



AMERICAN ACADEMY *of* ACTUARIES

May 4, 2000

Mr. David Strauss
Executive Director
Pension Benefit Guaranty Corp.
1200 K St. NW
Washington, DC

Dear Mr. Strauss:

The American Academy of Actuaries (Academy) and Conference of Consulting Actuaries (Conference) are pleased to provide you with a copy of our study of PBGC Plan Termination Cost. The purpose of the Academy-Conference study was to compare, for a sample of transactions, actual costs to terminate a plan with those that would have resulted had PBGC assumptions been used. The study also identifies potential areas for future research regarding the use and derivation of these assumptions. The analysis underlying the study was conducted by an independent consulting firm, Oliver Consulting.

Some of the study's key findings include:

- **The data do not show a large difference between PBGC estimates and actual annuity settlements for the plans studied.** The annuity results show a relatively small overstatement of termination liability (averaging 3% to 4%). The difference was apparently primarily due to mild interest rate conservatism. Further study, particularly of deferred versus immediate annuity settlement amounts, would shed more light in this area.
- **Large annuity purchases were underrepresented.** Available data did not cover very large plan terminations, with the mean cost for annuity purchases being less than \$5 million. Since large annuity purchases were underrepresented in the study, no conclusions should be drawn regarding the application of the results to such purchases.
- **Annuity results should be looked at separately from lump sum results.** Lump sums were based on plan provisions, so it is not surprising that they did not mimic the potential cost of annuity purchases. As such, the lump sums varied depending on whether the plan included early retirement subsidies in the cashout value. Where optional lump sums were offered, incidence of electing that option was high.

- **There was insufficient data to compare PBGC expected retirement age methodology** to the assumptions used by insurance companies in annuity purchases, or to the actual rates of retirement for ongoing plans. The PBGC is encouraged to use their data for trustee plans to improve on their outdated XRA methodology.

Although our study only included a sample of plans, we believe the data are sufficient to draw meaningful conclusions and will be helpful to your agency as it explores ways to improve the calculation of plan termination liabilities. The Academy would be pleased to work with you and your staff in this endeavor.

Sincerely,

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Vice President, Pensions
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Cc: David Gustafson, Jane Pacelli

**American Academy of Actuaries-Conference of Consulting Actuaries
PBGC Plan Termination Cost Study**

May 4, 2000

Prepared by Oliver Consulting

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Summary of Findings

1.1 Background

For some time Pension Benefit Guaranty Corporation (PBGC) actuarial assumptions have been used as a basis for a variety of calculations including: valuations of PBGC trustee pension plans, preliminary estimates for standard plan terminations, and calculations in IRC 414(l) spinoff situations. This study was designed as a pilot study to pinpoint potential areas for future research regarding the use and derivation of these assumptions. The technique used was to analyze differences between the actual costs of non-trustee pension plan terminations and those predicted using Pension Benefit Guaranty Corporation (PBGC) actuarial assumptions for annuities.

Data for the study was solicited from the actuarial community. Responses, along with comprehensive individual participant data, were received from 5 companies for a total of 38 plans. Most of the data received related to plan terminations that occurred between 1994 and 1997 and thus fell under the current PBGC assumption structure. Thirty-five of the cases involved annuity purchases. It is estimated that around 75% of the total premiums applied to immediate annuities. The purchases would generally be considered medium to small in terms of total premium as illustrated below.

Distribution of Cases by Total Premium

Minimum:	\$19,257
Maximum:	\$30,300,000
Mean:	\$4,930,352
Quartiles:	
1 st	\$370,067
2 nd	\$2,877,372
3 rd	\$5,700,000

The study focuses on annuitized participants. However, data regarding cashouts was supplied in some (sixteen) cases and where provided was included in the study.

1.2 Annuity Settlements

For the 35 cases involving annuity purchases, termination costs on a PBGC basis exceeded actual settlement costs by 3% on average, with a standard deviation of 7%. When two outliers were eliminated, the mean excess increased to 4%, with a standard deviation of 5%.

For these cases, PBGC costs exceeded settlement costs for 74% of these cases. For about ½ of the cases this excess was under 5%. For about ⅓ of the cases it was between 5% and 10%.

Insurer's pricing assumptions were supplied for seven plans terminating in late 1995 and 1996. In all but one case the insurer's interest rate exceeded both the PBGC's i_1 interest rate and the 30-year Treasury rate. For these seven cases the insurer's interest rate exceeded the PBGC i_1 rate by 71 basis points on average and the 30-year Treasury rate by 21 basis points on average.

For four of these cases, which primarily involved immediate annuities, individual data was supplied. Estimated PBGC termination costs for these cases exceeded annuity purchase costs by an average of 7%. This was mostly due to the insurers' higher interest rate assumptions, which were on average 81 basis points above the PBGC i_1 rate.

1.3 Cashout Settlements

For the 16 cases for which comprehensive cashout settlement data was provided, results were grouped by cashout methodology as follows:

- (1) Minimum GATT¹: 30-Year Treasury rate, 1983 Group Annuity Mortality Table on unisex basis, retirement at plan's Normal Retirement Age
- (2) Minimum GATT with Early Retirement: 30-Year Treasury rate, 1983 Group Annuity Mortality Table on unisex basis, early retirement for those eligible
- (3) Old PBGC Lump Sum: "Old" PBGC Interest Rates, UP-1984 Mortality, early retirement for those eligible

¹ This refers to the GATT Act (Uruguay Round Agreements Act, implementing the Uruguay Round of the General Agreement on Tariffs and Trade), which included provisions regarding the calculation of cashouts on this basis.

For comparability purposes, these results were further adjusted to reflect (1) cashout amounts based on interest rates one month prior to the cashout date for plans using an interest rate tied to an earlier date and (2) PBGC plan termination costs based on unisex mortality. On this basis, PBGC termination costs exceeded cashout amounts by 17%, 21%, and (9%), respectively, for the three different types of cashouts and the average excess of PBGC termination costs over cashout amounts was 9%.

An analysis of the cashout results indicated that the primary factor influencing differences between PBGC estimates and cashout amounts under the different cashout methodologies was the interest rate. Use of the PBGC XRA assumption accounted for about $\frac{1}{3}$ of the 9% excess.

1.4 Total Settlements

Results for the 17 cases where both annuity purchase and cashout data were supplied were highly influenced by cashout basis. The average adjusted excess of PBGC termination costs over settlement costs was 9%. For these 17 cases average termination costs on a PBGC basis exceeded total settlement costs by 13%, 17%, and (4%) respectively for the three groups outlined above using adjustments (1) and (2) in the previous paragraph. The average cashout election percent was 94% for actives and vested terminations and 37% on average for the two cases in which retirees were allowed to cash out.

1.5 Conclusions

Data used in this study was provided by five cooperating firms. Thus, it is not clear as to how representative the results are of plan terminations in general. Certainly due to both the manner in which the sample was gathered and the sample size, the results cannot be considered statistically significant. In particular, no large plan terminations were included in the study. Potential areas for future study are highlighted below.

- **Further Study Of Interest and Mortality Rate Structure**

The data do not show a large difference between PBGC estimates and actual annuity settlements. However, in all but 6 cases out of 35, PBGC estimates exceeded annuity costs. The small amount of data available regarding insurer pricing assumptions suggests that this difference may lie in the interest rate assumptions. Further study – particularly of deferred versus immediate annuity settlement amounts – would be helpful to shed more light in this area.

- Review Of Retirement Age Methodology used in PBGC Annuity Calculations

An individual's choice of early retirement age may be based on a variety of factors including economic considerations (i.e. total retirement income relative to current income), availability of part-time employment, disablement, job satisfaction, and joint planning for married couples.

Depending on the circumstances surrounding the plan termination, the PBGC methodology calculates the assumed retirement age (XRA) as either:

- the earliest possible retirement age, or
- an age between the earliest possible retirement age and the earliest age for unreduced retirement benefits – where (for active employees, if termination of employment is required for benefit receipt) the calculation of this age is based on the magnitude of the unreduced benefit, adjusted for the years until it is payable.

Outliers in the study point out areas of deficiency in this method – namely the absence of consideration of the plan's early retirement factors including: (1) the impact of alternate early retirement schedules, and (2) differences in the level of subsidization at various retirement ages. Other items also seem to be relevant. For instance, other sources of retirement income are not directly taken into account – particularly potential income from Social Security at age 62 and income from other retirement plans.

In most medium and large retirement plan valuations, these factors are taken into account by the use of retirement rates based, at least in part, on the plan's experience. The considerations involved in setting retirement ages for terminated plans – particularly the additional incentive to commence payment at the first age for unreduced benefits due to the frozen benefit accruals, and potential differences in experience for plan terminations of financially troubled vs. ongoing employers – argues for a separate review of the data applicable to this group. Data available for plans the PBGC has trustee would be one such source of data, keeping in mind that it generally applies to financially troubled employers. This data could be reviewed and contrasted with the results of other studies – for instance the retirement rate studies conducted by the Society of Actuaries. Another approach would be to attempt to provide some quantification of the factors underlying retirement decisions for employees nearing retirement – including the impact of early retirement reduction factors – using focus groups or statistical sampling techniques.

Study Description and Methodology

2.1 Purpose

This study was designed as a pilot study to pinpoint potential areas for future research regarding the use and derivation of PBGC assumptions. The technique used was to analyze differences between the actual costs of non-trusted pension plan terminations and those predicted using Pension Benefit Guaranty Corporation (PBGC) actuarial assumptions for annuities.

Data for the study was solicited from the actuarial community for plan terminations. Responses with comprehensive individual participant data were received from 5 companies for a total of 38 plans. Most of the data received related to plan terminations that occurred between 1994 and 1997 and thus fell under the current PBGC assumption structures.

2.2 Data

Data requested included individual participant data and plan provisions supplied to insurers for annuity quotes and individual participant data for cashouts. Data supplied included individual participant data for 38 plans. Thirty-five of these plans purchased annuities for at least some of their participants and most provided a cashout election to deferred annuitants. Individual cashout data was provided for 16 cases. With this additional information, complete plan termination data was available for 17 cases. The data was not audited. A summary of the data provided appears in Table 1. Relevant plan provisions are summarized in Appendix B.

Table 1: Summary of Data Provided for 38 Plans Included in the Study

		Number of Participants			Total Settlement Amount	Average Settlement Amount
		Employees and Vested Terminations	Retired	Total		
Data For:	Plans					
Annuity Settlements	35	2,923	4,003	6,926	\$172,562,323	\$24,915
Cashout Settlements	16	7,754	27	7,781	\$44,504,451	\$5,720
Total Plan Settlements	17	8,972	855	9,827	\$72,412,492	\$7,369

2.3 Methodology and Assumptions

For each plan, PBGC plan termination costs were determined as of each plan's settlement date using then-current PBGC annuity assumptions for trustee single-employer plans. For plans terminating on or after November 1, 1993 (the majority of plan's included in the study), these assumptions included:

- PBGC select and ultimate interest rates (i_1 and i_2)
- The 1983 Group Annuity Mortality Table
- Retirement at a single assumed retirement age (XRA), based on earliest possible retirement age, earliest age for unreduced benefits, whether termination of employment was required for benefit commencement, and, in certain cases, monthly benefit amount and year of eligibility for unreduced benefits
- The PBGC administrative load based on \$200 per participant plus a percentage of the plan termination liability based on the liability's size and the i_1 interest rate.

Providing the employment relationship was not severed at plan termination, employees at the plan termination date were assumed to continue to earn service for early retirement eligibility purposes and not to terminate employment until retirement.

A more detailed description of the assumptions is provided in Appendix A.

Comparison of Annuity Purchase Settlements with PBGC Valuation Results

3.1 Data

Individual data was supplied for a total of 35 plans. Cashouts were offered in most of the cases causing the data to be weighted towards immediate annuities. An estimated 75% of the total settlement amount was devoted to purchases of immediate annuities. The remaining 25% represented deferred annuity purchases. The data is summarized in Table 2 below by number of participants per plan.

Table 2: Distribution of Number of Annuitants by Plan

Number of Participants Receiving Annuities	Number of Plans
1 - 24	11
25 - 99	8
100 - 999	15
<u>>= 1,000</u>	<u>1</u>
Total	35

3.2 Calculation Results

For each retirement plan PBGC plan termination costs were calculated as of the annuity purchase date using the participant data supplied to insurers. These valuation results were then compared to the amount of the actual cost of annuities.

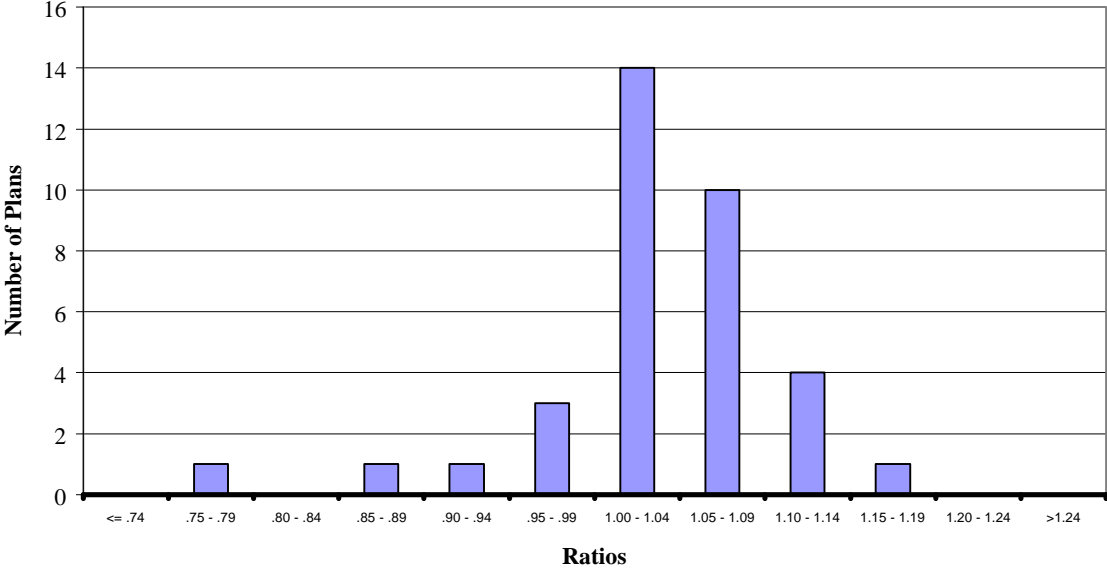
To facilitate the comparison, the ratio of:

- (1) The estimated PBGC plan termination costs for annuitized participants, to
- (2) The actual cost of annuities

was calculated. This type of ratio is referred to as a PBGC Plan Termination Ratio for the remainder of this report. A PBGC Plan Termination Ratio greater than 1.0 indicates that estimated PBGC plan termination costs were higher than the actual settlement amount.

Figure 1 below shows the distribution of the PBGC Plan Termination Ratios for the 35 annuity purchases in the study. The mean of the distribution is 1.03 and the standard deviation is .07. If the two outliers less than .90 are eliminated, the mean becomes 1.04 and the standard deviation is .05.

Figure 1 - Ratios of PBGC Costs to Plan Termination Costs For Annuity Settlements



3.3 Analysis

3.3.1 Insurer’s Pricing Assumptions

Certain insurer pricing assumptions (generally interest rate, mortality table, and expense loads) were supplied for seven cases. These assumptions were analyzed and it appeared that among them the primary factor causing PBGC plan termination ratios to exceed 1.0 was higher insurer interest rate assumptions. In six of the seven cases, insurer interest rates exceeded the PBGC i_1 interest rate. For all seven cases, on average, the insurer interest rates exceeded the PBGC i_1 rate by 71 basis points.

PBGC plan termination ratios for the four cases for which individual data was available are broken down below. For these cases the insurer interest rates exceeded the PBGC i_1 rate by 81 basis points on average and, ignoring expenses, the average of the estimated percentage of premium devoted to immediate annuities was 77%. We were able to reconcile closely to the purchase prices using the assumptions provided by the insurers. Thus, the net effect of other factors for which we were not provided insurer assumptions, including the PBGC retirement age assumptions versus those of the insurer, did not appear to be significant. However, these plans were fairly simple. They included no lump sums or unusual ancillary benefits and, where deferred annuities were material, the early retirement provisions were fairly standard – normal retirement at age 65, retirement as early as age 55, 6.67% / 3.33% per year early retirement reductions from age 65.

Table 3: Analysis of PBGC Ratio for Four (4) Plan’s Providing Pricing Assumptions

	PBGC Plan Termination Ratio
Average	1.07
Portion Over 1.0 Due to:	
Lower PBGC Interest Rates	0.08
Higher PBGC Mortality Rates	-0.02
Higher PBGC Administrative Expense	<u>0.01</u>
	0.07

Figure 2 below compares PBGC interest rates to insurer interest rates by date of annuity purchase for the seven cases. In all cases but one, the insurer interest rates exceed the PBGC interest rates. Similarly, in all but one case, the insurer interest rates exceed the 30-year Treasury rates, on average by 21 basis points. Figure 3 on the next page illustrates results if PBGC rates are moved back two months.

Figure 2: Insurer Interest Rates vs. PBGC Interest Rates and 30-year Treasury Rates

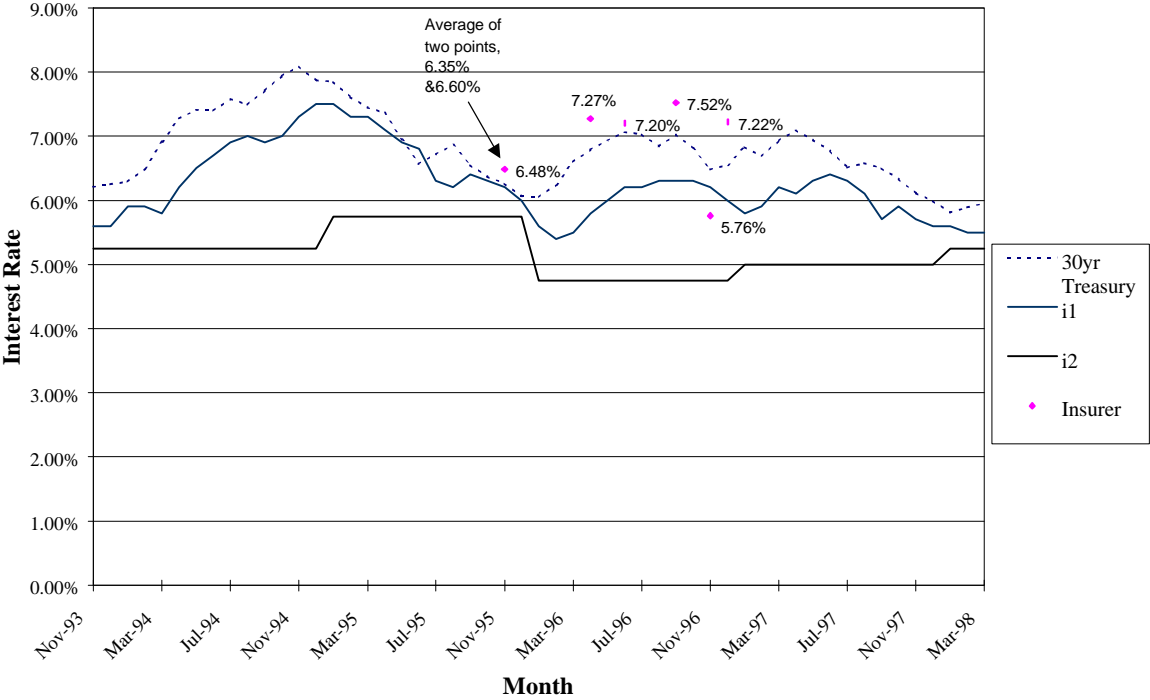
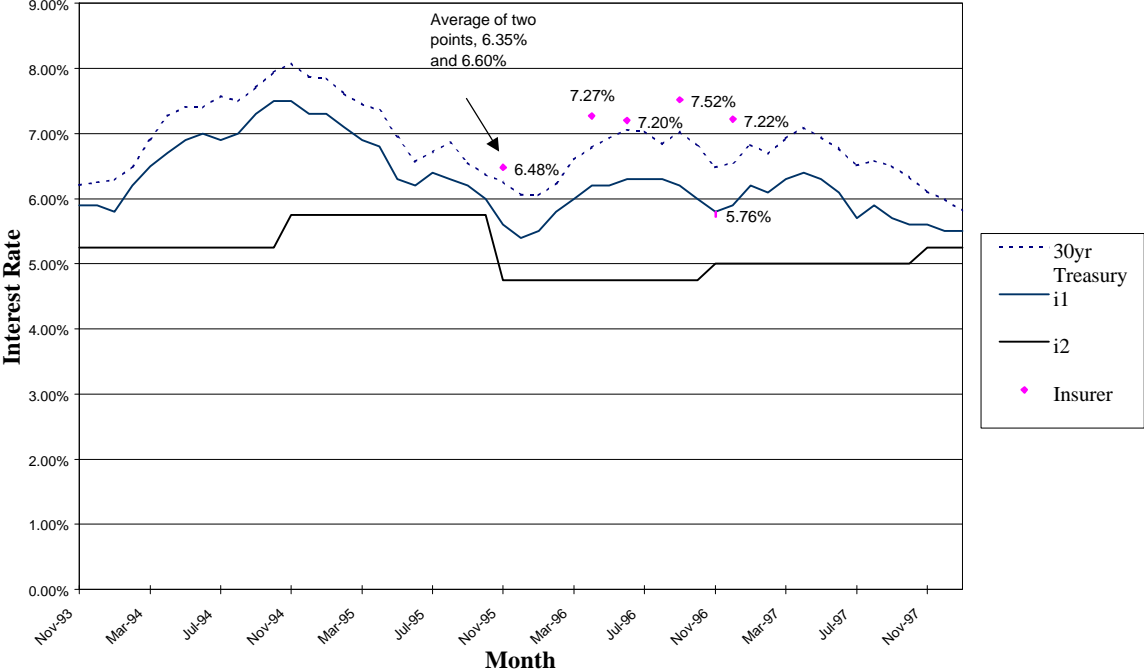


Figure 3: Insurer Interest Rates vs. PBGC Rates 2 Months Later and 30-year Treasury Rates



PBGC interest rates are derived as a balancing item based on a survey of group annuity purchase rates conducted by the ACLI. Specifically, they are calculated as the interest rate which, when combined with the PBGC mortality, will produce the average of the annuity purchase rates included in the survey.

3.3.2 Impact of Plan Provisions

The two outliers with PBGC ratios under .90 were separately analyzed to determine factors that may have decreased PBGC plan termination costs relative to actual annuity costs.

In the first case, (with a .78 ratio), over 90% of the liabilities were made up of deferred annuities for active and vested terminated participants and several factors affected the results.

- Stiffly reduced early retirement benefits were available at any age without termination of employment. In addition, actives were entitled to receive a heavily subsidized early retirement benefit at age 55 with 10 years of service without terminating employment. For this type of plan, the PBGC retirement age methodology ignores the possibility of a subsidized benefit at age 55 and picks a retirement age between the date first eligible for retirement benefits (the current age) and the date unreduced benefits are first payable (generally age 62 in this case). In addition, because termination of employment is not required for benefit commencement; it picks an age closer to the current age². When the methodology was applied, only 8% of the eligible actives were assumed to take the subsidized benefit.
- Lump sums on a GATT basis were available at any age without termination of employment. For those electing lump sums prior to qualifying for the subsidized early retirement benefit, these lump sums were calculated as the present value of the age 65 benefit, thus avoiding the stiff early retirement penalties. If actives deferred the lump sum until they were eligible for the subsidized early retirement benefit, its value was included in the calculation. In addition, for certain vested terminations, a minimum was placed on the lump sum, which substantially increased its value over the GATT basis.

In the second case (with a .89 ratio and 56% of the PBGC liability due to active and vested terminated participants), early retirement and lump sums were again available at any age and, for lump sums, without termination of employment. In addition a subsidized early retirement reduction schedule applied after age 55. However, a larger proportion of participants were retired, and thus, not eligible for the cashout election. Also, the impact of the PBGC retirement age methodology was less because the before and after 55 early retirement reduction schedules were closer.

² Due to the relatively low unreduced retirement benefits provided under this plan the methodology applicable if termination were required would produce a higher retirement age assumption.

Summaries of early and normal retirement provisions for plans in the study are provided in Appendix B.

3.3.3 Impact of Case Size

PBGC plan termination cost ratios were calculated by case size. The results are summarized in Table 4 below. The ratios appear to increase somewhat by total annuity purchase price, but a larger sample and an analysis of other factors – such as the percentage of premium devoted to immediate versus deferred annuities – would be necessary to reach any conclusions. For the cases shown below, the percentage of premium devoted to immediate annuities was higher (87%) for the \$10,000,000 plus premium group than for the remainder of the group (72%). For these results the two outliers discussed above, which fell in the lower purchase price categories, have been removed.

Table 4: Distribution of PBGC Plan Termination Ratios by Annuity Purchase Price³

Total Annuity Purchase Price	Average Price per Participant			
	Under \$25,000	\$25,000 to \$49,999	\$50,000 or More	Total
Less than \$1,000,000	1.04	1.05	1.10	1.05
\$1,000,000 - \$4,999,999	1.03	1.03	1.01	1.02
\$5,000,000 - \$9,999,999	1.06	.97	1.06	1.05
\$10,000,000 or More	1.00	1.14	1.08	1.07
Total	1.04	1.04	1.05	1.04

3.4 Conclusions

- For the group of annuity purchases reviewed, PBGC plan termination costs are close to, but consistently somewhat higher than, annuity settlement costs. In some cases these differences can be explained by differences in assumed interest rates.
- The PBGC XRA methodology is not well suited to cases where multiple early retirement schedules are involved.

³ Numbers of plans associated with this chart are: Row 1: 8, 3, 1, 12 Row 2: 4, 3, 3, 10 Row 3: 5, 1, 2, 8 Row 4: 1, 1, 1,3 Row 5: 18, 8, 7, 33.

Comparison of Cashout Settlements with PBGC Valuation Results

4.1 Data

Individual data was supplied for a total of 16 plans. It is summarized below in Table 5 by number of participants per plan.

Table 5: Distribution of Number of Participants Receiving Lump Sums by Plan

Number of Plan Participants	
Receiving Lump Sums	Number of Plans
1 - 24	4
25 - 99	4
100 - 999	7
$\geq 1,000$	1
Total	16

4.2 Calculation Results

For each retirement plan for which cashout data was supplied, PBGC plan termination costs were calculated as of the cashout date. For this calculation, PBGC plan termination costs were calculated based on PBGC annuity assumptions for all cashouts, including those under \$5,000⁴. These valuation results were then compared to the actual cashout amounts.

To facilitate the comparison, the ratio of:

- (1) the PBGC plan termination costs for cashed out participants and
- (2) the actual cashout amounts

was calculated. As in the previous section, this ratio is referred to as the “PBGC Plan Termination Ratio.” A “PBGC Plan Termination Ratio” greater than 1.0 indicates that estimated PBGC plan termination costs were higher than the sum of the lump sum cashouts paid upon plan termination.

⁴ Had PBGC cashout assumptions been used instead of PBGC annuity assumptions for cashouts under \$5,000, PBGC plan termination costs for the 16 plans under consideration would have increased by an average of approximately 5%.

Plan termination ratios averaged 1.10, but varied substantially from plan to plan. Different cashout methodologies explained much of the variation. In order to take into account these differences, the cashout results were split into three categories:

(1) GATT Lump Sum Basis

- 30-Year Treasury Rate
- 1983 Group Annuity Mortality Table on unisex basis
- Retirement at Plan's Normal Retirement Age

(2) GATT Lump Sum Basis with Recognition of Early Retirement (ER)

- 30-Year Treasury Rate
- 1983 Group Annuity Mortality Table on unisex basis
- Retirement, for those currently eligible, at either PBGC assumed retirement age (XRA) or earliest possible retirement age

(3) PBGC Lump Sum Basis with Recognition of Early Retirement (ER)

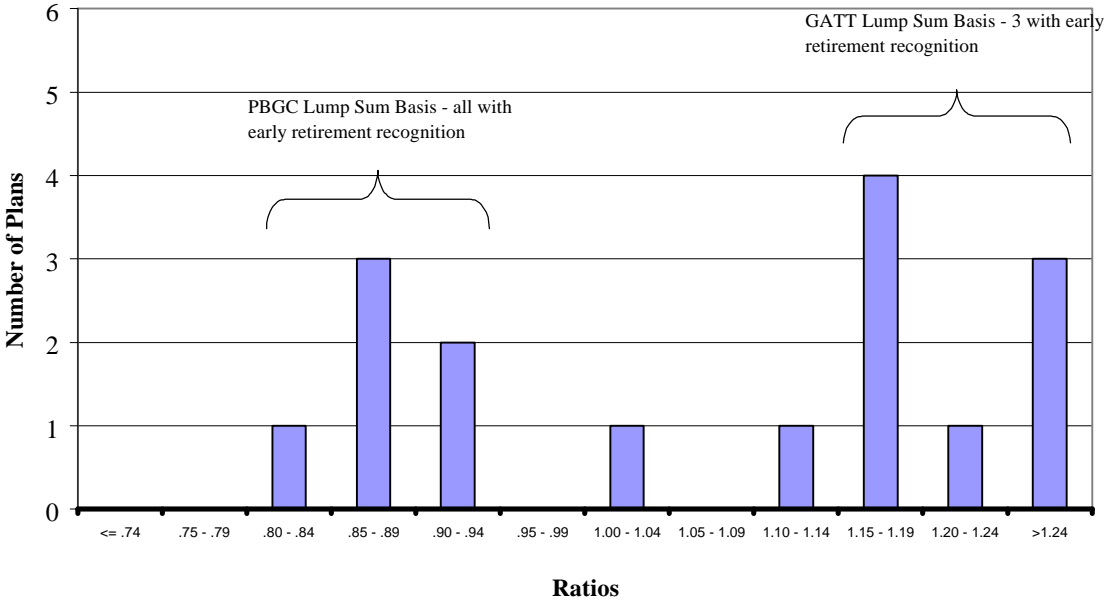
- "Old" PBGC Interest Rates
- UP-1984 Mortality Table
- Retirement, for those currently eligible, at either PBGC assumed retirement age (XRA) or earliest possible retirement age.

Table 6 on the next page shows average PBGC Plan Termination Ratios by cashout basis. Figure 4 on the next page shows the distribution of PBGC Plan Termination Ratios for these cases. As would be expected, the ratios for the two GATT bases are greater than 1 due to the use of 30-year Treasury rates, while the ratio for the PBGC lump sum basis is less than one, due to the use of the "Old PBGC assumptions.

Table 6: PBGC Plan Termination Ratios by Cashout Basis

Cashout Basis	Plans	Average PBGC Plan Termination Ratio
1) GATT Lump Sum	4	1.38
2) GATT Lump Sum with Recognition of Early Retirement	6	1.14
3) PBGC Lump Sum with Recognition of Early Retirement	<u>6</u>	<u>.88</u>
Total	16	1.10

Figure 4 - Ratios of PBGC Costs to Plan Termination Costs For Cashout Settlements



4.3 Analysis

4.3.1 Plan Termination Costs

In order to analyze the impact of the PBGC assumptions, the portion of the difference between PBGC valuation results and actual cashout amounts was broken down by assumption:

PBGC XRA –Difference between the use of the PBGC retirement age assumption (XRA) and the cashout basis retirement age assumption⁵

Sex-distinct Mortality – Difference between PBGC mortality on a sex-distinct basis and PBGC mortality using a unisex blend of 50/50.

PBGC Mortality – Difference between the PBGC mortality basis on a 50/50 unisex basis and the cashout basis mortality⁶.

PBGC Interest Rates – Difference between PBGC interest rates (i_1 / i_2 basis) and 30-year Treasuries, for GATT basis, and “old” PBGC interest rates, for PBGC Lump sum basis.

Lag in Cashout Interest Rate – Difference due to use of an interest rate prior to the month preceding cashout. Due to declining interest rates, the lag produced gains during the study period.

PBGC Administrative Expenses – Difference between PBGC administrative expenses and actual expenses charged to trust. This difference has been set to zero since no estimate of administrative expenses for cashouts was available.

Table 7 shows the impact of each assumption on the PBGC Ratios by cashout basis. It also shows the PBGC Ratios if differences due to sex-distinct versus unisex mortality and the

⁵ The cashout retirement age assumptions are: normal retirement age for Basis (1) and for those not eligible for early retirement under Bases (2) and (3); either attained age or PBGC XRA for those eligible for early retirement under Bases (2) and (3).

⁶ The difference for cases where the UP-1984 table applies also reflects the difference between the 50/50 unisex basis and the unisex basis that underlies that table (80/20).

timing of interest rates are eliminated. On this basis, the average PBGC Plan Termination Ratio for the total group is 1.09.

Table 7: Analysis of PBGC Annuity Assumption vs. Cashout Results by Assumption

	GATT Lump Sum	GATT Lump Sum w/ER	PBGC w/ER
PBGC Ratio	1.38	1.14	.88
Difference due to:			
1) PBGC XRA	.02	.03	.02
2) Sex-distinct Mortality	.02	-.07	-.03
3) PBGC Mortality	.00	.00	.12
4) PBGC Interest Rates	.17	.18	-.23
5) Lag in Cashout Interest Rate	.17	.00	.00
6) Administrative Expenses	<u>.00</u>	<u>.00</u>	<u>.00</u>
Total	.38	.14	-.12
PBGC Ratio recalculated without 2) and 5) ⁷	1.17	1.21	.91

The average male/female distribution for the cases included in the cashout group is 69%/31%. However the proportions for the various subgroups (33%/67%, 92%/8%, 69%/31%) vary considerably. Unisex mortality differences have been eliminated from the remainder of the study on the grounds that they may not be representative of results for a larger population.

Differences due to the use of interest rates at the beginning of the calendar year or at some other date prior to the actual cashout date have also been eliminated from the remainder of the study. The majority of the plans with cashouts utilized interest rates for the month prior to the month of cashout. Results for the cases with larger lags were adjusted to this basis for the remainder of the report.

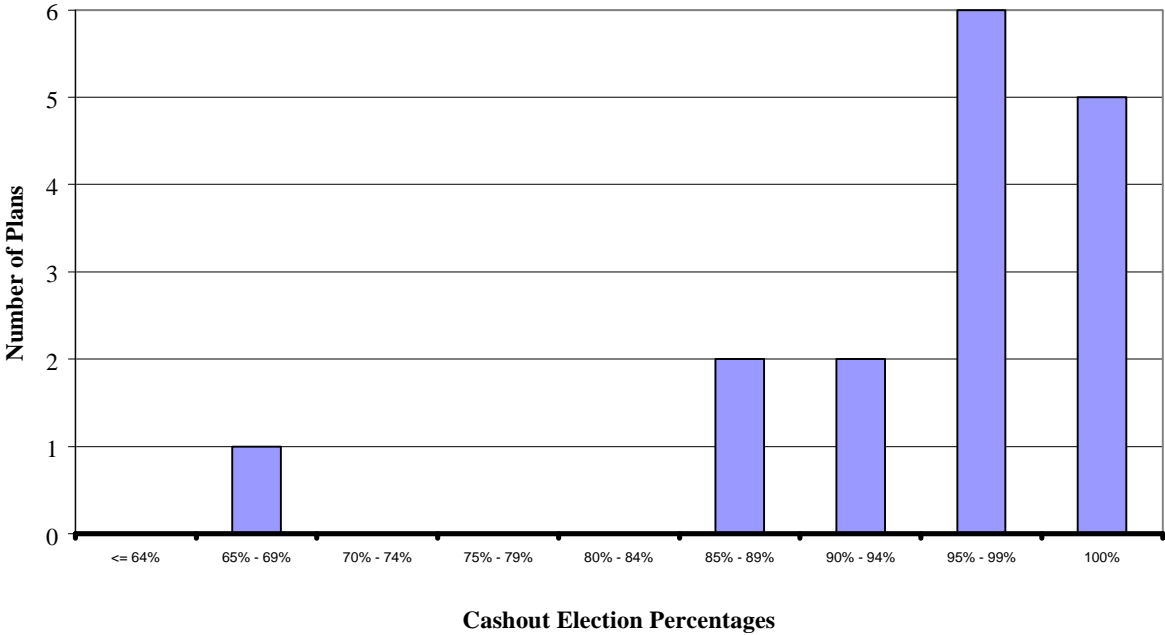
⁷ Not subtractive in all cases due to impact of changing both numerator and denominator of PBGC Ratio

4.3.2 Cashout Election Rates

For the 21 plans in the study that provided their termination costs broken down between annuities and cashouts, cashouts represented, on average, 62% of total plan termination costs. Since many of these plans did not allow retirees to elect lump sums, the 62% ratio indicates that a large proportion of employees and vested terminations elected to cashout.

The election rates for the 16 plans that provided individual data for both annuitants and cashouts indicated that, given the choice, participants overwhelmingly elected to cash out their accrued benefits. The election percents are shown in Figure 5. The mean percentage election rate for actives and vested terminations was 94%. In the two plans that offered lump sums to retirees, the average election rate was 37% (by plan: 35% and 38%).

Figure 5 - Cashout Election Percentages for Deferred Annuitants (Actives and Vested Terminations)



4.4 Conclusions

- Given the opportunity, a significant percentage of participants in the plans contained in the study elected to cash out their accrued benefits.
- For this sample of cases, the relationship of PBGC plan termination costs to cashout amount is heavily dependent on the interest rate and mortality basis used in calculating cashout amounts (GATT vs. “Old PBGC”). For GATT basis cashouts, the average PBGC Plan Termination Ratios were 1.17 and 1.21, depending on whether or not early retirement was recognized. For “Old PBGC” basis cashouts, the average PBGC Ratio was .91.

Comparison of Total Settlements with PBGC Valuation Results

5.1 Data

Individual data was supplied for a total of 17 plans. It is summarized below in Table 8 by number of participants per plan.

Table 8: Distribution of Number of Participants by Plan

Number of Participants	Number of Plans
1 - 24	4
25 - 99	3
100 - 999	9
$\geq 1,000$	1
Total	17

5.2 Calculation Results

PBGC plan termination costs were summed for cashouts and annuitants. These valuation results were then compared to the total actual settlement amounts.

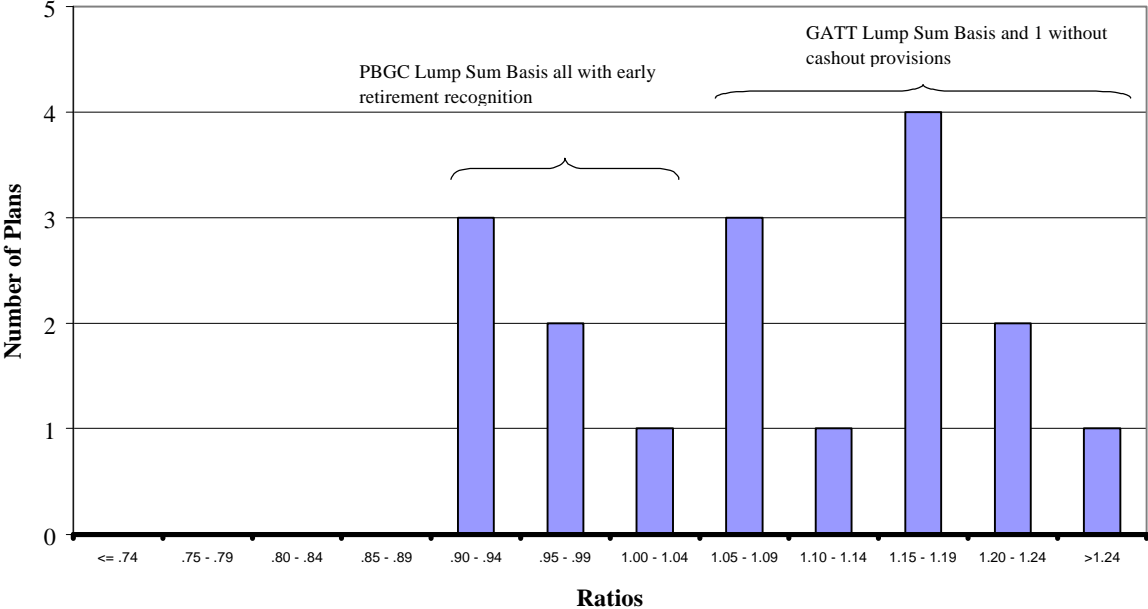
To facilitate the comparison, the ratio of:

- (1) The PBGC plan termination costs for cashouts and annuitants and
- (2) The actual settlement amounts, including cashouts with the adjustments outlined in Section 4,

was calculated. As in the previous sections, this ratio is referred to as the “PBGC Plan Termination Ratio.” A “PBGC Plan Termination Ratio” greater than 1.0 indicates that estimated PBGC plan termination costs were higher than the total settlement amount paid upon plan termination.

Figure 6 on the next page shows the actual distribution of PBGC Plan Termination Ratios for the 17 plans. When compared to the earlier results for annuity settlements, the introduction of the cashout element increases the variation in results between plans.

Figure 6 - Ratios of PBGC Cost to Plan Termination Costs for Annuity and Cashout Settlements Combined



5.3 Analysis

Average results are summarized by cashout type in Table 9. Again, the type of cashout plays an important role in the comparison of the final settlement amount to the estimated PBGC plan termination cost. In making comparisons between results for annuities and cashouts it should be noted that the annuitized group is composed primarily of immediate annuities, while the cashout group is composed primarily of deferred annuitants.

Table 9: PBGC Plan Termination Ratios by Cashout Basis

Cashout Basis	Plans	Cashout Elections ⁸	Average PBGC Plan Termination Ratio For:		
			Annuities	Cashouts	Plan
1) GATT Lump Sum	4	94%	1.03	1.17	1.13
2) GATT Lump Sum w/ER	6	97%	1.04	1.21	1.17
3) PBGC Lump Sum w/ER	6	92%	1.04	.91	.96
4) Only Annuities	<u>1</u>	NA	<u>1.16</u>	<u>NA</u>	<u>1.16</u>
Total	17		1.05	1.08	1.09

5.4 Conclusion

- For the plans in this study offering GATT minimum lump sums at plan termination, cashouts appear to have a significant impact on actual settlement costs; however, any comparison of annuity and cashout results should consider the different demographics of the two groups.

⁸ Percentages of active and vested terminated participants electing to cash out. In addition, one plan in Cashout Basis Group 1) and one plan in Cashout Basis Group 2) allowed cashouts by retirees.

Appendix A – Actuarial Assumptions

XRA – Calculated according to PBGC Regulations. Participants actively employed at the plan termination were assumed to remain employed until retirement, unless the plan termination was due a stock sale or a plant closing or the annuity bid specifications indicated that future service did not apply towards early retirement eligibility.

Interest Rates – PBGC interest rates for annuities as of the date of settlement. Cashouts by the PBGC of amounts under \$5,000 were ignored.

Mortality –

For settlements on or after November 1, 1993:

Healthy Lives – 1983 GAM Male Table with 6-year setback for females

Disabled Lives – PBGC disability mortality rates for retirees not eligible for Social Security Disability Benefits.

For settlements before November 1, 1993:

Healthy Lives – UP-1984 Mortality Table on sex distinct basis

Disabled Lives – UP-1984 table set forward 3 years for males and females

PBGC Administrative Expenses – Calculated according to PBGC Regulations. Figures for annuitized lives and cashouts utilize the formula, which is weighted more heavily for present values under \$200,000, independently based on the present value for the type of settlement under consideration. Combined plan results utilize the formula based on total plan liabilities.

Joint and Survivor Forms and REA Death Benefits – Load of .7%, based on valuations of joint and survivor forms and REA death benefits for 17 cases using PBGC assumptions which are:

Percent Married – 100%

Spouse age Difference – Husband 4 years older than wife.

Appendix B –Plan Provisions

Pertinent plan provisions are summarized in the tables below. Early retirement schedules of outliers are in **bold**.

Table B.1 – Normal and Early Retirement Provisions

Type of Retirement Provisions:			Number Of Plans That Provided Data For:		
NRA	ERA	Reduction	Annuitants	Cashouts	Both Annuitants and Cashouts
			1	0	0
65,	any,	Act Equiv	1	0	0
65,	55,	Act Equiv	3	0	0
65,	55/10,	Act Equiv	3	1	1
62,	58,	Act Equiv	1	1	1
65,	55,	6.67%	1	0	0
65,	62,	6.67%	0	1	1
65,	60/10,	6.67%	0	1	1
65,	62/10,	6.67%	1	1	1
65,	55,	6.67%/3.33%	2	1	2
65,	55/5,	6.67%/3.33%	2	0	0
65,	55/10,	6.67%/3.33%	3	3	3
65,	55/15,	6.67%/3.33%	1	0	0
65,	60/5,	6.67%/3.33%	1	1	1
65,	60/15,	6.67%/3.33%	1	1	1
64,	55,	6.67%/3.33%	1	1	1
65,	55,	6.00%	1	0	0
65,	55/5,	6.00%	1	1	1
65,	55/10,	6.00%/4.00%	1	0	0
65,	55,	6.00%/3.36%	1	1	1
65,	55/10,	6.00%/3.00%	1	1	1
65,	55/10,	5.00%	1	1	1
65,	55/15,	4.00%	1	0	0

65, 55/30,	3.00%/5.00%	1	0	0
65, 55/10,	Act Equiv			
Prior Plan:	3%/5%	1	0	0
65, any age*,	Act Equiv			
or 62, 55/10,	5.00% (for actives)	1	0	0
65, 55,	6.00%(salaried)			
or 65, 55,	Act Equiv (union)	1	0	0
65, < 55*,	Act Equiv			
or 55*,	6.67%/3.33%	<u>1</u>	<u>0</u>	<u>0</u>
Total		35	16	17

* Termination of employment not required

Table B.2. -- Normal Form of Payment of Retirement Benefits

Normal Form	Number of Cases
Straight Life	29
10yr C&L	8
5yr C&L	<u>1</u>
Total	38

Table B.3. -- Automatic Form of Retirement Benefits for Married Participants

Automatic Form	Number of Cases
50% Joint & Survivor	35
100% Joint & Survivor	<u>3</u>
Total	38

Table B.4. -- Deferred Lump Sums after Annuity Purchase

Automatic Form	Number of Cases
Not available or for small amounts	31
Available w/o termination of employment	2
Available at termination of employment	<u>5</u>
Total	38