belong to the firm and hence no transfer between the workers and the firm is taking place in a termination. Under the implicit-contracts view, in contrast, a termination of an overfunded plan can breach the implicit contract and transfer the pension bond and the excess funds over the pension bond to the firm. As a result, shareholders benefit and workers lose from terminations, and terminations should occur where they benefit shareholders the most.

Alderson and Chen (1986), Haw, Ruland, and Hamdallah (1988), Hsieh and Ferris (1987, 1988), Mitchell and Mulherin (1989), Mittelstaedt and Regier (1989), and VanDerhei (1987) find that the market value of a firm terminating a pension plan rises on the announcement of termination.⁶ This suggests that the stock market in fact expects the firm to pay workers more than the explicit obligation, and is surprised to see the shareholders

⁴ There is no available direct evidence that firms with more overfunded pension plans are more likely to grant COLAs to their retirees.

⁵ Thomas (1988) also examines the age distribution of workers in reverting firms. He finds, as does Petersen, that there does not appear to be a difference between firms that revert and a control sample in the fraction of workers who are vested at the time of the reversion. However, he does not examine the fraction of retirees in his firms.

⁶ One study that does not find a stock price reaction to pension reversions is Bruner, Harrington, and Marshall (1987). Their result is most likely due to their use of the termination date rather than the filing date for most of their observations. Mitchell and Mulherin (1989) find that abnormal returns at the termination date are zero, while abnormal returns at the filing date are positive. Hsieh and Ferris (1987) find that abnormal returns are positive only for the subsample of their firms that are financially distressed. These authors use the actual termination date rather than the filing date, when the information presumably becomes public. Mitchell and Mulherin (1989) use the filing date and find positive returns even for the subsample of firms not experiencing financial distress or reorganization.

receive this cash. This stock price increase at the filing of the termination application can also be interpreted as signalling that the firm can use the reverted cash to invest in a positive net present value project. However, other events in which a firm raises funds for investment (equity issues, dividend reductions, etc.) are accompanied on average by a stock price decline.⁷ Jensen (1986) surveys these studies and argues that managers waste the free cash flow that they raise. In contrast to these studies, share prices rise on reversion announcements, indicating that the market expects the funds to be put to a use more in the shareholders' interest than it expected before the reversion. A plausible explanation is that the money would otherwise have gone to fund cost-of-living adjustments for workers' pensions.⁸

□ **Summary of the evidence.** Substantial evidence suggests that at least some component of pension payments is an implicit rather than explicit obligation. When companies terminate pension plans and provide workers with only the amount they are entitled to explicitly, they reduce the expected future payments to employees. If implicit contracts do not permit firms to revert this money but do require them to use it to fund benefit increases, then reversions constitute a breach of these contracts.

An alternative argument is that although reversions transfer wealth from employees, they are not a breach of an implicit contract, since rational workers understood when they accepted employment that reversions would occur in some circumstances. This argument is not persuasive. Consider reversions not connected with takeovers. Since the implicit contract should specify that reversions occur in bad states of the world when the firm cannot afford benefit increases, announcements of reversions should convey bad news about the prospects of the reverting firm, and so its market value should fall. Of course, we observe share prices rising on announcement.⁹ Another version of the anticipated reversions argument is that employees understand that reversions would occur after hostile takeovers. This version of the argument is equivalent to our story: Why does everyone expect reversions after hostile takeovers except if acquirers are willing to transfer resources from employees when managers are not? In the remainder of the article, therefore, we accept the implicit-contracts view of pensions and examine reversions following takeovers.

3. Data

■ Our data on tender offers come from Jarrell (1988). These data were collected through a computer search of the *Wall Street Journal* for all articles containing the words "tender offer" as well as the word "expires." The sample contains 413 successful tender offers, all of which were executed between March 1981 and May 1988. Jarrell (1988) classifies offers as "friendly" or "hostile" at both the beginning and the end of the offer period, with a

⁷ An exception is bank loans, which are typically accompanied by a positive stock price response (James, 1987). Bank loans, however, are different from the other forms of financing mentioned above because they provide information that a bank has determined the company to be a good risk, in addition to the information that the firm is planning to invest the money. No such monitoring is involved with pension terminations.

⁸ One employee agreed with this view of reversions when he testified at a recent Senate hearing (U.S. Senate Subcommittee on Labor, hearing on employer asset reversions from termination of pension plans, February 9, 1989): "I naively thought that the pension promise was forever and that the money in the fund would be used only for retirement benefits. I recognized that the plan wasn't automatically adjusted for inflation but expected that the company would voluntarily give adjustments to help preserve the purchasing power of my pension. The company has, in fact, recognized the impact of inflation and given us two adjustments, one in 1978 and one in 1981. I and other retirees thought another one was long overdue."

⁹ This result could alternatively mean that reversions signal to the market the increased likelihood of a takeover. But why would managers revert pension plans when they expect a takeover except if they think that one takeover motive for a potential acquirer would be to revert the plan?

written agreement between bidding and target management serving as the criterion for whether or not an offer is considered “friendly.” We classified as hostile all offers that were hostile during one period and friendly during the other, since written agreements are often signed in response to a hostile takeover threat.¹⁰

We matched the tender offer data to a list of all pension-plan reversions over \$1 million supplied by the Pension Benefit Guarantee Corporation (PBGC). We only consider pension-plan terminations involving reversions, since plan terminations not involving asset reversions occur very frequently, usually because the company wants to restructure the plan. Reversions occur when managements take the overfunded portion of a defined-benefit plan and use it for other purposes. The PBGC provides data on the dollar value of assets in the pension fund and the actuarial value of the benefits. The dollar value of the reversion is the difference between the two.

The PBGC data contain all 1,752 pension plans whose excess assets were reverted between May 31, 1980 (when the first reversion is documented) and June 26, 1988, as well as 50 reversions that were pending at that time. We matched the firms from the tender offer database to the PBGC list of reversions. Since corporations often have subsidiaries with their own pension plans, some corporations are listed more than once in the PBGC data. To avoid counting the same firm twice, we count all the plans from one firm as one observation, except in three cases in which a firm had plans reverted both before and after the merger announcement. In these cases the reversions were done by different managements, so we count each of those firms as two observations. To find information on any cases in which a parent company’s plan was not reverted but those of some or all of its subsidiaries were, we examine *The Million Dollar Directory* and *Who Owns Whom*. We find 24 subsidiaries whose pension assets were reverted, giving us a total of 72 firms comprising 100 plans. Finally, some of these reversions occurred several years away from the takeover and so cannot be reliably interpreted as connected to it. To focus on reversions that are likely to be related to takeovers, we restrict the sample to reversions that occur within two years of the takeover.¹¹ We do so because we are most interested in the reversions as potential breaches of implicit contracts immediately following the takeover and as takeover defenses preceding it. This restriction leaves us with a total of 62 observations, 18 of which occur before the takeovers and 44 of which occur afterward.

For some of the empirical analysis, we use a database taken from the Form 5500 that each firm with a pension plan must file with the Internal Revenue Service.¹² Since the Form 5500 data are organized by employer identification number, we gather employer identification numbers for each firm in the Comment and Jarrell (1987) data. Subsidiaries were identified through *Who Owns Whom* and likewise matched to the Form 5500 list. This procedure provided us with 540 employer identification numbers corresponding to 347 target firms.

All defined-contribution plans and defined-benefit plans with missing data were eliminated from the sample, leaving us with 883 plans from 67 hostile and 127 friendly targets. Finally, since we cannot identify terminations of underfunded plans from the PBGC data, we eliminated all underfunded plans, leaving us with 556 plans from 60 hostile and 101 friendly targets.

¹⁰ Comment and Jarrell (1987) provide more detail on how the offers were classified.

¹¹ Most terminations are not announced in the *Wall Street Journal*. Our event date for the termination is the filing date with the PBGC rather than the date the termination actually occurs. Mitchell and Mulherin (1989) find that stock prices of terminating firms rise on the filing date and not on the actual termination date, indicating that for most terminations, the information becomes public knowledge around the time of the filing. For ten firms, we could not get information on the filing date and so use the termination date as the event date.

¹² We thank Mitch Petersen for providing us with the Form 5500 data.

To identify which plans reverted, we compare funding ratios and numbers of participants from the PBGC list and the Form 5500 list. We identify 13 plans reverting after hostile takeovers and 10 plans reverting after friendly ones.¹³

Daily return and stock price data are obtained from CRSP (Center for Research in Security Prices) for firms on NYSE and NASDAQ. For the firms on AMEX and on OTC but not NASDAQ, we hand-collect returns and shares data from *The Daily Stock Price Record*.

4. Pension reversions and hostile and friendly takeovers

■ Table 1 describes the incidence of pension asset reversions for our sample of 413 takeovers. It presents evidence on the reversions that occurred within the two years before the acquisition date as well as those that occurred within the two years afterward. We examine reversions occurring before the acquisition on the theory that some of them might be defensive. Defensive adjustments could occur if management chooses to transfer the wealth from the employees rather than let the acquirer do it for them. Finally, we contrast the reversions for hostile and friendly acquisitions, under the hypothesis that hostile takeovers are more likely to lead to breach of implicit contracts.

The results show that pension fund reversions within the two years before the acquisition are rare (4.6% of acquired firms). Such reversions, however, occur more than twice as often in future targets of hostile takeovers than in future targets of friendly acquisitions (7.2% versus 2.9%). This difference is statistically significant from zero at conventional levels (z -statistic = 2.01, p -value, = .02).¹⁴ One interpretation of this result is that managers withdraw excess pension assets as a preemptive defense when they (correctly) fear a hostile takeover.

TABLE 1 Incidence of Pension Asset Reversions Around The Time of Takeovers

Takeover Type	Total Takeovers	Number (Percent) Reverting	Number (Percent) Reverting By Time Period ^a	
			Within Two Years Before Takeover	Within Two Years After Takeover
Friendly	274	30 (10.9)	8 (2.9) ^c	23 ^b (8.4) ^d
Hostile	139	29 (20.9)	10 (7.2)	21 (15.1)
Total	413	59 ^e (14.3)	18 (4.6)	44 (10.7)

^a The time period is computed by comparing the date of the acquisition to the filing date listed by the PBGC.

^b The numbers do not add across rows because some firms have more than one plan reverted. When all of a firm's plans are reverted either before or after the takeover, we include the firm into that category, but when reversions occur both before and after the takeover, we include the firm in both categories.

^c The z -statistic for the difference between the friendly and hostile subsamples in the proportion of pension plans reverted is 2.01, which indicates the difference is significantly different from zero at the 5% level.

^d The z -statistic for the difference between the friendly and hostile subsamples in the proportion of pension plans reverted is 2.09, which indicates the difference is significantly different from zero at the 5% level.

^e The total number of firms with reversions does not add to the sum of those reverting before and after the takeover because there were three firms that reverted both before and after the takeover that were included in both categories.

¹³ Out of the 194 firms with plan data, we cannot identify the specific plan that reverted for six hostile targets and five friendly.

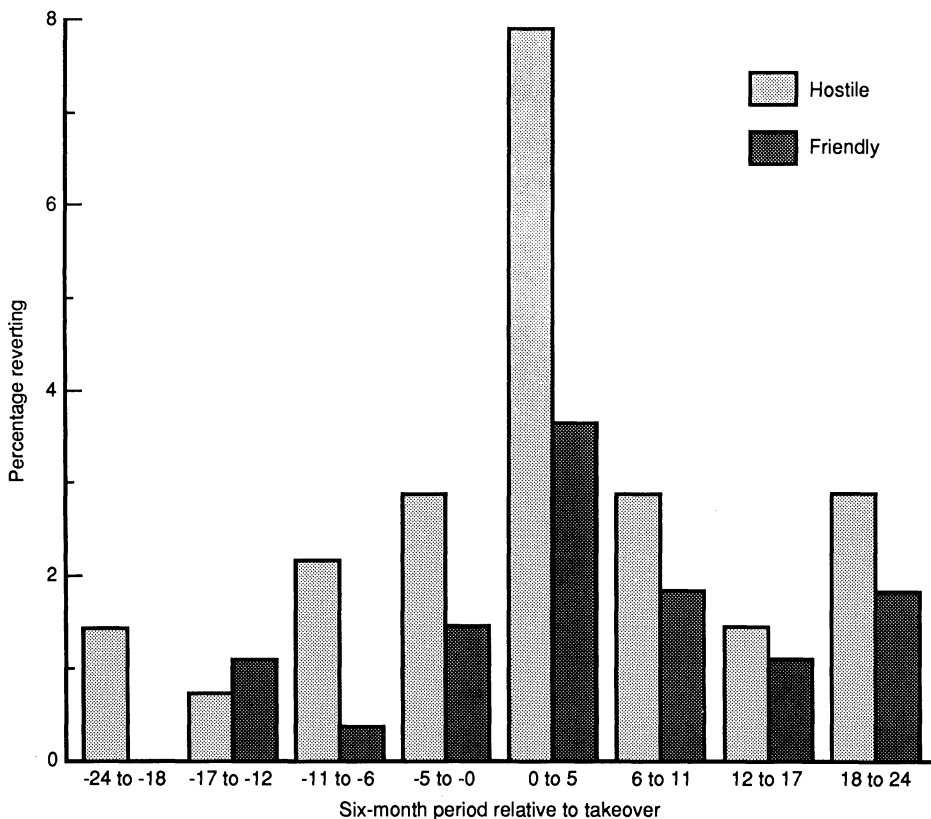
¹⁴ The z -statistics here and below are computed using a test of the significance between two proportions discussed in Harnett (1982).

Table 1 also shows that within the two years following an acquisition there are more than twice as many reversions as within the two years before the acquisition. In targets of both hostile takeovers and friendly acquisitions, the pace of reversions is stepped up considerably following the change of control. Part of the explanation is probably the integration of the pension plan of the target company with the pension plan of the acquirer, accompanied by the termination of the former plan.¹⁵ No transfer needs to occur in such a case. These integrations are one reason why we compare the number of terminations in hostile takeovers to friendly ones—integrations are likely to be just as common with friendly takeovers as with hostile ones. A plausible explanation of this difference in reversion rates is the abrogation of implicit contracts following hostile takeovers.

Consistent with the last possibility, Table 1 shows that 15.1% of the targets of hostile takeovers have their pension plans terminated within two years of the acquisition, compared to only 8.4% of the targets of friendly deals (z -statistic = 2.09, p -value = .02).¹⁶ The higher incidence of terminations after hostile takeovers lends support to the claim of Shleifer and Summers (1988) that such terminations breach implicit contracts with employees and that managers resist control changes that later lead to breach.

Figure 1 summarizes the timing of reversions around the date of the acquisition for hostile and friendly takeovers. For hostile deals, there is a step-up of reversions in the year prior to the acquisition. This appears to be evidence of defensive terminations that occur

FIGURE 1
THE TIMING OF REVERSIONS RELATIVE TO TAKEOVERS



¹⁵ It is impossible to tell from available data which terminations were integrations of plans.

¹⁶ This result was discovered independently by Mittelstaedt (1989).

when management fears that an overfunded pension plan could attract a hostile takeover. This number is an underestimate of the true number of defensive restructurings, since it does not include defensive terminations that were successful in warding off a hostile acquirer. For example, Union Carbide terminated its plan as part of its successful takeover defense against GAF (*Wall Street Journal*, August 29, 1985), and United Airlines reportedly terminated its plan to make itself a less desirable takeover target (*Wall Street Journal*, September 11, 1985).¹⁷

Table 1 and Figure 1 reveal large differences between the incidence of reversions after hostile and friendly acquisitions. This difference is consistent with the view that hostile takeovers are associated with wealth transfers from workers. However, there are other differences between the friendly and hostile targets that offer potential explanations for the differences in reversion rates. In particular, hostile targets tend to be larger and thus prone to having more plans. Firms with more overfunded plans will have a greater chance of having at least one reverted. Using the Form 5500 data, we control for these factors by including the number of overfunded pension plans, firm size, and a dummy variable that indicates whether the firm is a hostile target in an equation that predicts whether any plans are reverted for a given firm.¹⁸ We also control for time differences, since starting in 1986 a 10% excise tax on reversions was enacted and the total number of reversions declined (Petersen, forthcoming).

The results using firm-level data are shown in the first two columns of Table 2. The coefficient on the hostile dummy variable is positive and significantly different from zero at the 5% level. The coefficient on the hostile dummy indicates that the probability of a reversion is 18% larger for hostile targets than for friendly targets before 1986. After 1986, however, there is little difference (the difference for this period is equal to the sum of the coefficient on the hostile dummy plus the coefficient on the interaction term). This result suggests that before 1986, when reversions were a tax-advantaged way of transferring funds from workers, acquirers in hostile takeovers took advantage of this option. After the tax on reversions was passed, reverting became tax-dominated by a slow withdrawal of the funds combined with a termination of a fully funded plan (which we would not observe, since we only observe reversions in excess of \$1 million). Reverting becomes optimal only for firms that are capital-constrained and are willing to pay the tax on reversions in order to get the cash right away. Given this, we would expect no differences between hostile and friendly acquisitions unless hostile acquisitions are characterized by a greater demand for funds than friendly acquisitions. The fact that we find no differences after 1986 suggests that the differences between hostile and friendly acquisitions are not driven by differences in the demand for funds.

An alternative way to do the estimation is to use plan-level data. This method allows us to control for characteristics of the plans, such as the funding ratio. These equations are shown in the third and fourth columns of Table 2. Again, the coefficient on the hostile dummy is positive and significant (at the 10% level) for the pretax period but very close to zero and insignificant for the posttax period. There appears to a funding ratio effect—the probability of reversion increases with the funding ratio (see also Thomas (1988) and Petersen (forthcoming)).

An additional test of the wealth transfer motive is to compare the types of plans that

¹⁷ So-called Pension Parachutes are becoming increasingly common (*Pension and Investment Age*, December 22, 1986) and are greeted with an average negative 2% three-day abnormal price decline (Mitchell and Mulherin, 1988). The fact that measures designed to prevent acquirers from reverting assets have a stock price reaction similar to other takeover defenses provides additional evidence that pension reversions are a motivation for hostile takeovers.

¹⁸ We use the log of the number of plans rather than the number itself, since the distribution of plans is very skewed. When we use the number of plans itself, the coefficient on this variable drops but all the other coefficients are essentially unaffected. We estimate the equations using both a linear probability model and logit. The results are qualitatively the same.

TABLE 2 Estimated Equations Predicting Reversions

Sample: 194 firms that were taken over between 1981 and 1988, containing 556 overfunded pension plans				
Unit of Observation	Firm Level ^a		Plan Level ^b	
Estimation Method ^c	OLS	LOGIT ^d	OLS	LOGIT
Constant	-0.194 (-1.16)	-0.519 (-2.72)	-0.033 (-0.96)	-0.377 (-7.19)
Hostile Dummy	0.180 (2.29)	0.131 (2.22)	0.046 (1.76)	0.078 (1.71)
Funding Ratio	—	—	0.040 (2.01)	0.047 (2.42)
Log of One Plus the Number of Overfunded Plans	0.061 (1.72)	0.052 (1.58)	—	—
Dummy if Merger is After 1986	-0.030 (-0.51)	-0.034 (-0.49)	-0.001 (-0.04)	-0.007 (-0.10)
Hostile <i>X</i> After 1986	-0.218 (-2.02)	-0.171 (-1.42)	-0.050 (-1.50)	-0.094 (-1.06)
Log of Market Value	0.023 (1.58)	0.020 (1.24)	—	—
<i>R</i> ²	0.095	—	0.027	—
Log Likelihood	—	-78.25	—	-90.18
Observations	194	194	556	556

^a Dependent variable is 1 if at least one plan reverted within two years following a takeover, 0 otherwise.

^b Dependent variable is 1 if the plan reverted within two years following a takeover, 0 otherwise.

^c For OLS estimation, heteroskedastic-consistent *t*-statistics are in parenthesis. Asymptotic *t*-statistics are similarly presented for logit estimation.

^d In the logit equations, we report $\frac{\partial \text{Prob}(\text{Reversion})}{\partial x_i}$ for each variable, evaluating all independent variables at their means. Conventional logit parameters can be calculated by multiplying reported firm-level parameters by 8.298 and plan-level parameters by 11.588.

revert. In unit-benefit plans, which comprise 417 of the plans in our sample, pension benefits are a function of final wages, while in the 66 flat-benefit plans, benefits are just a function of years worked.¹⁹ Therefore, there is a pension bond with a unit-benefit plan but not with a flat-benefit plan. Seventy-three of our plans are neither unit nor flat; these plans generally have a pension bond as well, but it is not as large as in a unit-benefit plan. The wealth-transfer hypothesis predicts that the plans that will be reverted are the ones in which the pension bond is the largest; in particular, it predicts that unit-benefit plans are more likely to be reverted than flat-benefit plans. This prediction is confirmed in our sample. Of the 23 reversions we can identify in the Form 5500 sample, 19 are unit-benefit plans, 4 are in the “other” category, and none of the plans are flat-benefit plans. The difference in the proportion of unit-benefit plans that revert relative to flat-benefit plans is significant at the 5% level.

Ideally we would like to include these variables in the equations that predict reversions so that we can control for the other explanatory variables. However, since we do not observe any flat-benefit plans reverting, the likelihood function becomes flat when plan types are included in the equation. Instead, we reestimate the model in the fourth column of Table 2 on the 490 plans that are not flat-benefit plans.^{20,21} Using this estimated model, we

¹⁹ See Petersen (forthcoming) for more discussion of the differences between plan types.

²⁰ We are extremely grateful to Bruce Hansen for suggesting this procedure.

²¹ The estimated probability is $\frac{\exp(x\beta)}{1 + \exp(x\beta)}$, where $x\beta = -4.16 + .829*\text{hostile dummy} + .537*\text{funding ratio} - .158*\text{post-1986 dummy} - 1.058*\text{hostile dummy}*\text{post-1986 dummy}$.

compute the probability that each of the 66 flat-benefit plans is reverted, under the assumption of no differences across plan types. Finally, we calculate the probability that given these probabilities we would observe none of these plans reverting. For our sample, we estimate this probability (the p -value) as .06. This result suggests that the probability of reversion for unit-benefit plans is higher than for flat-benefit plans. This difference implies that the decision to revert is at least partly motivated by transferring wealth from workers. This result is not consistent with the argument that the only reason reversions are more common following hostile takeovers than friendly ones is that in the former case, the demand for financing is greater.

5. Explaining the takeover premia

■ We have documented that pension reversions typically involve a wealth transfer from employees to employers. We have also documented that these reversions are about twice as common following hostile takeovers as following friendly ones, and much more common following either type of takeover than for firms not involved in a control change. What is not clear from these calculations, however, is the magnitude of the wealth transfers. In particular, can pension fund reversions explain a significant part of the takeover premium? For this question to be meaningful, it must be the case that reversions following takeovers are anticipated at the time the bid is made, and therefore the expectation of the reversion is incorporated into the premium. If reversions are unanticipated, in contrast, there is no sense in which the premium should reflect the reversion. We can test whether the reversion is anticipated by comparing announcement-date abnormal returns of terminating firms in takeovers and in noncontrol situations.

Studies of reversions not following takeovers find that on the announcement of the reversion—the date on which the firm applies to the PBGC for permission to terminate its plan—the stock price of the terminating firm usually rises. The size of the abnormal return varies across studies; Mitchell and Mulherin (1989) find that it equals .45% on the three-day interval around the filing date, and Haw, Ruland, and Hamdallah (1988) find a 4.75% increase on the corresponding period for their sample.²² For post-takeover terminations we were able to perform the corresponding event study for 20 hostile and 3 friendly firms. (Many acquirers, particularly the friendly ones, were private, and 6 of the acquirers had missing data). For the hostile acquirers, the average three-day abnormal return was $-.08\%$ and the median was $-.4\%$. Among the 20 firms, 8 returns were positive. For the friendly ones, the average return was $-.29\%$ and the median return $-.31\%$, and only one of the three returns was positive. This evidence suggests that terminations following takeovers are anticipated, in contrast to other terminations.²³ Under the efficient markets hypothesis, the results imply that expected shareholder benefits from terminations should enter the takeover premium.

Documenting the magnitude of transfers from reversions is difficult. Wealth transfers from current employees depend on the details of the pension plan, as well as the age distribution of workers and expectations of future wage growth. Wealth transfers from retirees depend on their number, as well as inflation expectations and the future COLAs. We do not have the data on any of these variables. However, under the assumption that funding levels are set at least in part to pay for the implicit portion of pension liabilities, a rough

²² Alderson and Chen (1986) document a 9.55% increase on the 70 days around the termination date. These authors do not have data on the filing date, so use a long event window in the hope of capturing the release of information.

²³ Ancillary evidence also supports this finding: Pantry Pride announced publicly that it would terminate Revlon's pension to retire takeover-related debt before it actually acquired Revlon (*Wall Street Journal*, August 27, 1985).

estimate of the wealth transfer can be derived from the relationship between the market reaction to a reversion and the size of the reversion. This estimate provides some insight into the relative magnitudes of wealth transfers and takeover premia.

We first perform an event study of target shareholders' wealth changes around the announcement of the takeover. To compute excess returns, we calculate the return on the company's stock over the event window and subtract the return on the *Standard and Poor's Index* over the same period.²⁴ Target returns in the two-day window around the takeover announcement are significantly lower than the returns computed beginning a month before the announcement and ending at the time of the acquisition. The average return in the two-day window is 12.6%, compared to 34.2% for the longer window. Part of the difference is anticipation effects, and part is undoubtedly due to increases in the bid and to initial uncertainty over its likely success. In this article we always use the long interval to compute returns, and by doing so we bias the results against finding high ratios of pension reversions to takeover premia. To compute the dollar value of the change, we multiply the excess return by the market value of the company's stock 20 trading days before the announcement. The average dollar value of the excess returns is \$312 million.

In Table 3, we present evidence on the ratio of the pension fund reversion to the takeover premium. To compute this ratio, we do not discount the value of the reversions that take place several months after the acquisition. The numbers in Table 3 also do not take account of the fact that pension reversions are taxable. If the firm is taxable, the appropriate number to compare to the takeover premium is the after-tax value of the reversion, which can be as low as half of the pretax value. Last and most important, pension funds are transfers from employees only insofar as the market believes initially that the excess funds will eventually go to the employees. A reversion cannot be counted as a source of takeover gains if the market has always thought that it is the property of the shareholders. These three effects suggest that the numbers in Table 3 are upper bounds on the actual fraction of the takeover premium that can be accounted for by transfers from employees

TABLE 3 Reversion Amounts as a Fraction of the Takeover Premium and as a Fraction of the Pension Assets

	Mean (Median) Value Of Reversion (in \$m)	Mean (Median) Value Of Reversion as Fraction Of Premium Paid ^a	Mean (Median) Value Of Reversion as Fraction Of Pension Assets
Friendly (23 Obs.)	13.0 (6.9)	.29 (.19)	.39 (.35)
Hostile (21 Obs.)	44.1 (12.2)	.37 (.21)	.44 (.40)
Total Takeover Sample (44 Obs.)	27.8 (8.1)	.33 (.21)	.41 (.37)
Total Reversion Sample (1730 Obs.)	10.3 (2.5)	—	.47 (.46)

^a The premium paid is the dollar value of the market-adjusted return from 20 days before the takeover until the day the bid is ultimately accepted.

²⁴ The reason we perform the event study this way rather than by estimating a market model is that eight of our targets do not have returns data in machine-readable form. By not estimating market-model parameters, we can reduce considerably the process of hand-collecting returns data. Brown and Warner (1985) provide evidence suggesting that any bias resulting from this approach is not severe.

to shareholders. Below we provide some estimates of the fraction of the reverted assets that should appropriately be compared to the takeover premium.

Table 3 shows that the mean ratio of reversion to takeover premium is .29 in friendly acquisitions and .37 in hostile ones. These two ratios are not statistically significantly different from each other. The median ratios are even closer to each other than the means (.19 versus .21). These estimates of the average ratio of the reversion to the takeover premium are consistent with the results of Mitchell and Mulherin (1989), who find that the average ratio of the reversion to the *acquisition price* is 7.3% for a sample of 34 takeovers. If one thinks of reversions as transfers, it is obviously more natural to consider the ratio of reversions to takeover premia. Assuming a takeover premium of 30%, the Mitchell and Mulherin number implies that reversions average 32% of the takeover premium. This is very close to our estimates.

To gauge the magnitude of the wealth transfers, we need an estimate of the relation between funding levels and wealth transfers. We use the evidence of Haw, Ruland, and Hamdallah (1988), who estimate a coefficient of about .35 in a regression of the abnormal announcement date return on the ratio of the reversion amount to the market value of the firm. This estimate is equal to the share of the excess pension assets that the market expects would have gone to the employees in the absence of a reversion, corrected for the tax on the reversion at the corporate level. If we take the ratio of the reversion to the change in market value of the terminating firm to be .35 as well, then 10% of the premium for friendly takeovers and 13% of the premium for hostile takeovers can be attributed to wealth transfers from employees through pension reversions.

6. Conclusion

■ This article has evaluated pension fund reversions following takeovers. We found that plan terminations rise significantly after acquisitions and are more frequent after hostile than after friendly deals. The results are consistent with the view that transfers from stakeholders are a source of gains in hostile takeovers. The frequency of reversions is much higher for hostile takeovers than for friendly takeovers. This difference disappears after 1986, when reversions stopped being the tax-preferred way of transferring wealth from workers. Reversions following takeovers occur primarily in unit-benefit pension plans, where the potential for wealth transfers is the greatest. We estimate that wealth transfers from pension fund reversions on average account for 10% to 13% of the takeover premium in the cases where they actually occur. On average, pension fund reversions are too small to be the sole, or even the dominant, takeover motive.

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