Market Reaction To Firm Inclusion On The Pension Benefit Guaranty Corporation Underfunding List

Norman H. Godwin, (godwin@business.auburn.edu), Auburn University
Kimberly G. Key, (E-mail: kkey@business.auburn.edu), Auburn University

Abstract

This study investigates stock market reaction to a firm's inclusion on the Pension Benefit Guaranty Corporation's (PBGC) "Top 50" list of firms with the most underfunded pension plans. The PBGC's use of the list to put pressure on firm managers to increase pension funding has been controversial. Abnormal returns calculated around press release dates are not statistically significant, inconsistent with the PBGC's implicit goal of having third parties exert pressure on firm managers to increase funding. However, for one list that is reported by The Wall Street Journal, reaction is statistically positive. The positive reaction is consistent with the theory that firms with underfunded pension obligations have a put option with respect to the PBGC.

Introduction

Established by Title IV of the Employment Retirement Income Security Act of 1974, the Pension Benefit Guaranty Corporation (PBGC) is a government-sponsored corporation charged with protecting the retirement income of employees whose employers sponsor defined benefit pension plans. Over 55,000 plans covering more than 42 million workers are currently under the corporation's scrutiny (PBGC, 1996). To aid in carrying out its charge, the PBGC began a public campaign in 1990 to "stem the increase in pension funding before (there is) a crisis" (PBGC, 1991). This campaign consisted of the publication of a list containing the fifty firms with the largest underfunded pension obligations guaranteed by the PBGC. Since 1990, the PBGC has issued a total

of eight lists, many of which have been published in their entirety by various financial press outlets.¹

The PBGC list has been quite controversial. PBGC news releases indicate clearly the agency's belief that underfunding is a serious problem. One source even maintains that the reported underfunding could understate potential claims against the PBGC (Burr, 1992). However, managers of firms on the list generally consider the PBGC assumptions used in benefit calculations far too pessimistic (*The Wall Street Journal*, February 4, 1993). Others consider the list extremely misleading, labeling it the "iffy fifty" (Vise, 1993) and a "gimmick" (Brostoff, 1997). Still others believe it causes needless anxiety among retirees of listed firms that outweighs any benefits of the list (Fisher, 1991). Despite such continual criticism from the private

Readers with comments or questions are encouraged to contact the authors via e-mail.

sector, the PBGC maintained its position concerning the state of pension funding.

This study investigates stock market reaction to a firm's inclusion on the list. The study attempts, in part, to resolve discrepancies among the divergent opinions regarding the relevance of the PBGC underfunding information by providing empirical evidence on market participant perceptions of a firm's inclusion on the list. More important, the study addresses Blankley and Tang's (1995) call for an examination of whether there is a market penalty for the firms with the most severely underfunded pension plans. A market penalty potentially accrues to listed firms because of the potential political costs resulting from increased scrutiny from regulators, creditors, labor unions, and other groups. The PBGC's goal to "put more pressure on these companies to better fund their pension plans" (PBGC, 1992) suggests that the PBGC believes that political costs can result from its list and that avoidance of such costs will motivate firm managers to increase funding. A negative stock market reaction to firm inclusion on the list is consistent with market participants perceiving that inclusion on the list increases the likelihood of political costs being incurred by list firms.

To assess market reaction to the list, abnormal returns are calculated around PBGC press release dates using standard event-study methodology. The calculated returns vary in sign, and none are significantly different from zero, suggesting that the market does not consider the PBGC information relevant to firm value. However, the abnormal return calculated around the date that the November, 1992, list is published in *The Wall Street Journal* is significantly different from zero, which indicates the PBGC information is relevant in assessing firm value. This result also suggests that the market impounds information from selective sources, of which the PBGC annual press releases are not included.² Unexpectedly, the abnormal return around the *Journal's* coverage is positive, which is inconsistent with a market penalty.

Why did the market react positively to the list covered in *The Wall Street Journal*? Bicksler and Chen (1985) describe the PBGC insurance for defined benefit pension plans as a put option, meaning that for certain high levels of underfunding a firm can "put" the pension liabilities onto the PBGC by transferring 30% of the firm's net worth to the PBGC. The value of the put increases as either pension assets decrease or pension obligations increase. The positive stock market reaction around the *Journal's* coverage is consistent with market participants valuing the pension put option of listed firms. To generate further evidence with respect to this explanation, abnormal returns for those firms covered in the *Journal* are regressed onto three proxies for the value of the pension put option. Regression results indicate that abnormal returns were higher for those firms with persistent underfunding and for those firms whose pension obligations exceeded 30% of net worth. Thus, there is some support for the pension put explanation.

Despite long-standing defense of the Top 50 list as a mechanism to improve pension funding, in September, 1997, the PBGC announced its decision to discontinue publication of the annual list (PBGC, 1997). The press release states that recent laws provide new enforcement tools, so the list is no longer needed. The results of this study are not at odds with the PBGC decision. The public manner in which the PBGC has identified firms with underfunded plans is consistent with the PBGC believing that outside parties will use the information to apply pressure on managers to increase funding. While this study cannot provide evidence with respect to all outside parties, it can provide evidence on perhaps the most important external constituent, the shareholder. The positive shareholder reaction to the list cannot be interpreted as reinforcing the PBGC funding goals; rather, the reaction suggests that the PBGC is wise to direct scarce agency resources to more effective means of increasing pension funding.

The remainder of the paper is organized as follows. The next section explains applicable pension funding data provided by the PBGC and listed firms. Differences between the two sources exist because of certain assumptions made by the PBGC. Descriptive data are also provided. The following sections describe the abnormal return calculations, discuss the positive stock market reaction and the pension put theory, and present conclusions. Finally, suggestions for future research are provided.

The PBGC List and Pension Data

Each year, the PBGC examines the pension plans it insures and releases a listing of the fifty firms with the lowest ratio of plan assets to vested benefit obligations (hereafter, funding ratio) for the year under scrutiny. The PBGC gathers most of the information for its examination from public sources, including Compustat, annual reports, and Form 5500, "Annual Return/Report of Employee Benefit Plan," filed with the IRS. Because of the delay in obtaining data from these sources, the PBGC generally releases its list well after the year-end under scrutiny. For example, the first list released in May 1990, contained pension information as of 12/31/88. The next two lists, containing information as of 12/31/89 and 12/31/90, were released in February and November of 1991, respectively. From that point on, the PBGC released information for a given year-end in the following November or December, resulting in a total of eight lists released from 1990 to 1996 that provide pension information for the years 1988 through 1995. Except for the first list, which lists firms alphabetically, firms are listed in order of their funding ratios from lowest to highest.

The vested benefit obligation (VBO) used in the PBGC's funding ratio is one of the three pension liability measures reported by firms under the requirements of Statement of Financial Accounting Standards No. 87, "Employers' Accounting for Pensions" (FAS 87). The

VBO is used by the PBGC in lieu of the other two measures required by FAS 87, the accumulated benefit obligation and the projected benefit obligation, because the PBGC's potential obligations are based only on vested benefits. The PBGC reports the total vested obligation for only those plans whose VBO exceeds plan assets. In cases where a firm has both underfunded plans and overfunded plans, the PBGC does not combine plans and report the net vested obligation, for neither the PBGC nor participants of the underfunded plans have any legal right to claim the assets of the overfunded plans. Thus, underfunded plans are disclosed separately because they represent a risk to the PBGC, even when the firm is fully funded when all its plans are aggregated. Because the firm-reported value of vested benefits depends on the firm discount rate assumption for the pension plan, the PBGC also adjusts vested benefits for each plan using a single, constant discount rate. This adjustment removes any variation in funding ratios that results from variation in plan assumptions across firms.

The discount rate chosen by the PBGC normally is well below the range of discount rates chosen by firms, resulting in higher values of vested benefits and consternation by affected firms (*The Wall Street Journal*, 2/4/93).

Comparisons of PBGC data with firm disclosures are often difficult because of the discount rate adjustment and the inclusion of only underfunded plans on the PBGC list. Although firms must separately disclose in their annual reports aggregate underfunded plans and aggregate overfunded plans, funded status is determined by comparing plan assets and the projected benefit obligation, which is ordinarily larger than the VBO. Therefore, an underfunded plan as determined and disclosed under FAS 87 can actually have plan assets in excess of vested benefits.

Depending on the size of the excess and the effect of the PBGC's discount rate adjustment, the plan may or may not be included on the PBGC's list.

Table 1 contains descriptive information on the eight lists published by the PBGC from 1990 to 1996. Panel A reports the dollar amount of underfunding reported by the PBGC for each year. Aggregate underfunding for listed firms increased steadily through the 1993 list, decreased fairly dramatically in 1994, and then increased again in 1995. Perhaps most striking is the size of the liability for the firm with the maximum underfunding. In both 1992 and 1993, one firm had underfunding in excess of \$15 billion, which was approximately half of each year's aggregate underfunding. Panel B of Table 1 reports the frequency with which firms appear on the list. A total of 119 firms have appeared on the eight lists. While roughly half of those firms appear on only one or two lists, six firms appear on all eight lists. Panel C reports

the eight SIC codes that have been represented at least ten times on the eight lists. PBGC news releases state that listed firms are not necessarily in financial trouble; however, these eight industries generally can be characterized as having experienced financial difficulties in the past decade.

One reason for the large underfunding reported by the PBGC in Table 1 is the discount rate used by the PBGC to adjust pension obligations. Table 2 reports discount rate data for both the PBGC and listed firms.³ The yearly discount rate used by the PBGC to adjust pension obligations is reported in the second column. These rates correspond to mortality assumptions made by the PBGC. Beginning in 1992, the PBGC changed mortality assumptions, resulting in

lower discount rates. As seen in the Table, the PBGC rate is lower than the firm mean and median in each year. In fact, the PBGC rate is lower than the firm minimum in seven of eight years. Only in 1994 is the firm minimum (7.10%) lower than the PBGC rate (7.15%). As mentioned previously, such low discount rates have been a point of contention among listed firms.

The effect of the PBGC discount rates is evident in the funding ratios reported in Table 3. Column 2 reports the average adjusted funding ratio for listed firms as

Table 1
Descriptive Information of Listed Firms

Panel A: Amount of Underfunding Reported by the PBGC
(in millions unless noted)

Year	Mean	Minimum	Median	Maximum	50 Firm Aggregate
1988	\$269	\$44	\$104	\$2,628	\$13.5 bil
1989	\$284	\$32	\$87	\$2,895	\$14.2 bil
1990	\$437	\$47	\$103	\$7,145	\$21.4 bil
1991	\$485	\$45	\$109	\$9,291	\$24.2 bil
1992	\$633	\$79	\$162	\$17,195	\$31.7 bil
1993	\$647	\$86	\$195	\$15,907	\$32.3 bil
1994	\$217	\$47	\$98	\$1,692	\$10.9 bil
1995	\$421	\$120	\$265	\$2,677	\$21.0 bil

Panel B: Frequency of Appearance

Number of times on a list	8	7	6	5	4	3	2	1	
Number of firms	6	9	9	12	11	18	22	32	119

Panel C: Most Frequent SIC Codes

SIC Code	Description	Number of firm years
2621	Paper Mills	12
3011	Tires and Inner Tubes	13
3312	Blast Furnaces and Steel Mills	60
3334	Primary Aluminum	16
3711	Motor Vehicles and Car Bodies	24
3714	Motor Vehicle Parts and Accessories	26
3720	Aircraft and Parts	15
4512	Air Transportation, Scheduled	21

Table 2
Annual PBGC Assumed Discount Rate and Firm-reported Rates
(number of observations for firm data)

Year ¹	PBGC ²	Firm mean	Firm Low	Firm median	Firm high
1988 (n=37)	7.75%	9.16%	8.00%	9.00%	10.00%
1989 (n=34)	7.25%	8.89%	8.00%	9.00%	9.50%
1990 (n=34)	7.25%	9.02%	8.00%	9.00%	10.00%
1991 (n=31)	7.70%	8.87%	8.25%	8.75%	10.00%
1992 (n=35)	6.40%	8.58%	7.75%	8.50%	9.50%
1993 (n=33)	5.65%	7.53%	6.75%	7.50%	8.80%
1994 (n=29)	7.15%	8.47%	7.10%	8.50%	9.30%
1995 (n=26)	5.30%	7.38%	6.75%	7.25%	8.25%

¹ 1988 through 1990 interest rates are calculated from firm disclosures collected using Lexis/Nexis. Compustat began reporting this data for 1991, so 1991 through 1995 data are from Compustat.

² The PBGC discloses interest rates that correspond to specific mortality tables. Therefore, the rates are not directly comparable across years. The 1988 through 1990 rates correspond to the UP-84 mortality tables, and 1991 through 1995 rates correspond to GAM-83 mortality tables.

reported by the PBGC. For those firms with available pension data, columns 3 through 6 report the adjusted funding ratio as reported by the PBGC and the funding ratio for underfunded plans as reported by the firms themselves. The mean (median) PBGC funding ratio is lower than the mean (median) firm funding ratio in all years. This finding is consistent with the interest rate differences and illustrates the listed firms' potential frustration with the PBGC's adjustment process. Interestingly, the maximum firm-reported funding ratio equals or exceeds 100% in seven of the eight years.

Market Reaction

Blankley and Tang (1995) call for an examination of the firms with the most severely underfunded pension plans to determine whether the market penalizes those firms. The PBGC publication provides a unique opportunity to test for the existence of such a penalty because the PBGC information is released on an identifiable date. A negative market reaction is consistent

with a market penalty.

Market reaction is tested using standard event-study methodology. First, the following market model is estimated for each firm:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \quad (1)$$

where:

R_{it} = rate of return for firm i on day t , R_{mt} = rate of return for the market on day t , and t = day -260 to -10 where day 0 is the day of the PBGC's press release.

Next, the slope and intercept parameters from the estimation regres-

sion are used to calculate daily abnormal returns during the event period as follows:

$$AR_{it} = R_{it} - (\alpha_i + \beta_i R_{mt}) \quad (2)$$

To test for statistical significance, firm-specific abnormal returns are standardized by dividing by the standard deviation of the market model residuals from the estimation period regression for that firm. The standardized abnormal returns for the day preceding the PBGC's press release ($t=-1$) and the day of the release ($t=0$) are then summed to obtain a two-day abnormal return for each firm, which is then further standardized by dividing by the square root of the number of days in the event period. These two-day standardized abnormal returns for each firm are then summed across firms. In the absence of any abnormal market performance unrelated to the PBGC information, dividing this sum by the square root of the number of firms in the sample produces a test statistic that is distributed in a unit normal fashion.⁴

Table 3
Guaranteed Funding Ratios Calculated and Reported by PBGC and
Firm-reported Funding Ratios Calculated from Compustat Financial
Statement Data (rounded to nearest single digit)

Year	PBGC List 50 firm aggregate	Mean	Mini- mum	Median	Maxi- mum
1988 PBGC	77%	66%	28%	69%	94%
Firms (n=42)		72%	31%	75%	102%
1989 PBGC	77%	66%	18%	73%	95%
Firms (n=36)		74%	35%	76%	105%
1990 PBGC	75%	68%	6%	78%	94%
Firms (n=36)		74%	22%	79%	100%
1991 PBGC	74%	69%	13%	77%	90%
Firms (n=33)		77%	10%	81%	111%
1992 PBGC	74%	72%	41%	78%	95%
Firms (n=36)		78%	40%	85%	105%
1993 PBGC	77%	74%	42%	77%	95%
Firms (n=34)		76%	37%	82%	97%
1994 PBGC	78%	78%	59%	81%	97%
Firms (n=33)		80%	43%	83%	105%
1995 PBGC	88%	82%	57%	86%	96%
Firms (n=34)		84%	33%	87%	109%

Panel A of Table 4 reports the results of the abnormal return calculations for each PBGC press release date. For each press release date, daily, two-day ($t=-1,0$), and three-day ($t=-1,0,1$) abnormal returns are reported for listed firms with available price data. As seen in the Table, none of the two-day abnormal returns around the press release dates are significantly different from zero. Even the signs of the abnormal returns - positive for three lists and negative for four lists - do not indicate that the market penalizes firms for being on the list. Rather, the abnormal returns suggest that the market does not react to the PBGC information on the date of release.

Additional abnormal return test specifications are investigated in order to examine aspects of the PBGC list setting that potentially affect market reaction. For example, one possible reason for the failure to find a market reaction is that some firms appear on multiple lists. The market may react most strongly the first time a

firm is included on, or is removed from, the list. To address this possibility, abnormal returns are calculated on two different subsets of firms. First, returns are calculated around the press release date that a firm is originally included on a list. Second, returns are calculated around the press release date that a firm is removed from the list. Like the full sample, the abnormal returns for both subsets, reported in Panel B of Table 4, are insignificantly different from zero.

Another possible reason for the failure to detect abnormal returns is that the information from the PBGC does not reach the market

until it is carried by another news source. Dhaliwal and Erickson (1998) document an instance where the market reacts to information only after its coverage in *The Wall Street Journal*. Investigating stock market reaction to a tax-related Supreme Court ruling, they find no reaction on the date of the decision. However, they do find a reaction two weeks later when the case is covered in the *Journal* and, presumably, becomes widely known. Similarly, the PBGC list information may not be widely known until reported in a news source such as *The Wall Street Journal*. Fortunately for test purposes, the *Journal* published the PBGC's November, 1992, press release on February 4, 1993. Thus, this study can conduct an investigation similar to Dhaliwal and Erickson (1998) to determine if there is a detectable market reaction at the time of widespread dissemination of the information.

Panel C of Table 4 reports the abnormal returns calculated around the date the *Journal* published the November, 1992, list. The num-

Table 4
Abnormal Returns

Panel A:

	5/7/90 (1988) n=37		2/25/91 (1989) n=31		11/25/91 (1990) n=31		11/19/92 (1991) n=28	
Day	<u>AR</u>	<u>CAR</u>	<u>AR</u>	<u>CAR</u>	<u>AR</u>	<u>CAR</u>	<u>AR</u>	<u>CAR</u>
-1	-0.0034		0.0179		-0.0084		-0.0047	
0	0.0117	0.0082	0.0044	0.0223	0.0033	-0.0051	-0.0068	-0.0115
+1	0.0079	0.0161	-0.0183	0.0040	0.0044	-0.0007	0.0071	-0.0044

	11/22/93 (1992) n=33		12/13/94 (1993) n=32		12/06/95 (1994) n=31			
Day	<u>AR</u>	<u>CAR</u>	<u>AR</u>	<u>CAR</u>	<u>AR</u>	<u>CAR</u>		
-1	-0.0033		0.0033		-0.0028			
0	-0.0103	-0.0136	0.0038	0.0071	-0.0030	-0.0058		
+1	0.0002	-0.0134	0.0128	0.0199	-0.0017	-0.0075		

Panel B:

	First time firm appears on PBGC list n=72		First time firm drops off PBGC list n=43	
Day	<u>AR</u>	<u>CAR</u>	<u>AR</u>	<u>CAR</u>
-1	-0.0001		0.0016	
0	0.0033	0.0032	-0.0048	-0.0032
+1	0.0016	0.0048	-0.0059	-0.0091

Panel C:

	Date list published in Wall Street Journal (2/4/93) n=21		PBGC press release date for Wall Street Journal firms (11/19/92) n=21	
Day	<u>AR</u>	<u>CAR</u>	<u>AR</u>	<u>CAR</u>
-1	0.0056		-0.0018	
0	0.0202***	0.0258**	-0.0086	-0.0103
+1	-0.0028	0.0229	0.0047	-0.0056

*(**)[***] significant at less than the 10%(5%)[1%] level.

AR = Daily abnormal return.

CAR = Cumulative abnormal return.

number of firms included in the calculation dropped from 28 to 21 due to the elimination of 7 firms that had earnings or dividend announcements in the *Journal* around the publication date.

As seen in the panel, the two-day abnormal return for the 21 firms is significantly positive. The significant return is isolated to the *Journal's* coverage date, as the two-day abnormal return around the PBGC's press release date for these same 21 firms, also reported in Panel C, is in-

significantly different from zero. Thus, like the setting in Dhaliwal and Erickson (1998), market reaction appears to be contingent on the widespread dissemination of the relevant information.

Why Did the Market React Positively?

The positive market reaction documented in Table 4 is inconsistent with a market penalty. Instead of penalizing firms, the market

appears to have rewarded those firms on the list. A potential explanation consistent with such a reaction is that the market valued the "pension put option" inherent in the underfunded pension plans of listed firms. This pension put option arises due to the manner in which the PBGC insurance program is administered. The program has a fixed-fee structure that charges a flat-rate premium for all plans and an additional variable-rate premium for underfunded plans. The variable-rate premium is capped, making the total premium for PBGC insurance fixed for the most underfunded plans.⁵

When a firm can no longer sustain its plan, the PBGC will administer the plan. The firm is liable to the PBGC in an amount equal to the lesser of 1) the excess of the plan's guaranteed benefits over the value of the plan assets or 2) 30% of the net worth of the firm (P.L. 93-406, Sec. 4062). When unfunded guaranteed benefits exceed 30% of net worth, the firm has purchased an implicit pension put option from the PBGC at a fixed insurance premium. As Bicksler and Chen (1985) demonstrate analytically, the value of the put decreases as pension assets increase, increases as vested pension benefits increase, and increases as the risk of pension assets increases.

Previous researchers argue that the pension put should be an important factor in corporate pension funding strategies (e.g., Sharpe, 1976; Bicksler and Chen, 1985). However, empirical tests have produced weak results at best. Bodie, Light, Morck and Taggart (1985) find that firms with lower bond ratings have lower pension funding levels. They state that such an association is consistent with the pension put option: firms with greater risk are maximizing the value of the pension put by reducing pension funding levels. Francis and Reiter (1987) cannot document an association between the pension put and funding levels. They too base their proxy of the pension put on the risk of the firm.

Unlike Bodie et al. (1985) and Francis

and Reiter (1987), who assume that the pension put has value and then investigate whether the put affects funding levels, this study can utilize the market returns around the *Journal's* publication to obtain direct evidence on whether the pension put option itself has value or not. Firm-specific abnormal returns are regressed onto three proxies for the pension put. First, as Bicksler and Chen (1985) note, the value of the pension put increases as pension assets (liabilities) decrease (increase). Therefore, the put value should increase as funding ratios decrease, leading to the hypothesis that funding ratios are negatively associated with abnormal returns. Second, as Babcock (1985) observes, there may not be many firms in a condition where the put is valuable. Two variables attempt to capture whether a firm is in a condition for the put to have value. First, firms with pension obligations in excess of 30% of net worth are "in the money" in that transferring the plan to the PBGC would cost less than funding the plan. This leads to the hypothesis that firms "in the money" should have higher abnormal returns. Second, firms with persistent underfunding are more likely eventually to utilize the put option. As a result, firms appearing on all previous PBGC lists should have a higher put value, leading to the hypothesis that persistent underfunding is positively associated with abnormal returns.

The three hypotheses above are tested using the following regression:

$$AR_i = \alpha_i + \beta_1 FR_i + \beta_2 MONEY_i + \beta_3 FREQ_i + \beta_4 INDUSTRY_i + \varepsilon_i$$

where AR is the abnormal return on the date the *Journal* published the November, 1992, list; FR is the firm's funding ratio reported on the PBGC list; MONEY is a dummy variable taking the value of one if a firm's unfunded pension obligation exceeds 30% of net worth⁶; FREQ is a dummy variable taking the value of one if the firm is included on all four PBGC lists published through November, 1992, and zero otherwise; and INDUSTRY is a dummy control variable

taking the value of one if the firm has an SIC code in the 3000's and zero otherwise.⁷

Results of the regression estimation are reported in Table 5. The coefficient on MONEY is positive and statistically significant at the $p=.045$ level (one-sided), suggesting that firms that were "in the money" had more positive abnormal returns than those firms that were not "in the money." This result is consistent with the pension put having value to the market. The positive coefficient on FREQ, although insignificant, is consistent with the prediction that the magnitude of abnormal return was higher for those firms with persistent underfunding. The negative coefficient on INDUSTRY suggests that firms with SIC codes in the 3000-3999 range had smaller positive abnormal returns than other sample firms. This result helps to rule out the potential argument that the positive sample abnormal return on the *Journal* date was a result of significant events occurring in the 3000 SIC code industries on that day. The coefficient on FR is positive, which is opposite the prediction.

Conclusions

With the goal of increasing pension plan

funding, the PBGC released the top fifty underfunded firms list for eight years. This study provides information on capital market participants' perceptions of the list. There is no statistically significant abnormal return on the annual PBGC press release dates; however, a statistically positive abnormal return on the date the 1992 list is published in *The Wall Street Journal* suggests that information needs to be widely disseminated in order to detect a reaction. The positive market reaction also suggests that instead of penalizing firms for being on the list, market participants valued the pension put option. Additional tests show that abnormal returns are higher for firms that are "in the money" and that appear frequently on the PBGC lists. The results of these additional tests are consistent with the pension put having value to the market.

Overall, the study's results indicate that shareholders were unlikely to exert pressure on firm managers to increase funding. In other words, it appears that PBGC goals with respect to the Top 50 lists were not reinforced by shareholders. Thus, the PBGC was apparently wise to discontinue the publication of the list and direct scarce agency resources to more effective means of increasing pension funding.

Suggestions for Future Research

This study suggests several avenues for future research. One of the more interesting findings was the existence of an abnormal return only on the date that the PBGC information was published in *The Wall Street Journal*. Other research documents similar cases where abnormal returns occur only when information is reported in the financial press. The notion of information dissemination to the capital markets, and specifi-

Table 5
Results of Multiple Regression

$$AR_i = \alpha_i + \beta_1 FR_i + \beta_2 MONEY_i + \beta_3 FREQ_i + \beta_4 INDUSTRY_i + \varepsilon_i$$

$R^2 = .19$ and $N = 21$

Variable (predicted sign)	Coefficient	Std Error	T-statistic	P-value
Intercept	-0.0141	0.0339	-0.42	.68
FR (-)	0.0005	0.0004	1.12	.14
MONEY (+)	0.0289	0.0160	1.81	.05
FREQ (+)	0.0098	0.0081	1.21	.12
INDUSTRY (?)	-0.0148	0.0074	-2.00	.06

AR = Abnormal return on date PBGC list published in *The Wall Street Journal* (2/4/93). FR = Funding ratio as reported by the PBGC. MONEY = Dummy variable taking the value of one if a firm's unfunded pension obligation is greater than 30% of net worth; zero otherwise. FREQ = Dummy variable taking the value of one if a firm was included on all prior PBGC lists; zero otherwise. INDUSTRY = Dummy variable taking the value of one if a firm has an SIC code from 3000 to 3999; zero otherwise.

cally which outlets are followed heaviest by the markets, is an area that is interesting and warrants further investigation.

With respect to pension research, further investigation is needed to better evaluate the pension put. For example, how does the market consider the put when assessing total firm value? Do other firm characteristics such as free cash flow and investment opportunities affect the valuation of the put? Also, further investigation is needed into how the put affects pension accounting choices such as funding levels. Do firms that are "in the money" decrease funding to increase the value of the put?

With respect to the PBGC, an in-depth analysis of how the PBGC regulates pension funding, including how it decides to discontinue a program such as the list, would be an interesting addition to pension and regulation research.

Footnotes

1. For example, the 1992 list (press release date November 19, 1992) was published in the November 23, 1992 issue of *Pensions and Investments* and in the February 4, 1993 issue of *The Wall Street Journal*. The 1991 list (press release date February 25, 1991) was published in the March 18, 1991 issue of *National Underwriter*.
2. Dhaliwal and Erickson (1998) document the same phenomenon when investigating tax-related Supreme Court rulings.
3. The yearly firm data reported in Tables 2 and 3 include data for a subset of the 50 listed firms. Because the list includes privately held companies and wholly-owned subsidiaries, the firm data is limited to those publicly traded firms with available pension data.
4. To ensure that other firm specific events did not result in abnormal market performance that could be attributed incorrectly to the PBGC information or could mask the PBGC information's true effect,

The Wall Street Journal was searched around the press release dates to identify the announcement of earnings, dividends, mergers, etc. concerning sample firms. Firms with such contaminating events were eliminated from the abnormal returns calculations.

5. The Retirement Protection Act of 1994 (RPA) changes the insurance premium structure. For plan years beginning after June 30, 1994, the RPA phases out and eventually does away with the cap on the variable rate premium, thus increasing the cost of the put option (PBGC Technical Update 95-1, Part 2, VII).
6. Total assets, total assets less total liabilities, and market value of equity were used as proxies for net worth. For each measure, pension obligations exceeded 30% of net worth for the same 3 firms.
7. As 12 of the 21 firms have SIC codes in the 3000's, INDUSTRY is included to determine if the significant abnormal return for the sample was driven by those in the industries ranging in SIC codes from 3000 to 3999.

References

1. Babcock, Guilford C., "Discussion of 'The Integration of Insurance and Taxes in Corporate Pension Strategy,'" *Journal of Finance*, Vol. 40, No. 3, pp. 955-957, 1985.
2. Bodie, Zvi, Jay O. Light, Randall Morck and Robert A. Taggart, "Corporate Pension Policy: An Empirical Investigation," *Financial Analysts Journal*, Vol. 41, No. 5, pp. 10-16, 1985.
3. Blankley, A.I. and R.Y. Tang, "Measuring Pension Liabilities: An Examination of the Funding Levels of Defined Benefit Pension Plans," *Journal of Applied Business Research*, Vol. 11, No. 2, pp. 73-83, 1995.
4. Bicksler, James L. and Andrew H. Chen, "The Integration of Insurance and Taxes in Corporate Pension Strategy," *Journal of Finance*, Vol. 40, No. 3, pp. 943-955,

- 1985.
5. Brostoff, Steven, "Benefit Pros Call PBGC Underfunded List 'Gimmick,'" *National Underwriter*, Vol. 101, No. 1, p. 9, January 6, 1997.
6. Burr, Barry B., "PBGC Lists Worst-Funded Plans," *Pensions and Investments*, Vol. 20, No. 25, pp. 2,37, November 23, 1992.
7. Dhaliwal, Dan S. and Merle M. Erickson, "Wealth Effects of Tax-Related Court Rulings," *Journal of the American Taxation Association*, Vol. 20, No. 1, pp. 21-48, 1998.
8. Financial Accounting Standards Board (FASB), *Statement on Financial Accounting Standards No. 87: Employers' Accounting for Pensions*, FASB, Stamford, Connecticut, 1986.
9. Fisher, Mary Jane, "PBGC's Underfunded List Criticized," *National Underwriter*, Vol. 95, No. 11, pp. 21,29, March 18, 1991.
10. Francis, Jere R. and Sara Ann Reiter, "Determinants of Corporate Pension Funding Strategies," *Journal of Accounting and Economics*, Vol. 9, No. 1, pp. 35-59, 1987.
11. Pension Benefit Guaranty Corporation, News Release, November 25, 1991.
12. Pension Benefit Guaranty Corporation, News Release, November 19, 1992.
13. Pension Benefit Guaranty Corporation, Technical Update 95-1, Part 2, VII, February 3, 1995.
14. Pension Benefit Guaranty Corporation, News Release, December 12, 1996.
15. Pension Benefit Guaranty Corporation, News Release, September 3, 1997.
16. Sharpe, William F., "Corporate Pension Funding Policy," *Journal of Financial Economics*, Vol. 3, No. 3, pp. 183-193, 1976.
17. "Some on Pension List Call U.S. Data Too Pessimistic but Concede Problems," *The Wall Street Journal*, Vol. 221, No. 24, p. A12, February 4, 1993.
18. United States Congress, *Employment Retirement Income Security Act of 1974*, Public Law 93-406, Congressional Printing Office, Washington, D.C., 1974.
19. United States Congress, *Retirement Protection Act of 1994*, part of *General Agreement on Tariffs and Trade Legislation*, Public Law 103-465, Congressional Printing Office, Washington, D.C., 1994.
20. Vise, David A., "Going After the Pension Gaps: PBGC Pressures Companies With It's List of Underfunded Plans," *The Washington Post*, Vol. 116, No. 353, pp. C1, 11, November 23, 1993.

Notes

Notes