The Economics of Pension Insurance

Richard A. Ippolito
Chief Economist
Pension Benefit Guaranty Corporation

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PART FOUR

Appendixes

APPENDIX A

Statistical Tables

TABLE A–1 Trends in Employment and Wages

	*Employment**		*Nominal Wage†*		*CPI*		*Real Wage Change*
Year	*Number*	*Percent Change*	*Hourly*	*Percent Change*	*Index*	*Percent Change*	
1950	58.9	2.2%	$1.33	3.7%	72.1	1.0%	2.7%
1951	59.9	1.6	1.45	7.5	77.8	7.9	−.4
1952	60.2	.5	1.52	5.1	79.5	2.2	2.9
1953	61.1	1.4	1.61	5.6	80.1	.8	4.8
1954	60.1	−1.6	1.65	3.3	80.5	.5	2.8
1955	62.1	3.3	1.71	3.5	80.2	−.4	3.9
1956	63.7	2.5	1.80	4.9	81.4	1.5	3.4
1957	64.1	.6	1.89	5.0	84.3	3.6	1.4
1958	63.0	−1.7	1.95	4.2	86.6	2.7	1.5
1959	64.6	2.5	2.02	3.5	87.3	.8	2.7
1960	65.7	1.7	2.09	3.4	88.7	1.6	1.8
1961	65.7	0.0	2.14	3.0	89.6	1.0	2.0
1962	66.7	1.5	2.22	3.4	90.6	1.1	2.3
1963	67.7	1.4	2.28	2.8	91.7	1.2	1.6
1964	69.3	2.3	2.36	2.8	92.9	1.3	1.5
1965	71.1	2.5	2.46	3.6	94.5	1.7	1.9
1966	72.8	2.3	2.56	4.3	97.2	2.9	1.4
1967	74.3	2.1	2.68	5.0	100.0	2.9	2.1
1968	75.9	2.1	2.85	6.1	104.2	4.2	1.9
1969	77.9	2.6	3.04	6.7	109.8	5.4	1.3
1970	78.6	.9	3.23	6.6	116.3	5.9	0.7
1971	79.3	.8	3.45	7.2	121.3	4.3	2.9
1972	82.1	3.5	3.70	6.2	125.3	3.3	2.9
1973	85.0	3.5	3.94	6.2	133.1	6.2	0.0
1974	86.7	2.0	4.24	8.0	147.7	11.0	−3.0
1975	85.8	−1.0	4.53	8.4	161.2	9.1	−.7
1976	88.7	3.5	4.86	7.2	170.5	5.8	1.4
1977	92.0	3.7	5.25	7.6	181.5	6.5	1.1
1978	96.0	4.3	5.69	8.2	195.4	7.7	.5
1979	98.8	2.9	6.16	7.9	217.4	11.3	−3.4
1980	99.3	.5	6.66	9.0	246.8	13.5	−4.5
1981	100.4	1.1	7.25	9.1	272.4	10.4	−1.3
1982	99.5	−.8	7.68	6.9	289.1	6.1	.8
1983	100.8	1.3	8.02	4.6	298.4	3.2	1.4
1984	105.0	4.1	8.32	3.2	311.1	4.3	−1.1
1985	107.1	2.0	8.57	3.1	322.2	3.6	−.5
1986	109.5	2.2	8.76	2.4	328.4	1.9	.5
1987	112.4	2.6	8.98	2.5	340.4	3.6	−1.1
Annualized		1.7%		5.1%		4.1%	1.07%

*Civilian work force, in millions.

†Private, nonagricultural.

SOURCE: *Economic Report of the President*, 1988.

TABLE A–2 Employment in Small and Large Establishments (absolute numbers in millions)

		Workers per Establishment			
		Number		*Percent*	
Year	*Total*	*1–99*	*1,000+*	*1–99*	*1,000+*
1974	63.4	33.3	10.1	52.5%	15.9%
1975	60.4	32.6	9.3	53.9	15.3
1976	62.5	33.9	9.2	54.2	14.7
1977	64.9	35.4	9.4	54.5	14.4
1978	70.2	38.3	10.1	54.5	14.3
1979	74.5	40.3	10.9	54.0	14.6
1980	74.8	40.6	10.7	54.2	14.3
1981	74.7	40.7	10.6	54.4	14.1
1982	74.2	41.0	10.4	55.2	14.0
1983	72.8	40.9	10.0	56.2	13.7
1984	77.9	43.6	10.4	55.9	13.3
1985	81.1	45.3	10.4	55.8	12.8

SOURCE: U.S. Census, *County Business Patterns, Annual Summary*, 1986.

TABLE A–3 Growth in Participants in Insured Defined Benefits Plans (absolute numbers in millions)

	Participants per Plan							
	1–99		*100–999*		*>999*		*Total*	
Year	*Number*	*Percent Change*	*Number*	*Percent Change*	*Number*	*Percent Change*	*Number*	*Percent Change*
1974	1.25	—	4.28	—	17.3	—	22.9	—
1975	1.38	9.9%	4.68	9.1%	18.8	8.6%	24.9	8.7%
1976	1.42	3.0	4.86	3.8	19.4	3.2	25.6	3.1
1977	1.43	.8	4.90	.8	18.7	−3.6	25.0	−2.4
1978	1.41	−1.6	4.98	1.5	18.8	0.5	25.2	.5
1979	1.46	3.5	5.25	5.4	19.8	5.3	26.5	5.4
1980	1.59	8.8	5.49	4.5	21.0	6.0	28.1	5.7
1981	1.63	2.0	5.64	2.8	21.8	3.8	29.1	3.7
1982	1.69	3.9	5.77	2.2	22.2	1.8	29.6	1.8
1983	1.72	1.8	5.76	−.2	22.5	1.3	30.0	1.1
1984	1.69	−1.8	5.69	−1.1	22.8	1.3	30.2	.8
1985	1.60	−5.2	5.68	−.4	23.3	2.1	30.6	1.3
1986	1.58	−1.2	5.58	−1.8	23.8	2.1	31.0	1.3

Note: Percent calculations may not correspond precisely to absolute numbers owing to rounding of absolute number.

SOURCE: PBGC Premium Payers database.

TABLE A–4 Pension Plan Terminations and Formations (participant numbers in thousands)

	Defined Benefit			*Defined Contribution*			*DB : DC (Columns)*		
	Formations		*Terminations*	*Formations*		*Terminations*			
Year	*Plans (1)*	*People (2)*	*Plans (3)*	*Plans (4)*	*People (5)*	*Plans (6)*	*1 : 4 (7)*	*2 : 5 (8)*	*3 : 6 (9)*
1975	15,549	627	4,588	17,038	166	3,598	.9	3.7	1.3
1976	4,889	279	9,024	21,030	813	6,889	.2	.3	1.3
1977	6,953	1,639	5,337	28,463	3,315	10,478	.2	.5	.5
1978	9,728	1,125	4,625	55,956	2,754	10,661	.2	.4	.4
1979	15,755	972	3,267	41,122	1,050	7,574	.4	.9	.4
1980	18,849	1,784	4,297	50,493	1,997	8,982	.4	.9	.5
1981	23,789	2,185	4,536	57,748	1,302	8,906	.4	1.6	.5
1982	28,189	1,324	5,043	57,162	1,428	10,108	.5	.9	.5
1983	22,130	1,946	7,230	42,089	1,927	11,417	.5	1.0	.6
1984	12,807	1,335	9,153	28,279	4,345	11,019	.5	.3	.8
1985	17,267	806	12,215	30,355	3,265	13,819	.6	.2	.9
1986	22,076	5,036	10,724	45,061	3,168	14,612	.5	1.6	.7
1987	12,778	4,597	6,584	29,935	8,498	9,318	.4	.5	.7

SOURCE: Internal Revenue Service qualifications data.

TABLE A–5 Distribution of Plans, by Industry

Industry	*Vesteds*	*Funding Ratio*	*Liabilities per Vested*
Manufacturing	59.4%		
Food and kindred products	3.5%	138.7%	$27,810
Textile mill products	1.3	137.7	9,165
Apparel and other textiles	.6	133.5	9,300
Lumber and wood products	.7	152.0	13,086
Paper and allied products	2.6	118.9	26,268
Printing and publishing	1.7	149.2	24,296
Chemical and allied products	5.6	147.7	42,121
Petroleum refining	2.6	145.1	60,969
Rubber and plastics	1.4	135.9	32,417
Leather products	.5	125.2	10,345
Stone, clay, glass, and concrete	1.5	123.1	31,337
Ferrous metals (steel)	3.9	111.1	59,925
Nonferrous metals	.6	130.1	47,468
Fabricated metal products	3.7	130.7	27,517
Machinery (not electrical)	5.2	134.2	34,890
Electrical and electronic machinery	7.7	142.9	30,546
Motor vehicles (auto)	10.7	127.9	48,296
Other transportation equipment	2.9	141.7	36,084
Instruments, photo, medical, etc.	2.7	145.4	29,969
Agriculture, forestry, fishing	.2	145.6	24,729
Mining	.7	170.7	31,125
Construction	.4	159.0	25,513
Transportation, communications, utilities	13.4	148.3	51,612
Wholesale trade	.9	162.3	18,850
Retail trade	5.8	152.5	11,060
Finance, insurance, real estate	7.8	178.0	35,528
Services	5.8	172.7	15,902
Tax-exempt organizations	1.3	163.7	31,498
Other	4.3	N/A	N/A
Total (weighted)	100.0%	148.9%	$35,183

SOURCE: 1984 Form 5500 Annual Pension Plan Reports, projected to 1986.

TABLE A–6 Distribution of Plans, by Size (percent)

Size†	*Plans*	*Participants*	*Assets*	*Liabilities**	*Funding Ratio*
Less than 250	33.7%	3.0%	1.7%	1.7%	131%
250–499	24.2	4.7	2.6	2.6	129
500–999	17.4	6.4	4.0	3.8	130
1,000–2,499	14.1	10.8	7.8	7.2	134
2,500–4,999	5.1	8.8	7.7	7.3	132
5,000–9,999	2.8	10.0	9.5	8.8	133
10,000–24,999	1.7	13.8	14.6	14.5	124
25,000 or more	1.0	42.5	52.1	54.1	119
Total	100.0%	100.0%	100.0%	100.0%	124%

*Liabilities converted to 7.25 percent interest rate.

†Participants per plan.

SOURCE: Form 5500 Annual Pension Plan Reports, 1984, projected to 1986.

TABLE A–7 Distribution of Termination Funding Ratios, 1978–1986 (dollars in billions)

	Percent Participants								
Funding Ratio	*1978*	*1979*	*1980*	*1981*	*1982*	*1983*	*1984*	*1985*	*1986 (est.)*
0–24%	.8%	.8%	2.4%	.3%	.3%	.3%	.3%	.3%	.3%
25–49	8.8	9.7	3.8	2.6	2.5	2.0	1.6	1.8	2.6
50–74	14.2	16.0	11.5	8.3	8.0	7.6	2.8	3.7	8.3
75–99	24.6	26.5	17.1	10.4	9.3	6.7	9.0	9.5	10.8
100–124	25.5	25.8	22.9	14.1	14.2	13.4	10.1	11.7	16.3
125–149	14.9	11.7	22.1	20.1	19.5	18.2	12.2	16.5	18.5
150+	11.1	9.2	22.0	44.1	46.1	51.7	63.8	56.4	43.2
Average	92.9%	88.5%	107.2%	128.8%	130.9%	139.2%	153.9%	145.6%	128.5%
Underfunding ($1986)*	$116.7	$126.0	$73.0	$42.1	$39.5	$35.8	$25.9	$31.8	$49.2
Interest rate†	7.25%	7.50	8.75	10.25	10.75	9.25	10.00	9.75	7.75

*Exposure is adjusted to 1986 dollars and size of pension universe. Funding ratios are calculated for each year using a constant 2 percent discount rate. Assets in year *t* are then set equal to assets in 1986 times the real funding ratio in year *t* divided by the same ratio in 1986. Liabilities in year *t* are set equal to those in 1986 but adjusted to the PBGC immediate annuity rates shown in the table.

†Average PBGC immediate annuity rate during year.

SOURCE: Form 5500 Annual Pension Plan Reports.

TABLE A–8 Distribution of Ongoing Funding Ratios, 1978–1986 (dollars in billions)

	Percent Participants								
Funding Ratio	*1978*	*1979*	*1980*	*1981*	*1982*	*1983*	*1984*	*1985*	*1986 (est.)*
0–24%	2.8%	3.3%	2.4%	2.0%	2.0%	.9%	.8%	.9%	.9%
25–49	16.5	22.2	15.3	13.1	13.2	10.4	10.0	10.1	10.1
50–74	36.4	39.5	34.9	27.5	27.6	18.6	16.9	17.1	16.8
75–99	30.2	25.6	31.1	32.1	33.2	29.3	27.3	28.1	27.3
100–124	9.1	6.1	10.6	16.4	16.4	24.4	25.6	25.1	25.6
125–149	2.6	2.0	3.0	5.2	5.1	9.8	11.2	11.0	11.2
150+	2.4	1.3	2.7	3.8	3.6	6.5	8.0	7.6	8.0
Average	65.3%	60.3%	67.3%	74.4%	74.1%	84.3%	87.5%	86.5%	87.2%
Underfunding ($1986)*	$343.0	$387.5	$325.8	$268.5	$272.4	$203.5	$187.6	$191.3	$189.3

*Underfunding is adjusted to 1986 dollars and size of pension universe, as described in notes to Table A–7, except liabilities in all years are fixed at 1986 levels.

SOURCE: Form 5500 Annual Pension Plan Reports.

TABLE A–9 Reversions in Excess of $1 Million, 1980–1987 (dollars in millions)

Year	*Number of Plans*	*Assets*	*Benefits*	*Reversion*	*Participants*
1980	9	$ 58	$ 40	$ 18	22,242
1981	35	341	183	159	30,512
1982	82	1,136	733	404	123,587
1983	166	3,431	1,823	1,608	168,549
1984	331	7,426	3,862	3,564	382,188
1985	580	15,060	8,393	6,666	693,553
1986	263	8,918	4,630	4,287	262,255
1987	169	3,706	2,279	1,426	159,822
Total	1,635	$40,079	$21,945	$18,134	1,842,708

SOURCE: PBGC, *Annual Report*, 1987.

TABLE A–10 Claims Experience: Single-Employer Program (dollars in millions)

Fiscal Year	*Number of Plans*	*Guaranteed Benefit Liability*	*Plan Assets*	*Funding Ratio*	*Employer Liability*	*Claims Total*	*Claims per Plan*
1975	98	$ 56	$ 19	34%	$ 4	$ 32	$0.3
1976	172	88	45	51	25	18	0.1
1977	129	51	21	40	8	23	0.2
1978	102	125	46	37	7	72	0.7
1979	78	81	32	40	4	45	0.6
1980	100	166	77	46	5	84	0.8
1981	135	178	75	42	27	76	0.6
1982	128	461	174	38	7	280	2.2
1983	140	408	224	55	10	174	1.2
1984	90	47	20	42	1	27	0.3
1985	88	262	75	29	4	183	2.1
1986	86	1,140	375	33	193	573	6.7
1987	30	153	48	32	1	104	3.5
Pending 1987	29	663	346	52	6	312	N/A
Total	1,405	$3,880	$1,576	41%	$300	$2,003	N/A
(Steel Plans)	(183)	(2,110)	(727)	(34%)	(217)	(1,165)	(6.4)

Note: Date for 1986 does not include claims made by LTV Corporation for pension plans later restored by the PBGC.

SOURCE: PBGC, *Annual Report*, 1987.

TABLE A–11 Distribution of Net Claims by Size, 1986 (dollars in millions)

	Guaranteed Benefit Liability		*Net Claim (event basis)**	
Size	*Plans*	*Liability*	*Events*	*Claims*
Greater than $100	9	$4,708	5	$2,788
$50–100	8	518	6	351
$25–50	20	662	7	254
$10–25	23	369	10	134
$5–10	37	255	11	76
$2–5	73	234	41	131
$1–2	109	159	45	61
Less than $1	1,066	190	968	105
Total	1,345	$7,095	1,093	$3,900

* A single insurable event such as bankruptcy of plan sponsor may involve termination of several insufficient pension plans.

SOURCE: PBGC, *Annual Report*, 1986.

TABLE A–12 PBGC Financial Summary: Single-Employer Fund, 1975–1987 (dollars in millions)

Year	Total Assets	Reserve for Guaranteed Benefits	Accumulated Results of Operations (loss)	Premium Income
1987	$2,163.3	$3,629.3	($1,548.6)*	$267.6
1986	1,740.3	5,491.8	(3,826.4)	201.4
1985	1,154.6	2,447.0	(1,325.3)	81.7
1984	1,063.3	1,496.6	(462.0)	80.5
1983	1,084.9	1,570.0	(523.3)	81.5
1982	772.8	1,076.0	(332.8)	79.6
1981	467.4	673.0	(188.8)	75.0
1980	429.5	506.0	(94.6)	71.2
1979	332.3	460.0	(146.4)	69.7
1978	244.6	365.0	(137.8)	47.4
1977	175.8	260.0	(95.3)	25.1
1976	127.3	159.0	(41.0)	29.7
1975	56.6	58.3	(15.7)	18.5

*The reduction from 1986 to 1987 includes the restoration of three terminated plans to LTV Corporation. See Appendix D.

SOURCE: PBGC, *Annual Reports.*

TABLE A–13 Largest 100 Claims Excluding LTV*, 1974–1987 (dollars in millions)

Plan Name	Date of Termination§	Plan Assets	Reserve for Guaranteed Benefits	Plan Underfunding	Funding Ratio
WPSC†—Ohio Valley	11/08/85	$83.5	$339.0	$255.6	24.6%
Republic Steel	09/30/86	6.0	225.2	219.2	2.7
Kaiser Steel Hourly	07/28/87	27.9	228.9	201.0	12.2
Allis-Chalmers Hourly	07/26/85	2.3	176.1	173.8	1.3
WPSC†—Mon Valley	11/08/85	51.5	212.9	161.4	24.2
WPSC† Retirement Income	11/08/85	33.6	127.1	93.5	26.4
Rath Packing Co.	09/13/82	5.6	60.9	55.4	9.1
Wisconsin Steel Nonunion	05/16/80	32.3	87.6	55.3	36.9
White Motor Co. Cleveland Union	11/30/81	11.4	57.1	45.7	19.9
Alan Wood Steel Co. Hourly	11/01/77	7.0	41.8	34.8	16.8
Continental Steel	02/14/86	22.1	56.3	34.2	39.3
Mesta Machine Hourly	06/16/83	19.7	53.8	34.1	36.7
White Farm Hourly	09/14/82	5.2	37.9	32.7	13.6

ABLE A–13 (*continued*)

lan Name	*Date of Termination*[§]	*Plan Assets*	*Reserve for Guaranteed Benefits*	*Plan Underfunding*	*Funding Ratio*
aiser Steel Salaried	02/28/87	0.0	31.5	31.5	0.0
entury Brass Products, Inc.	12/02/85	6.8	36.6	29.7	18.7
TV—Reserve Mining Hourly‡	05/24/87	44.0	72.7	28.7	60.5
lcLouth Steel Hourly	11/30/82	37.7	64.8	27.1	58.2
llis-Chalmers —Salaried	12/17/87	177.0	202.3	25.3	87.5
raniff Airways	08/23/82	10.9	36.0	25.1	30.2
lansfield Tire & Rubber Co.	06/30/79	3.7	27.6	24.0	13.3
hoenix Steel Claymont Union	08/22/83	3.8	26.6	22.8	14.4
raniff Airways Teamsters Plan	08/23/82	7.6	29.6	21.9	25.8
acet Enterprises Hourly	11/13/80	17.9	39.6	21.7	45.2
enn Dixie Cement Hourly	05/10/81	4.1	23.5	19.4	17.4
Vhite Motor Corp. Salaried	11/30/81	10.2	28.9	18.6	35.5
uto Specialties Mfg. Unit	12/20/86	5.1	23.0	17.9	22.2
hoenix Steel— Phoenixville	08/22/83	7.3	25.2	17.9	29.0
Vhite Farm —Salaried	09/04/82	6.2	23.4	17.2	26.3
lcLouth Steel —Salaried	11/30/82	15.1	30.0	15.0	50.2
ity Stores, Inc.	10/27/80	0.1	15.0	14.9	0.6
leppenstall Co. Hourly	05/31/79	0.2	14.1	13.9	1.1
lackintosh— Hemphill	01/31/87	5.0	18.6	13.6	27.0
hase Brass and Copper Co.	06/28/76	3.2	16.5	13.3	19.3
Vashburn Wire	10/31/76	1.2	14.4	13.2	8.1
raniff Airways, Management	08/23/82	18.8	31.4	12.6	59.9
ontinental Steel Corp. Plan B	02/14/86	11.3	23.7	12.4	47.8
ubuque Packing Co.	11/01/82	40.8	52.4	11.6	77.8
RBS Industries	10/10/86	8.6	19.9	11.3	43.0
ngersoll Products Corp.	12/31/85	1.2	11.8	10.6	10.2
iamond REO Trucks, UAW	05/31/75	1.4	11.4	9.9	12.6

TABLE A–13 (*continued*)

Plan Name	Date of Termination§	Plan Assets	Reserve for Guaranteed Benefits	Plan Underfunding	Funding Ratio
Alliance Machine Hourly	05/31/87	2.9	12.4	9.5	23.6
Lundberg. Industries	09/24/87	5.1	13.8	8.7	36.8
Rath Packing Co.	09/13/82	6.0	14.5	8.5	41.3
National Sugar Refining Co.	06/20/82	6.1	14.6	8.5	41.9
AM International	10/15/82	16.6	25.0	8.4	66.4
WPSC†—Monessen	11/08/85	6.8	15.2	8.4	45.0
LTV—Continental EMSCO‡	04/30/88	1.5	9.9	8.4	14.9
Donner Hanna Coke Hourly	12/01/87	3.4	10.8	7.5	31.1
LTV—Reserve Mining—Salaried‡	03/25/87	35.0	42.4	7.4	82.5
Driver Harris Hourly	11/12/85	1.9	9.3	7.3	21.0
Lebanon Steel Bargaining	07/31/83	2.3	9.1	6.8	25.8
White Motor Co. Hourly	11/30/81	−0.1	6.5	6.5	−0.8
Washburn Wire	10/01/79	0.0	6.4	6.4	0.0
White Farm —Hopkins	09/14/82	1.0	7.3	6.3	13.4
Jones & Lamson Machinery	10/09/87	3.9	10.2	6.3	38.2
Volco Steelworkers	10/22/85	0.3	6.1	5.8	5.7
Central Foundry Co. Molders	05/18/81	0.0	5.8	5.8	0.2
Alan Wood Steel Salaried	11/01/77	2.5	8.2	5.7	30.8
Johnson Steel and Wire Co.	09/13/82	1.8	7.5	5.7	24.1
Energy Cooperative	12/04/81	3.7	9.3	5.6	39.5
Allis-Chalmers —Harvey	12/17/87	9.6	15.1	5.5	63.4
Auto Specialty Management	12/20/86	2.2	7.6	5.5	28.3
Chicago West Pullman	05/16/80	11.3	16.6	5.4	67.8
Acme—Hamilton Local 95	05/15/78	0.3	5.5	5.1	5.8
Jeanette Corp. Union	05/31/83	2.6	7.8	5.1	33.9
Mid-Vale Heppenstall	04/30/76	0.5	5.6	5.1	9.2
Wieboldt Stores	07/11/87	5.0	9.9	5.0	49.9
Marhoefer Packing Co.	05/19/78	2.8	7.7	5.0	35.8

TABLE A–13 *(continued)*

Plan Name	*Date of Termination*[§]	*Plan Assets*	*Reserve for Guaranteed Benefits*	*Plan Underfunding*	*Funding Ratio*
Kaiser Steel Fabricating	07/28/87	2.2	6.9	4.7	31.9
AlloyTek, Inc., Hourly	10/31/79	0.5	5.1	4.6	9.7
New Jersey Brewery	12/31/77	9.0	13.3	4.3	67.4
Kaiser Steel, Napa	08/03/87	2.2	6.4	4.2	34.6
Continental Steel Corp. Joliet	02/14/86	2.3	6.4	4.1	35.7
Maryland Glass Corp. Hourly	02/25/81	3.2	7.3	4.1	44.3
Ironton Coke Corp.—Hourly	05/06/82	1.1	5.1	4.0	22.3
Gateway Transportation	06/15/82	0.1	4.1	4.0	2.9
The Union Metal Manufacturing	05/15/85	5.7	9.6	3.9	59.1
McKeesport Steel Casting	04/13/84	0.2	4.1	3.9	5.2
United Steel & Wire Hourly	08/09/85	1.8	5.7	3.9	31.9
Alliance Machine Salaried	05/31/87	2.6	6.4	3.8	39.9
Hotel and Restaurant Employees	09/30/77	0.0	3.7	3.7	0.0
Mullins Mfg.	04/30/75	0.9	4.5	3.6	20.2
Adirondack Foundries Hourly	12/31/87	1.9	5.4	3.6	34.4
New Jersey Zinc	01/01/83	1.2	4.8	3.6	25.5
Retail Clerks Union 1357	10/27/80	0.0	3.5	3.5	0.2
Airlift International	03/25/82	6.4	9.9	3.5	64.4
Van Huffel Tube	11/30/85	12.4	15.9	3.5	78.2
White Motor Co. Salary	11/30/81	0.1	3.3	3.2	2.4
Godchaux-Henderson	05/31/85	1.2	4.4	3.2	27.6
Schatz Federal Bearing Co.	02/20/81	2.4	5.6	3.2	43.1
Lebanon Steel Foundry	06/30/83	4.6	7.8	3.2	59.4
Amerace Corp.	07/31/74	0.9	4.0	3.1	22.6
Evans Products Co. Local 2340	07/31/76	2.1	5.2	3.1	40.1
Dayton Walther Corp. Dayton	10/31/84	9.0	12.1	3.1	74.4
Universal Foundry Co.	04/08/85	0.9	4.0	3.1	23.1

TABLE A–13 *(concluded)*

Plan Name	Date of Termination[§]	Plan Assets	Reserve for Guaranteed Benefits	Plan Underfunding	Funding Ratio
Bristol Industries	01/21/83	2.2	5.1	2.9	43.0
Bohack Corp. Nonbargaining	10/31/77	0.0	2.8	2.8	1.2
Standard Tube of Detroit	12/30/83	0.0	2.8	2.7	1.2
Williams Press	12/13/85	0.0	2.7	2.7	1.2
PF Industries Bristol Plant	01/30/81	1.8	4.5	2.7	40.9
Totals—Largest 100 Plans		$971.3	$3,167.4	$2,196.2	30.6%
Totals—All Terminations		$1,353.2	$3,879.6	$2,526.4	34.8%
Percentage Largest Plans to All Terminations		71.8%	81.6%	86.9%	

Note: Duplicate names may appear in list: This is because a single insurance event like bankruptcy of a plan sponsor may result in more than one terminated underfunded pension plan.

*Claims are measured as plan underfunding at date of termination. Claims amounts, on average, are 20 percent lower than total underfunding. This is because some portion of underfunding is paid by plan sponsors before a final settlement is reached with the PBGC.

†WPSC: Wheeling-Pittsburg Steel Company.

‡Entry is not one of the four so-called LTV terminations in 1986.

§Termination dates after 9/30/87 are estimates of termination dates for pending cases as of the end of the 1987 fiscal year.

TABLE A–14 Participants in Pay Status

Year	Participants in Pay Status	Amount Paid (millions)	Average	
			$ Current	$ 1986
1975	N/A	$ 1.5	—	—
1976	N/A	9.5	—	—
1977	N/A	13.0	—	—
1978	N/A	28.1	—	—
1979	N/A	32.3	—	—
1980	28,000	36.2	$1,292	$1,699
1981	36,400	56.8	1,560	1,884
1982	50,900	94.2	1,850	2,110
1983	55,400	136.6	2,465	2,692
1984	64,700	169.3	2,616	2,754
1985	74,800	170.2	2,275	3,325
1986	90,750	260.5	2,870	2,870
1987	109,700	300.2	2,736	2,631

SOURCE: PBGC, *Annual Reports.*

TABLE A–15 Maximum Monthly Benefits, by Year

	Age of First Receipt	
Year	*55*	*65*
1974	$337	$ 750
1975	360	801
1976	391	869
1977	421	937
1978	452	1,005
1979	483	1,073
1980	521	1,159
1981	567	1,261
1982	621	1,380
1983	682	1,517
1984	721	1,602
1985	759	1,687
1986	805	1,789
1987	836	1,857
1988	859	1,909

TABLE A–16 Stock Price Indexes, 1950–1986

Year	*NYSE Composite*	*Dow Jones Industrial*	*S&P Composite*	*CPI Index*
1950	10.8	216.3	18.4	72.1
1951	13.0	257.6	22.3	77.8
1952	13.8	270.7	24.5	79.5
1953	13.6	275.9	24.7	80.1
1954	16.1	333.9	29.6	80.5
1955	21.5	442.7	40.4	80.2
1956	24.4	493.0	46.6	81.4
1957	23.6	475.7	44.3	84.3
1958	24.5	491.6	46.2	86.6
1959	30.7	632.1	57.3	87.3
1960	30.0	618.0	55.8	88.7
1961	35.3	691.5	66.2	89.6
1962	33.4	639.7	62.3	90.6
1963	37.5	714.8	69.8	91.7
1964	43.7	834.0	81.3	92.9
1965	47.3	910.8	88.1	94.5
1966	46.1	873.6	85.2	97.2
1967	50.7	879.1	91.9	100.0
1968	55.3	906.0	98.7	104.2
1969	54.6	876.7	97.8	109.8
1970	45.7	753.1	83.2	116.3
1971	54.2	884.7	98.2	121.3
1972	60.2	950.7	109.2	125.3
1973	57.4	923.8	107.4	133.1
1974	43.8	759.3	82.8	147.7
1975	45.7	802.4	86.1	161.2
1976	54.4	974.9	102.0	170.5
1977	53.6	894.6	98.2	181.5
1978	53.7	820.2	96.0	195.4
1979	58.3	844.4	103.0	217.4
1980	68.1	891.4	118.7	246.8
1981	74.0	932.9	128.0	272.4
1982	68.9	884.3	119.7	289.1
1983	92.6	1,190.3	160.4	298.4
1984	92.4	1,178.4	160.4	311.1
1985	108.0	1,328.2	186.8	322.2
1986	136.0	1,792.7	236.3	328.4
1987	161.7	2,275.9	286.8	340.4

SOURCE: *Economic Report of the President*, 1988.

TABLE A–17 Long-Term Bond Rates

Year	Moody's Aaa	30-Year Treasuries*	10-Year Treasuries
1950	2.62%		—
1951	2.86		—
1952	2.96		—
1953	3.20		2.85%
1954	2.90		2.40
1955	3.06		2.82
1956	3.36		3.18
1957	3.89		3.65
1958	3.79		3.32
1959	4.38		4.33
1960	4.41		4.12
1961	4.35		3.88
1962	4.33		3.95
1963	4.26		4.00
1964	4.40		4.19
1965	4.49		4.28
1966	5.13		4.92
1967	5.51		5.07
1968	6.18		5.65
1969	7.03		6.67
1970	8.04		7.35
1971	7.39		6.16
1972	7.21		6.21
1973	7.44		6.84
1974	8.57		7.56
1975	8.83		7.99
1976	8.43		7.61
1977	8.02	7.75%	7.42
1978	8.73	8.49	8.41
1979	9.63	9.29	9.44
1980	11.94	11.30	11.46
1981	14.17	13.44	13.91
1982	13.79	12.76	13.00
1983	12.04	11.18	11.10
1984	12.71	12.39	12.44
1985	11.37	10.79	10.62
1986	9.02	7.80	7.68
1987	9.38	8.59	8.39

*Data not available prior to 1977.

SOURCE: *Economic Report of the President*, 1988.

TABLE A–18 Treasury Bill Rates (3 months)

Year	*Nominal*	*Inflation Rate*	*Real*
1950	1.21%	.98%	.23%
1951	1.55	7.90	−6.35
1952	1.76	2.18	−.42
1953	1.93	.75	1.18
1954	.95	.49	.46
1955	1.75	−.37	2.12
1956	2.66	1.49	1.17
1957	3.26	3.56	−.30
1958	1.84	2.72	−.88
1959	3.40	.80	2.60
1960	2.92	1.60	1.32
1961	2.37	1.01	1.36
1962	2.77	1.12	1.65
1963	3.15	1.21	1.94
1964	3.54	1.31	2.23
1965	3.95	1.72	2.23
1966	4.88	2.85	2.03
1967	4.32	2.88	1.44
1968	5.33	4.20	1.13
1969	6.67	5.37	1.30
1970	6.45	5.91	.54
1971	4.34	4.29	.05
1972	4.07	3.29	.78
1973	7.04	6.22	.82
1974	7.88	10.96	−3.08
1975	5.83	9.10	−3.27
1976	4.99	5.76	−.77
1977	5.26	6.45	−1.19
1978	7.22	7.65	−.43
1979	10.04	11.25	−1.21
1980	11.50	13.52	−2.02
1981	14.03	10.30	3.73
1982	10.68	6.13	4.55
1983	8.63	3.21	5.42
1984	9.58	4.25	5.33
1985	7.48	3.56	3.92
1986	5.98	1.92	4.06
1987	5.82	3.65	2.17
Simple average			.94%
Geometric average			1.01%

SOURCE: *Economic Report of the President*, 1988.

APPENDIX B

Adjusting Liabilities to Common Interest Rates

A common problem in analyzing funding ratios across pension plans is that actuaries calculate liabilities based on different assumptions (most notably, different interest rates). For example, suppose two plans have an obligation to pay a single-life annuity of $1,000 for 15 years, but one actuary uses a discount rate of 10 percent per year, and the other uses 9 percent. Reported liabilities will be $7,760 and $8,230, respectively, even though both face the same obligation. For comparison, it is useful to evaluate all liabilities on the same basis.

In the above case, the adjustment factor is easy to determine. If both plans are to express liabilities based on a 9 percent interest rate, then the first plan's reported liabilities would be multiplied by a factor of 1.06 (=8,230/7,760). In general, however, it is difficult to determine exactly what the conversion factor should be. It depends on the level of the interest rate and the length of the annuity period. For example, in Table B–1, the above conversion is made for changes in the interest rates from 2 percent to 1 percent and 10 percent to 9 percent for annuity periods extending to 15 years, 30 years, and infinity. For the infinite annuity, a 100-basis-point conversion from a 2 percent to a 1 percent interest rate requires a conversion factor of 2, compared to 1.06 for the same 100-basis-point conversion for a 15-year annuity at the 10 percent interest rate level.

One obvious way to adjust liabilities in all plans is to ask actuaries for each plan to recalculate liabilities for a new common interest rate. This approach is feasible for a particular firm to test the sensitivity of its liabilities to interest rates. But for research purposes, usually the only data available are reported on the Form 5500 Annual Pension Plan Reports. These data include liabilities, assets, and assumed interest rates. The age distribution of participants is not reported, except insofar

TABLE B–1 Illustrative Interest Rate Conversion Factors

Period of Annuity	*Decrease in Interest Rate*	
	2 Percent to 1 Percent	*10 Percent to 9 Percent*
Infinity	2.000	1.110
30	1.149	1.091
15	1.074	1.060

as liabilities are separately reported for active participants and retirees. As suggested by the numbers in Table B–1, the liability adjustment is less sensitive for retirees because the discount period is shorter.

Actuarial Model

Algorithms are generated to convert liabilities to common interest rates in two ways. One way used by actuaries is to build a model plan with "typical" pension benefits and age and service distributions of active participants and retirees. Liabilities for participants in the model are generated for different interest rates. These relations form the basis for adjusting liabilities in a larger sample.

An example of this approach is presented in Table B–2, which summarizes the results of model simulations performed by Towers-Perrin as part of a study submitted to the PBGC in 1981. The model plan used in the study has average ages for active participants and retirees (weighted by liability levels) of 57 and 62, respectively. The results suggest that immediate liabilities (retirees) should be adjusted

TABLE B–2 Sensitivity of Liabilities to Interest Rates within Plans

Increase in Valuation Interest Rate		*Estimated Reduction in Value of Vested Benefits*	
From	*To*	*Immediate Annuities*	*Deferred Annuities*
4%	5%	7.8%	12.1%
5	6	7.4	11.7
6	7	7.0	11.2
7	8	6.6	10.8
8	9	6.3	10.4
9	10	5.9	10.1
10	11	5.6	9.8
11	12	5.3	9.5
12	13	5.1	9.2

SOURCE: Towers, Perrin, Forster & Crosby, Inc., *Forecasting of PBGC Liabilities under Terminated Pension Plans*, Final report submitted to the PBGC, September 1981.

TABLE B–3 Sensitivity of Liabilities to Interest Rates across Plans

Liabilities	*Coefficients*
Immediate (retirees)	−.077
Deferred (actives)	−.057
Number of plans	4,414

SOURCE: Richard A. Ippolito, *Pensions, Economics and Public Policy* (Homewood, Ill.: Dow Jones-Irwin, 1986), p. 65.

to a common interest rate using a factor that changes liabilities roughly 6 percent for each one percentage point change in the interest rate. The conversion factor for deferred annuities (active workers) is roughly 10 percent.

Cross-Section Estimation

If models to simulate interest rate changes are not available to researchers, another approach is to estimate the relation between liabilities and assumed interest rates using a cross-section of pension plans. An illustrative equation might be:

$$L(i)/PN = Ae^{bi} \qquad \text{(B–1)}$$

where

$L(i)$ = Liabilities evaluated at interest i
P = Average pension paid in the plan
N = Number of participants in the plan

If this relation is estimated over the sample of plans that use different interest rates in their calculations, an estimate of the parameter b can be obtained. The parameter b is an estimate of the percent change in liabilities affiliated with a change in the reported interest rate.

Results of one study that estimated such relationships using data from the 5500 forms (Schedule B, question 6) are shown in Table B–3. The results reveal adjustment factors for active and retiree liabilities in the ranges of 8 and 6 percent. These were the adjustment factors used throughout the text of the book. Thus, if active liabilities are reported as $100,000 at a 10 percent interest rate, the conversion to a 7 percent rate implies liabilities of $127,000 [equal to $e^{.08\times3.0} = 1.27 \times \$100{,}000$].

APPENDIX C

Factors that Affect PBGC Interest Rates

The method used by the PBGC to arrive at interest rates to discount liabilities is little understood. Its calculations are designed to replicate private-sector insurance prices, though the method used to attain this consistency sometimes generates misunderstanding from those who are not familiar with it.

This appendix is intended merely to illustrate some selected aspects of the PBGC interest rates to make them easier to compare to private-sector interest rate quotations. It is neither a description of the determination of PBGC interest rates nor a full explanation of why PBGC rates might be different than some private-sector insurance company interest rate quotations. A full-scale comparison of PBGC and private-sector rates would take into account other factors that might affect published quotations not mentioned here and would take us far beyond what is necessary.[1]

Instead, my intention is limited to illustrating (1) how the use of different mortality tables can generate correspondingly different interest rate quotations yet produce the same annuity purchase prices and (2) how different methods to set interest rates for deferred annuities can be consistent with the same market price quotations.

Immediate Annuity Rates

Prior to loading expenses, private insurance companies use discount rates presumably related to long-term bond rates (and other investments typically held by carriers). The PBGC immediate annuity rate

[1]These include the treatment of such factors as subsidized early retirement, administrative expenses, profit, and investment expenses.

tends to be lower than these rates. For example, in 1985 the PBGC immediate rate averaged approximately 9.75 percent; the average Moody's Aaa and 10-year Treasury bond rates were 11.37 and 10.62 percent, respectively. In 1977, the PBGC immediate rate was roughly 6.75 percent; the Moody's Aaa and 10-year Treasury rates were 8.02 and 7.42 percent, respectively.[2]

One reason this disparity exists is attributable to the mortality table used by the PBGC. This table generally assumes higher mortality than many tables currently referenced in private-sector annuity purchase rate quotations.

The PBGC starts with an estimate of private-sector annuity purchase prices. It then chooses an interest rate that, *when combined with the PBGC mortality table*, approximates the average private annuity purchase price. In this section, I will illustrate how the use of different mortality tables requires corresponding use of different interest rates to generate the same annuity purchase price.

Suppose, for example, that a private insurance firm assumes a 65-year-old will die with certainty at age 80. Based on long-term bond rates of, say, 7 percent and using continuous discounting, the price for an annuity for 65-year-olds is $9.29. If the PBGC used the same mortality assumption and did not reduce the interest rate to reflect administrative expenses, it also would quote a 7 percent immediate annuity rate. But instead, the PBGC uses an older mortality table; suppose this table assumes that all 65-year-olds die at age 79 instead of 80. Instead of updating its mortality table, the PBGC makes an offsetting adjustment in its choice of interest rates so as to generate the same net price as typical private sector insurance companies. The PBGC in this case would solve for some interest rate i that generates a price of $9.29; that is, if it used a continuous compounding model, it would search for the solution to the equation:

$$PVA\ (i;\ 65,79) = (1/-i)[e^{-i(79-65)}-1] = \$9.29 \qquad \text{(C–1)}$$

where $PVA(i;\ 65,79)$ denotes the present value of a one-dollar annuity from age 65 to 79 discounted at the interest rate i.

This equation is satisfied for the interest rate 6.325 percent. Thus, in this example, if the PBGC used a continuous compounding model, it would announce an immediate rate of 6.325 percent,[3] even though long-term bond rates and (pre-expense) private insurance company quotations are 7 percent. In practice, however, the PBGC rate is

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[2] *Economic Report of the President*, 1987, p. 324.

[3] In practice, the PBGC usually rounds its rates to the nearest .25 percent. The PBGC would also add its estimate of administrative expenses to the $9.29 before solving Equation (C–1).

calculated using a discrete interest rate formula and a mortality table (instead of certain death at a particular age).

Deferred Rates

The method used by the PBGC to choose deferred rates is also different than that used by most private-sector firms. In this section, I want to illustrate how different methods can generate the same deferred annuity purchase price.

When quoting immediate annuities for retirees, private insurers generally rely on prevailing long-term interest rates. The problem of matching bonds against liabilities is not large, and reinvestment risk is not prohibitive.

For progressively younger individuals, it becomes harder to exactly match assets against liabilities (it is harder to find assets with durations as long as liabilities), and reinvestment risk becomes large. To accommodate this uncertainty, private firms scale down interest rate assumptions for periods further in the future. Thus, if the 10-year-long term bond rate is 7 percent, an insurance company might quote 7 percent for the ensuing 10 years, 6.5 percent for the next 5 years, 6 percent for the 5 years beyond this, and so on. Thus, if a pension termination occurs in 1987, a private insurance firm might use an interest rate of 7 percent for all calculations to the year 1997, then use 6.5 percent for 1997 until 2002, 6 percent from 2002 until 2007, and so on.

For example, consider a two-person pension plan that pays 10-year annuities starting at age 65. Both individuals are certain to live for 10 years. The two individuals at termination are 65 and 60 years old. For the sake of the example, suppose a 7 percent interest rate applies to the period 1987 through 1997 for both individuals; a 4 percent rate is then applied from 1997 to 2002 (when the youngest retiree receives his last benefit). These rates are shown in the first two rows in Table C–1.

The PBGC bases its deferred rate structure to match private-sector prices. Though it sets a structure to match private-sector prices, it does so in a different way. In particular, consider the simple two-person example discussed above. If the annuity per year is one dollar, the private-sector rates for the deferred individual can be presented in the following way:

$$\begin{aligned} PV(\#2 \text{ private}) &= e^{-(65-60).07} PVA(.07;\ 65,70) \\ &\quad + e^{-(70-60).07} PVA(.04;\ 70,75) \\ &= 2.97 + 2.25 \\ &= \$5.22 \end{aligned} \qquad \text{(C–2)}$$

Individual #2's annuity for the first five years from age 65 to age 70 (1992–97) is discounted back to 1987 at 7 percent [first entry on the righthand side of Equation (C–2)]; his annuity from age 70 to age 75

TABLE C–1 Illustration: Deferred Interest Rates, Private versus PBGC

Individual	Age at Termination	Years		
		1987–1992	*1992–1997*	*1997–2002*
Private				
#1	65	7.00%	7.00%	—
#2	60	7.00	7.00	4.00%
PBGC				
#1	65	7.00	7.00	—
#2	60	6.40	7.00	7.00

Note: Example assumes 10-year annuity, age 65 to 75; death occurs after age 75.

(1997–2002) is discounted back to age 70 at 4 percent and then discounted back from 1997 to 1987 at 7 percent. The present value of this annuity is $5.22.

In this example, the PBGC would assign a deferred rate in a different way. Ignoring the mortality risk difference (there is a fixed 10-year annuity in the example, and death is certain not to occur prior to age 75), the PBGC also would choose the 7 percent rate as the immediate annuity rate. *Its method, however, would apply the immediate annuity rate to all present and future retirees during the period of retirement, regardless of when retirement occurred.* Thus, in terms of Table C–1, a 7 percent rate would be applied to the 65-year-old in payment status at the time of termination. For the 60-year-old, the same 7 percent rate would be used for his annuity period, from age 65 to age 75, but some lower rate would be used to discount the value of this annuity from age 65 to age 60. Using the method described below, this rate turns out to be 6.4 percent.[4]

This choice of rates is shown in the third and fourth rows of Table C–1. From 1997 to 2002, the PBGC discounts at a 7 percent rate, compared to 4 percent in the private sector. During the 1987–92 period, it applies a discount rate of 7 percent to individual #1 and 6.40 percent to individual #2. This structure of rates appears inconsistent with a typical investment model because it assumes the existence of different interest rates for different participants at the same point in time. But the rate levels are chosen to approximate private price quotations.

In particular, the deferred interest rate is chosen to satisfy the following equation:

$$\begin{aligned} PV(\#2, PBGC) &= e^{-(65-60).07}PVA(.07; 65,75) \\ &= \$5.22 \end{aligned} \qquad \text{(C–3)}$$

[4]Again ignoring the PBGC practices of (1) loading prices before solving for the interest rate and (2) rounding the resulting rates to the nearest .25 percent.

TABLE C–2 PBGC Interest Rates, 1974–1988

Year	Month*	Immediate Rate	Deferred Rates†		
			(1)	(2)	(3)
1974	September	8.00%	7.25%	5.75%	4.25%
1975	October	7.75	7.25	5.75	4.25
1976	January	8.00	7.25	5.25	4.00
	March	7.25	7.00	5.00	4.00
	June	7.25	6.75	4.75	3.50
	September	7.00	6.00	4.75	3.50
	December	7.00	6.25	4.75	3.75
1977	March	7.00	6.00	4.75	3.50
	June	6.75	6.25	4.50	3.75
	December	6.75	6.25	4.50	3.75
1978	March	7.00	6.25	4.75	3.75
	June	7.25	6.75	4.75	3.50
	September	7.25	6.75	4.75	3.50
1979	March	7.50	6.75	5.50	4.00
	June	7.50	6.75	5.50	4.00
	September	7.75	7.00	5.75	4.00
	December	8.50	7.75	6.50	4.00
1980	March	8.75	8.00	6.75	4.00
	June	8.75	8.00	6.75	4.00
	September	9.00	8.25	7.00	4.00
	December	9.25	8.50	7.25	4.00
1981	January	9.50	8.75	7.50	4.00
	February	9.75	9.00	7.75	4.00
	April	10.00	9.25	8.00	4.00
	June	10.25	9.50	8.25	4.00
	July	10.50	9.75	8.50	4.00
	August	10.25	9.50	8.25	4.00
	October	10.50	9.75	8.50	4.00
	November	10.75	10.00	8.75	4.00
	December	11.00	10.25	9.00	4.00
1982	January	10.50	9.75	8.50	4.00
	February	10.75	10.00	8.75	4.00
	March	11.00	10.25	9.00	4.00
	June	10.75	10.00	8.75	4.00
	August	11.00	10.25	9.00	4.00
	October	10.75	10.00	8.75	4.00
	November	10.50	9.75	8.50	4.00
	December	10.25	9.50	8.25	4.00
1983	January	10.00	9.25	8.00	4.00
	February	9.75	9.00	7.75	4.00
	April	9.50	8.75	7.50	4.00
	June	9.25	8.50	7.25	4.00
	September	9.50	8.75	7.50	4.00
1984	February	9.75	9.00	7.75	4.00
	March	9.50	8.75	7.50	4.00
	April	9.75	9.00	7.75	4.00
	May	10.00	9.25	8.00	4.00
	July	10.50	9.75	8.50	4.00
	August	10.75	10.00	8.75	4.00
	September	10.50	9.75	8.50	4.00
	November	10.25	9.50	8.25	4.00
	December	10.00	9.25	8.00	4.00

TABLE C–2 *(concluded)*

Year	Month*	Immediate Rate	Deferred Rates† (1)	(2)	(3)
1985	January	9.75	9.00	7.75	4.00
	March	9.50	8.75	7.50	4.00
	April	9.75	9.00	7.75	4.00
	May	10.00	9.25	8.00	4.00
	June	9.75	9.00	7.75	4.00
	July	9.25	8.50	7.25	4.00
	October	9.00	8.25	7.00	4.00
1986	January	8.75	8.00	6.75	4.00
	February	8.50	7.75	6.50	4.00
	April	8.00	7.25	6.00	4.00
	May	7.75	7.00	5.75	4.00
	October	7.50	6.75	5.50	4.00
	November	7.75	7.00	5.75	4.00
	December	7.50	6.75	5.50	4.00
1987	March	7.25	6.50	5.25	4.00
	June	7.50	6.75	5.50	4.00
	July	7.75	7.00	5.75	4.00
	October	8.00	7.25	6.00	4.00
	November	8.25	7.50	6.25	4.00
1988	March	8.00	7.25	6.00	4.00
	April	7.75	7.00	5.75	4.00
	June	8.00	7.25	6.00	4.00
	September	8.25	7.50	6.25	4.00
	November	7.75	7.00	5.75	4.00

Note: The method used by the PBGC to set immediate and deferred rates is provided in this appendix.

*All rates effective the first day of the month.

†Immediate rates are applied to all retirees in pay status. For participants within seven years of pay status, the first deferred rate is used; thus a worker seven years from pay status has his annuity discounted over his retirement period at the immediate rate, then discounted back seven years at the first deferred rate. Those between 7 and 15 years prior to pay status are discounted the incremental 8 years at the second deferred rate; and those further than 15 years from pay status are discounted over the incremental period at the third deferred rate. Prior to 1979, the length of the deferral periods were slightly different than these.

The solution to Equation (C–3) is approximately $i = 6.4$ percent.

The PBGC has established a fixed relationship between immediate and deferred rates. To do this, it presumably used methods similar to that shown in Equation (C–3) to determine the average relationship of deferred rates to the immediate rate. A fixed relationship between the immediate rate and deferred rates was found. The PBGC adopted a deferred rate for seven years prior to pay status 75 basis points below the immediate rate; the second eight years are discounted at 125 basis points below this number; and longer periods are discounted at a fixed 4 percent rate.

These relations were fixed so that tables of manageable size could be issued to actuaries and plan administrators who needed to perform these types of calculations. The book, entitled *Prospective and Actuarial Mortality Tables*, provides conversion rates for different ages and interest rate assumptions.

Table C–2 shows the history of immediate and deferred interest rates used by the PBGC from 1974 through 1988.

APPENDIX D

The Largest PBGC Claims

The purpose of this appendix is to briefly review the issues raised by the largest claims made against the PBGC. The circumstances surrounding these cases illustrate the essence of the so-called PBGC problem.

Introduction

Through the end of the 1986 fiscal year, approximately 1,000 companies had terminated over 1,300 single-employer pension plans, resulting in total net claims of almost $4 billion against the PBGC's single-employer termination insurance program. The 13 companies listed in Table D–1 account for roughly four fifths of this amount. The two most striking features of the table are that (1) 8 of the claims events were from the steel industry and (2) 11 occurred after 1981, which explains why the PBGC problem is relatively new. In addition, all of the companies in the table were in financial trouble at the time their pension plans terminated. All were in the process of renegotiating credit arrangements—11 were undergoing reorganization under the protection of the federal bankruptcy courts.

Generous Pension Amounts

The steel and automobile industry terminations, as a group, illustrate one of the central problems with PBGC insurance; namely, its guarantee of pension benefits is much more generous than the average benefits of PBGC premium payers. Instead of the normal retirement age of 62 or 65 with actuarial reductions for earlier retirement, the largest claims typically have "30-and-out" normal retirement ages, which means workers could retire with full (that is, unreduced) benefits after 30 years of service.

TABLE D–1 Largest PBGC Claims

Plan Sponsor	*Date of Termination*
Steel	
Alan Wood Steel	1978
Wisconsin Steel	1980
Phoenix Steel	1983
McLouth Steel	1983
Continental Steel	1986
Wheeling-Pittsburgh	1986
LTV Corporation	1986
Kaiser Steel	1987
Automobile/Trucks/Farm equipment	
White Motors	1982
White Farm	1982
Allis-Chalmers	1985
Other	
Rath Packing	1982
Braniff Airlines	1982

In addition, the steel industry plans for hourly workers included so-called shutdown benefits: the payment of unreduced pension benefits to older workers affected by a plant shutdown who otherwise did not qualify for full benefits. Usually a "rule of 65" applied: a 45-year-old worker with 20 years' service (the sum of 45 and 20 is 65) could immediately qualify for full benefits on a plant shutdown.

Instead of guaranteeing full benefits at, say, age 62 or age 65 and then providing actuarially reduced guarantees for earlier ages, the PBGC guarantees full benefits at earlier ages, including shutdown benefits.[1]

The potential magnitude of the guarantee of early retirement benefits became evident in the *Alan Wood Steel* termination in 1978, where over one fourth of the claim was attributable to such benefits. The problem grew in importance during the 1980s, culminating with the termination of three LTV plans in 1986, where almost 50 percent of the $2 billion claim was attributable to special early benefits.

Specific Attributes of Selected Large Terminations

Underfunding. Many of the large terminations highlight one or more fundamental defects of the pension insurance system. Through its short history, the PBGC has accepted hundreds of pension plans with

[1]These guarantees are limited to shutdown prior to plan termination and are subject to the maximum guaranteed benefits schedule (see Table 5–2). In addition, restrictions apply to benefits exceeding the single-life benefit annuity available at normal retirement age (see 29 CFR 2613.4).

low funding ratios. Table 7–2 in the text lists 35 PBGC claims—involving almost $1 billion in underfunding—that were less than 20 percent funded at termination. Some of the large terminations made it apparent why funding rules did not work well.

Waivers. Under ERISA, an employer is required to contribute an annual amount that will satisfy statutory funding requirements. Employers may, however, obtain funding waivers and thus defer contributions to the plan. Funding waivers were notable problems in two of the large termination cases: *Rath Packing and Continental Steel.*

When Rath terminated in 1982, five consecutive waivers to Rath's plans granted by the IRS were discovered. These waivers accounted for roughly half of the $60 million claim against the PBGC.

Interestingly, virtually the same pattern of waivers was found when Continental terminated in 1986. The IRS had also given this firm five consecutive waivers, yielding results virtually identical to Rath. Of Continental's roughly $60 million claim, approximately half was attributed to waivers.

Unpaid contributions. Employers are required to continue to fund a pension plan up to the date of termination. However, when financial problems become acute, employers often defer contributions; then, if the plan terminates, the plan has large amounts due and unpaid contributions. For example, when the *LTV Corporation* plans were terminated in 1986, the plan sponsor had not made its required contributions for the 1985 plan year.[2] A study of large terminations also showed a pattern of plan sponsors failing to pay required minimum contributions prior to termination. A 1986 GAO study of the largest terminations between 1980 and 1983 showed that almost 25 percent of claims were attributable to unpaid contributions (see Table 7–11).

Lump sums. The most notable characteristic of the *LTV Republic Steel* plan for salaried employees was its unrestricted payment of lump sums to participants eligible for normal or early retirement. During the period prior to termination, a large portion of those eligible chose lump sums. This created two problems: (1) the lump-sum procedure resulted in the use of assets to pay a significant amount of nonguaranteed benefits; and (2) few assets were left to pay ongoing benefit amounts to retirees in the plan.

Due in large part to these lump-sum payments, the plan was underfunded at termination by $230 million and had available assets of only $7,700 with which to pay more than $2 million in monthly benefits to retirees. The Republic Steel plan had been in compliance

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[2]LTV had obtained waivers from the IRS for contributions required in the 1984 plan year; these waivers were secured by a pledge of common stock in LTV Aerospace.

with the minimum funding standards and had received no minimum funding waivers.

Minimum funding standard. Perhaps the best example of the inadequacy of ERISA funding standards was found in the termination of the *Allis-Chalmers* plans in 1986. One of the terminated plans had underfunding of $170 million and had enough assets to pay only one month of benefit payments. Yet Allis-Chalmers had made all required contributions to the plan and had no minimum funding waivers. This situation developed because the 30-year amortization rules for past service liability were too long for a plan with large underfunding that was dominated by retirees (see Chapter 7).

Transferring exposure to financially troubled firms. Another problem area that surfaced after ERISA was the large potential exposure for the PBGC if viable employers could shift poorly funded plans to weak employers. In the event of a subsequent termination, if only the weak employer was liable, the PBGC would have a large claim and the predecessor employer would have effectively shifted the liability to the PBGC.

The *Wisconsin Steel* termination illustrates this problem. Wisconsin Steel had been a part of International Harvester (now Navistar International) for 75 years until it was sold in 1977 in a leveraged transaction to a financially weak subsidiary of Envirodyne Industries, a small consulting company. However, Wisconsin Steel continued to be involved in certain aspects of the administration of the plan. The bankruptcy of Wisconsin Steel followed in 1980. The PBGC contended that a company cannot escape financial responsibility for its pension plans by transferring them to a weak third party that cannot successfully continue the business or fund the pension plans. This case remained in litigation in the fall of 1988.

Follow-on plans. When a plan is terminated with insufficient assets and the PBGC must pay guaranteed benefits, the PBGC has opposed the employer's establishing certain kinds of follow-on plans, and in particular, plans, which when added to the benefits provided by the PBGC, provide participants with benefits substantially equal to those that would have been provided by the terminated plan if it had continued. In effect, establishment of a follow-on plan allows an employer to shift to the PBGC a substantial portion of the cost of funding an ongoing pension plan for its employees.

In August 1986, *Wheeling-Pittsburgh* and the union submitted follow-on plans to the PBGC for its approval. In December 1986, the PBGC disapproved the proposed follow-on plans on the basis that such plans constituted a de facto continuation of the terminated plans. On February 9, 1987, Wheeling-Pittsburgh and the union filed suit in district court, seeking an order allowing them to establish the proposed

follow-on plans and denying the PBGC authority to restore the assets and liabilities of the terminated plans on the establishment of such follow-on plans. The case was pending as of the fall of 1988.

The proposed follow-on plans of Wheeling-Pittsburgh consist of two components: one new plan covering active employees and a supplemental plan covering both active employees and retirees. The proposed supplemental plan is designed to provide retirees with 95 percent of the difference between the benefits they would have received under the terminated plan and the benefits guaranteed by the PBGC.

Size of termination. *LTV Corporation* entered Chapter 11 bankruptcy proceedings in 1986. The PBGC terminated four of its pension plans in late 1986 and early 1987. This event raised many issues for the PBGC, but perhaps none were more important than the sheer size of the claim. This single claim doubled the PBGC deficit from approximately $2 billion to almost $4 billion.

Historically, several large impending claims were facing the PBGC (notably, Chrysler Corporation and International Harvester), but none actually occurred. All of the premium requests made to Congress assumed "large" claims would not be made. The LTV termination essentially forced policymakers to face the reality that potential exposure to the PBGC was many billions of dollars higher than previously realized. This realization was perhaps the most important stimulus to enactment of the Pension Protection Act of 1987. It also intensified the issue of follow-on plans and the notion of restoration.

In June 1987, LTV and its union agreed to the collective bargaining agreement that included a follow-on plan for hourly workers. A similar follow-on plan was formulated for salaried employees. On July 30, 1987, the bankruptcy court approved the follow-on plans over the PBGC's objection.

The PBGC restored three of the LTV plans to their pretermination status on September 22, 1987. The bases for the PBGC's decision to restore were

1. The abuse of the termination insurance program caused by LTV's establishment of follow-on plans that, along with the PBGC's guaranteed benefits payments, essentially continued the terminated plans.
2. The improvement in LTV's and LTV/Steel's financial conditions.
3. The demonstrated willingness of LTV Steel to fund retirement programs.

LTV opposed the restoration, and the dispute was the subject of a district court case—*Chateaugay Corporation, Reomar, Inc., LTV Cor-*

poration, et al. Among other rulings, the district court found insufficient evidence that the follow-on plans were so abusive of the insurance system so as to justify restoration. As of fall 1988, the case had been appealed by the PBGC in the U.S. Court of Appeals for the Second Circuit.

APPENDIX E

Summary of Major Pension Protection Act Provisions Affecting Single Employer Plans

	Old Law	Pension Protection Act		
		PPA Section	*ERISA Section*	*Provision*
A. Single-employer premium				
1. Per cap ccharge	$8.50 per participant	9331(a)	4006(a)(3)(A)	$16 per participant
2. Additional premium	No provision	9331(b)	4006(a)(3)(E)	$6/$1,000 (or fraction thereof) of unfunded vested benefits as of close of preceding plan year.*
a. Maximum additional premium	No provision	9331(b)	4006(a)(3)(E)	$34/participant, less $3 for each of the 5 plan years beginning before 1988 for which contributions were the maximum deductible under IRC Sec. 404. Reduction of maximum funding charge applies for 5 plan years.
3. Liability for premiums	Plan administrator	9331(c)(2)	4007(a)	Plan administrator or joint and several liability for contributing sponsor and members of its controlled group.
4. Effective date		9331(f)		Plan years beginning on or after 1/1/88.
5. Deposit of premiums in new revolving fund	Deposited in basic benefits revolving fund	9331(d)	4005(f)	Premium in excess of $8.50 per participant, and interest and penalty thereon, to be deposited in a separate revolving fund. Fund may not be used to pay administrative costs or benefits under plans terminated before 10/1/88, unless no other amounts are available. The fund may be invested in any obligations that the PBGC considers appropriate.
B. Minimum funding standards—payment of contributions				
1. Due date for contributions	2½ months after plan year and 6-month extension	9304(a)	302(c)(10)(A)	8½ months after plan year. Effective: Plan years beginning on or after 1/1/88.

2.	Quarterly estimated contribution	None	9304(b)	302(e)	Requires quarterly installments equal to "applicable percent" of lesser of 90% of required annual payment for the current plan year or 100% of required annual payment for the preceding plan year. (Rules for short plan years under regulation of the Secretary of the Treasury.) Applicable percent for plan year beginning: 1989 6.25 1990 12.50 1991 18.75 1992 & on 25.00 First installment is due 4/15/89 for calendar-year plans. Special rule for unpredictable contingent event benefits.†
3.	Interest on late payments	Interest rate consistent with rate used to compute plan costs	9304(b)	302(e)	Greater of old law interest rate or 175% of the federal midterm rate in effect under IRC Sec. 1274 for the first month of the plan year. Interest runs until payment is made. Payments are credited first to the oldest outstanding contributions. Effective: Plan years beginning after 1988.
4.	Excise tax on late contributions	Initial rate 5%	9304(c)	IRC 4971(a)	Initial rate 10%. Effective: Plan years beginning after 1988.
5.	Notice of failure to make a required contribution payment	No provision	9304(d)	101(d)	Employer must notify participants, beneficiaries, and alternate payees within 60 days after a missed payment or denial of a funding waiver request. Notice need not be given while waiver request is pending or if waiver is granted. Effective:Date of enactment.

	Old Law	Pension Protection Act		
		PPA Section	ERISA Section	Provision
6. Liability for contributions and excise tax for unpaid contributions	Contributing sponsor	9305	302(c)(11) IRC 4971(e)	Contributing sponsor and controlled group members are jointly and severally liable. Effective: Plan years beginning after 1987.
C. Minimum funding standards—amount of required contributions				
7. Amortization periods				
a. Experience gains and losses	15 years	9307(a)	302(b)(2)(B)(iv) and 3(B)(ii)	5 years—Effective: Plan years beginning after 1987.
b. Waived funding deficiencies	15 years	9307(a)	302(b)(2)(C)	5 years—Effective: Plan years beginning after 1987.
c. Gains and losses due to changes in actuarial assumptions	30 years	9307(a)	302(b)(2)(B)(v) and (3)(B)(iii)	10 years—Effective: Plan years beginning after 1987.
8. Reasonability test for actuarial assumptions	Must be reasonable in the aggregate and in combination offer the actuary's best estimate of anticipated experience under the plan	9307(b)	302(c)(3)	Each assumption must be individually reasonable (in view of the experience of the plan and reasonable expectations) or, in the aggregate, assumptions must result in a contribution equivalent to that which would be determined if each assumption and method were reasonable. Effective: Plan years beginning after 1987.

9. Additional contribution for underfunded plans	No provision	9303	302(d)	(1) Excess of "deficit reduction contribution" over the sum of the charges to the funding standard account (excluding amortization of net experience losses and losses due to changes in actuarial assumptions), reduced by credits for amortization of decreases in unfunded liability, due to amendments and (2) "unpredictable contingent event amount" for events that occur after October 17, 1987. Additional contribution shall not exceed the amount needed to reach 100%-funded current liability percentage. See Notes for definitions of terms.
a. Small-plan exceptions				Plans with 100 or fewer participants are exempt. Plans with 101–150 participants. Additional contribution is amount for larger plans × .02 × highest number of participants above 100. All defined benefit plans of controlled group to be treated as a single plan.
b. Effective date				Effective: Plan years beginning after 1988.
c. Steel transition rule for plan years beginning before 1994.				Additional contribution is limited to the sum of: (1) a 1% per year increase in the funded current liability percentage excluding unpredictable contingent event liability and (2) 10-year amortization of unpredictable contingent event liability for events that occur after 12/17/87.
10. Limitations on amount of deductible contributions for a plan year				

	Old Law	Pension Protection Act		
		PPA Section	ERISA Section	Provision
a. Full funding limitation‡	Deduction for a plan year is limited to the excess of the accrued liability (including normal cost) over the lesser of the actuarial value or the fair market value of plan assets	9301	302(c)(7)	Deduction for a plan year is limited to the excess of the lesser of: (1) 150% of current liability or (2) accrued liability (including normal cost) over the lesser of the actuarial value or the fair market value of plan assets. (Note: Accrued liability often includes benefits projected to normal retirement age. Current liability includes only benefits accrued through the end of the plan year.)
b. Limitation on amortization of past service credits used to determine limitation on deduction	Limitation refers to amortization of past service and supplementary credits	9307(d)	IRC 404(a)(1)(A)(iii)	Limitation refers to amortization of the unfunded cost attributable to past service and supplementary credits.
c. Unfunded current liability is deductible	Full funding and other limitations on deductible amounts may preclude deduction of amounts equal to unfunded current liability	9307(c)	IRC 404(a)(1)(D)	Maximum deductible amount shall not be less than unfunded current liability under IRC Sec. 412(1) (computed without reducing assets by the credit balance in the funding standard account). Rule applies only to plans with more than 100 participants. All plans of the same controlled group are aggregated for purposes of this rule. Effective: Plan years beginning after 1987.

11. Limitation on interest rate for determining current liability and additional contributions	Must meet the reasonable-in-the-aggregate test together with other assumptions. Must be consistent with the rate used to determine costs	9307(e)	302(b)(5)	(1) Must be within "permissible range" of 10% above or below weighted average of 30-year Treasuries for the 4 years preceding the plan year. (2) Must be determined without regard to plan experience or reasonable expectations but consistent with annuity purchase rates to provide plan liabilities. (3) If Secretary of Treasury finds that lowest end of permissible range is too high, Secretary may lower the rate but not below 80% of the average of the range before the rate is lowered.
D. Funding waivers				
1. Due date for waiver applications	No provision	9306(a)	303(d)	2½ months after close of plan year. Effective: Plan years beginning after 1987. Transition rule for plan year beginning in 1988: 5½ months after close of plan year.
2. Hardship criterion for funding waiver	Substantial business hardship of contributing sponsor	9306(a)	303(a),(b) and (d)	Entire controlled group (viewed as a single employer) must be suffering *temporary* hardship. Effective: Waiver applications submitted after 12/17/87
3. Frequency of waivers	5 in 15 consecutive years	9306(b)	303(a)	3 in 15 consecutive years. Waivers for plan years beginning before 1/1/88 are disregarded. Effective: Waiver applications submitted after 12/17/87.
4. Interest on waived contributions and extensions of amortization periods	Rate for late taxes	9306(c)	303(a) and 304(a)	Greater of: (1) 150% of the federal midterm rate under IRC Sec. 1274 for the first month of the plan year or (2) the interest rate used to determine plan costs. Effective: Applications submitted after 12/17/87.

	Old Law	Pension Protection Act		
		PPA Section	*ERISA Section*	*Provision*
5. Notice of waiver application	No provision	9306(d)	303(e)(1)	Notice must be given to the plan, participants, beneficiaries, alternate payees, and union. Notice must state extent to which guaranteed benefits and benefit liabilities are funded. Effective: Waiver applications submitted more than 90 days after date of enactment.
E. Lien for unpaid, unwaived contributions				
1. Plans affected	None	9304(e)	302(f)	Lien may arise only if aggregate unpaid contributions (with interest) exceed $1 million and unfunded current liability percentage is less than 100%.
2. Amount of lien	None	9304(e)	302(f)	Lesser of: (1) aggregate outstanding unpaid amounts (with interest), less $1 million or (2) aggregate unpaid amounts outstanding for plan years beginning after 1987 (with interest).
3. Period of lien	None	9304(e)	302(f)	Lien runs from the 60th day after payment was due to the end of the plan year in which payment is made.
4. Nature of lien	None	9304(e)	302(f)	Statutory lien in favor of the plan on all real and personal property of the contributing sponsor and controlled group. Amount underlying the lien shall be treated as a tax due and owing the United States. Rules similar to ERISA Sec. 4068 (c)–(e) (employer liability lien) shall apply to lien and underlying amount.

	5. Notice to PBGC of missed contribution	Reportable event by plan administrator under 4043	9304(e)	302(f)	Person failing to make a required payment for which a lien arises must notify the PBGC within 10 days of the due date.
	6. Enforcement	None	9304(e)	302(f)	Lien may be perfected and enforced only by the PBGC or by a contributing sponsor or controlled group member at the PBGC's direction.
	7. Effective date	None	9304(e)		Plan years beginning after 1987.
F.	**Security for new underfunding**				
	1. Benefit increases subject to security requirement	No provision	9341	307	Security required if abenefit increase will bring ratio of assets to current liability below 60%. Plan loses qualification if security is not provided.
	2. Amount of security		9341	307	The excess of the lesser of: (1) amount needed to increase funded ratio to 60% or (2) the increase in current liability due to the benefit increase amendment, over $10 million.
	3. Form of security		9341	307	Surety bond, escrowed cash or short-term Treasuries, or other security satisfactory to Treasury and involved parties.
	4. Release of security		9341	307	Security is released at the end of the plan year after security is provided and funded current liability percentage is at least 60%. Secretary of Treasury may allow partial releases based on improvements in funded current liability percentage.
	5. Effective date		9341		Security rules apply to amendments made after enactment of Pension Protection Act excluding amendments made under collective bargaining agreements ratified before enactment.

	Old Law	Pension Protection Act		
		PPA Section	ERISA Section	Provision
G. Standard terminations				
1. Sufficiency criterion	Assets sufficient to distribute benefit commitments	9313(a)	4041(b)	Assets sufficient to distribute benefit liabilities.
2. Enrolled actuary certifications for insured plans described in IRC Sec. 412(i) (plans fully funded by paid-up insurance contracts)	Required	9314(a)	4041(b)(2)(A)	Requirement eliminated.
H. Limitations on reversions of excess assets from terminated plans				
1. Waiting period before effective date of an amendment permitting reversion to contributing sponsor or controlled group member	No provision	9311(a)	4044(d)(2)	5-year waiting period unless plan is less than 5 years old and has provided for reversion since inception. 5-year waiting period also applies to assets transferred to another plan. Effective: Reversion provisions adopted after 12/17/87. (Exceptions: for existing plans silent on ownership of reversions, a one-year period was granted during which these plans could amend plan to make provisions for reversion ownership without triggering the new five-year rule.)

2. Formula for excess assets derived from mandatory employee contributions	No provision. The PBGC has issued regulations that include a presumptive formula and require PBGC approval of other formulas.	9311(b)	4044(d)(3)	Excess attributable to mandatory contributions is determined by ratio of mandatory employee contributions (plus such amounts paid out in lump sums and annuity purchases of entire nonforfeitable benefits in the 3 years before termination) to total benefit values. Effective: Notices of intent to terminate filed and termination proceedings initiated by the PBGC after 12/17/87.
I. Distress termination				
1. Controlled group members that must meet a distress test	Contributing sponsors and substantial controlled group members	9313(b)	4041(c)(2)(B)	Contributing sponsors and all controlled group members.
2. Bankruptcy reorganization distress test	Must enter reorganization before termination date and bankruptcy court approves termination	9313(b)	4041(c)(2)(B)	Must enter reorganization before proposed termination date. Bankruptcy court must approve the termination and find it necessary for the company to pay its debts and stay in business outside of reorganization.§
3. Submit to the PBGC a copy of request of court approval of termination	No provision	9313(b)(5)	4041(c)(2)(B)	Copy of request of court approval of termination must be filed with the PBGC.
4. Effective date				Notices of intent to terminate filed after 12/17/87.
5. Enrolled actuary certifications for insured plans described in IRC Sec. 412(i) (plans fully funded by paid-up insurance contracts)	Required	9314(a)	4041(c)(2)(A)	Requirement eliminated.

	Old Law	Pension Protection Act		
		PPA Section	*ERISA Section*	*Provision*
J. Section 4049 trust				
1. Liability above guarantees	Lesser of 75% of outstanding benefit commitments or 15% of total benefit commitments	9312(b)(2)	4062(b)(1)(A)	100% of unfunded benefit liabilities as of termination date, plus interest.
2. Collection of liability above guarantees	Sec. 4049 trust	9312(b)(2)	4062(b)(1)(A) 4068(a)	4049 trust is eliminated. The PBGC is responsible for collecting the entire unfunded benefit liabilities. The PBGC's tax-status claim/lien remains at 30% of controlled group net worth.
3. Determination of amounts payable to participants in excess of guaranteed and funded nonguaranteed benefits	Amounts collected by Sec. 4049 trust are distributed annually to participants based on outstanding benefit commitments	9312(b)(3)	4022(c)	The PBGC shall allocate to participants in accordance with Sec. 4044(a) benefit priorities, the product of the outstanding benefit liabilities and the "recovery ratio."¶
4. Effective date		9312(d)(1)		Notices of intent to terminate filed or termination proceedings instituted by the PBGC after 12/17/87. Transitional rule. For notices of intent to terminate filed before 12/17/90, the recovery ratio is determined based on plan data and not on historical data, provided the recovery ratio can be calculated on plan data by 12/17/90.
5. Sec. 4049 trust expenses for prior terminations	Cannot be paid until Sec. 4049 trust collects enough assets to cover them	9312(d)(2)	4049(a)	Contributing sponsor and controlled group responsible for reasonable administrative expenses of Sec. 4049 trust before collections by the trust and employer liability will be reduced accordingly.

*Unfunded vested benefits means unfunded current liability under Sec. 302(d)(8)(A), taking into account vested benefits only and valuing vested benefits using an interest rate equal to 80 percent of the annual yield on 30-year Treasury securities for the month preceding the month in which the plan year begins.

†Unpredictable contingent event benefits are disregarded in computing the required annual payment. However, the required quarterly installment is increased by the greater of (1) the amount of such benefits paid during the three months preceding the month in which the installment is due (including the cost of annuities purchased and lump sums paid) or (2) 25 percent of the charge for the plan year for amortizing over seven years the benefit liability for unpredictable contingent events, with amortization beginning in the plan year in which the event occurs.

‡Secretary of Treasury required to study effect of change in full funding limitation on benefit security and report results to the Ways and Means and Finance Committees by 8/15/88. (NOTE: As of fall 1988, this study had not been completed.)

§The liquidation distress test also tightened to require commencement of proceeding before proposed termination date.

¶Benefit liabilities means the benefits of employees and their beneficiaries under the plans [within the meaning of IRC Sec. 401(a)(2)].

Outstanding amount of benefit liabilities means the value of benefit liabilities [under assumptions prescribed by the PBGC for purposes of Sec. 4044] minus the value of such liabilities funded by plan assets or guaranteed by the PBGC.

The recovery ratio is the ratio of the values of the PBGC's recovery under 4062–4064, as applicable, to unfunded benefit liabilities. If outstanding benefit liabilities exceed $20 million, the recovery ratio is based on plan data. In smaller cases, an average of prior terminations after 12/17/87 is used. The PBGC's calculations are binding unless shown by clear and convincing evidence to be unreasonable.

Definitions of terms

Deficit reduction contribution means the sum of the unfunded old liability amount and the unfunded new liability amount.

Unfunded old liability amount is the amount needed to amortize in equal annual installments over 18 years unfunded current liability in the plan at the start of the first plan year beginning after 12/31/87.

Unfunded new liability amount is the product of the applicable percentage and the unfunded current liability determined without regard to (1) unamortized unfunded old liability and (2) liability related to unpredictable contingent event benefits (whether or not the event has occurred).

The *applicable percentage* is .30 − [.25 × (Funded current liability percentage − .35)] or .3, whichever is lower.

Current liability means all liabilities to employees and beneficiaries. The rate of interest used to determine current liability is restricted (see item C.11 of this summary). Unpredictable contingent event benefits are not taken into account until the event occurs. *Conference Report* states that current liability is determined on a termination basis.

Unfunded current liability means the excess of (1) current liability over (2) plan assets, reduced by any credit balance in the funding standard account.

Definitions of terms (*concluded*)

Unpredictable contingent event amount means the greater of:

(1) the applicable percentage of (1-Funded current liability percentage) × Unpredictable contingent event benefits paid during the plan year

Plan years beginning in:	*Applicable percentage*
1989 and 1990	5%
1991	10
1992	15
1993	20
1994–2001	Increases 10 percentage points a year, reaching 100% in 2001 and remaining at 100% thereafter

or

(2) the amount needed to amortize in equal annual installments over seven years the unpredictable contingent event benefit liabilities, beginning with the plan year in which the event occurs.

Unpredictable contingent event benefit means a benefit contingent on an event other than age, service, compensation, death, disability, or an event that is reasonably and reliably predictable as determined by the Secretary of the Treasury.

Funded current liability percentage means the ratio of plan assets to current liability. Assets are valued under any reasonable actuarial method that takes into account fair market value and is permitted by regulations of the Secretary of the Treasury. Current liability is determined using the rate of interest for determining required contributions [IRC 412(b)(5) rate of interest].

APPENDIX F

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Dissenting Comments

Statement of Howard Young

This book contains a wealth of data about PBGC experience. However, it does not provide a complete or balanced presentation of the development or operation of the program. Instead, the analysis is shaped by the author's desire to develop a private-market approach to the issue. While that may be an interesting academic exercise, readers should consider the following questions.

First, is it a utilitarian approach? Major efforts were made prior, and subsequent, to the enactment of ERISA (which established the PBGC) to encourage the development of such private-market insurance. None of that activity is discussed in the book. No significant entities were willing to underwrite the risk, and there still isn't any indication that insurers would be available.

Second, would the resulting private-market insurance be more acceptable to plan sponsors than the present system? For example, the proposal in Chapter 10 includes a requirement that the insurer be the plan administrator. That seems more onerous than many of the regulatory provisions that plan sponsors have opposed. (The "private" nature of the insurer shouldn't make much difference—federal or state regulators regularly intervene in insurers' operations.) Also, the vast majority of plan sponsors (and participants) bear PBGC annual premiums below $35 per participant under the new law (see Table 6–9). How many of them would be willing to pay the $240 lump-sum transition charge, in addition to ongoing premiums, as suggested at the very end of Chapter 10?

Third, would the private-market insurance meet the protection goals that stimulated enactment of ERISA and the PBGC? Throughout the book, there is an emphasis on real cuts in protection against loss of benefits. If such arrangements had applied during the severe dislocations of the U.S. economy in the 1970s and 80s, even greater hardships would have occurred, and it is likely that support for the

existing pension system would be much weaker. Dissatisfaction with the system as it then existed produced ERISA/PBGC; an unsatisfactory private-market arrangement would invite additional legislation.

In the absence of positive answers to those three questions, there is little justification for expecting the public program to mimic the supposed characteristics of a nonimplementable private-market approach. Public and private programs each have interrelated strengths and weaknesses, which ought to be considered in their own context rather than on the basis of an ideal standard.

Certainly the PBGC encountered difficulties, and abuses have occurred; but those arose from the objections and obstacles raised by the program's opponents as well as from the overly optimistic good intentions of its supporters. For example, at a very early date, the supporters made proposals (such as changes in the bankruptcy laws) that would have produced a sounder program. Additional problems need to be overcome, but there should also be recognition of its public-program advantages, such as the ability to allocate costs across firms in our interdependent economy.

Students interested in improving protection against benefit loss should focus on how to develop a more effective public program rather than use private-market concepts as a justification for reducing benefits of participants in plans where no abuse has occurred.

Statement of Michael S. Gordon

The Economics of Pension Insurance, by Richard A. Ippolito, contains so much that is valuable and well reasoned (and, incidentally, with which the undersigned agrees) that it is painful to point out that the book is significantly flawed, if not disfigured, by the author's unwillingness to confront—except by innuendo and disparagement—the politics of pension insurance. Indeed, although the author explicitly or implicitly indicts Congress or prior regimes at the PBGC for their collective willingness to open loopholes or their failure to close them—all at the expense of what the author perceives, often correctly, as sound insurance principles—he either is not aware of, or overlooks, innumerable efforts both in the drafting stages of ERISA and thereafter to structure the law on some of the very principles he advocates.

To give just a few examples: he does not acknowledge that the early precursors of Title IV confined the insurable event to "distress" terminations, nor does he seek to inquire as to why that approach was subsequently abandoned. He seems unaware of, or oblivious to, the fact that (1) the Senate Labor and Public Welfare Committee reported Title IV provisions making an employer liable up to 50 percent of his net worth (some members of the committee would have preferred 100 percent), (2) the Senate Finance Committee insisted under organized business pressure that net worth liability be restricted to 10 percent (the bulk of that committee would have preferred no employer liability whatsoever), and (3) 30 percent was a last-ditch compromise preventing a Senate floor fight that would have unglued the entire legislation.

He also neglects to note that the original premium formula in the bills of both Senate and House labor committees was tied to the PBGC's exposure (i.e., to the degree of unfunded vested liabilities) and that even after the *per capita* premium tax method was adopted, the law still authorized the PBGC to prescribe exposure-related premiums,

subject to congressional ratification. The PBGC never seriously sought to exercise that authority until 1987. Moreover, there is no mention that (1) all the original ERISA bills adopted Professor McGill's recommendation and prohibited insurance coverage with respect to plan amendments occurring within five years of plan termination and (2) the original Williams-Javits bill precluded insurance coverage for unfunded vested liabilities accrued before the bill's enactment (which goes a long way toward explaining why, as a matter of legislative design, a 30-year amortization funding period was considered adequate).

Finally, and most significantly in terms of the author's heavy reliance on a private insurance model to guide his analysis, there is no mention that, as enacted, ERISA authorized the creation of private insurance for the 30 percent net worth liability exposure—so-called contingent employer liability insurance (CELI)—which was exhaustively studied by the PBGC, found unworkable, and, on the basis of recommendations made by the PBGC, repealed in 1980 as part of the multiemployer plan amendments to ERISA (MEPPAA). The failure to touch on CELI's demise is inexplicable.

This is not the place to indicate in detail the nature of the political value judgments that influenced the adoption of departures from what otherwise might be regarded as sound insurance principles. Suffice it to say that free market criteria, which Ippolito extols as the highest good, were not then, and may not be even now, controlling. In the first chapter, Ippolito announces—somewhat snidely, in my opinion—that "PBGC can be viewed as the embodiment of a national research project," that he will assume that "Congress intended to erect a bona fide pension insurance firm," and that for purposes of writing his book he has rejected the possibility that "a pricing and insurance contract could have been enacted in 1974, but was not because of deliberate attempts to effect transfers to workers and shareholders in troubled firms."

Of course, what the author rejects happens to be the only authentic explanation for what occurred in 1974. Lest we forget, this was the era of the Chrysler and Lockheed bailouts. The supposition that Congress was prepared to accept loss of jobs and further industrial decline in return for sound insurance principles is preposterous and is why, even today, there will be stiff resistance to redesigning pension insurance along the lines he proposes.

Ippolito seems to regard the political value judgments that led to the subordination of sound insurance principles as distasteful, irrational, or even immoral. Not so. Legislative policy (and even economic policy) vis-à-vis private pensions cannot be judged primarily by free market criteria or the competitive impact on those affected by it, but rather by political standards. What might appear on the surface to be

only a technical question involving PBGC design may be in reality another example of the ceaseless struggle to maintain the economic strength of the greatest democracy in the world and the major defender of freedom everywhere. This being the case, the national interest requires close attention and action with respect to declining industries, which is, after all, the real problem underlying pension insurance. The obsession with free market criteria—while it may serve as a useful corrective to inappropriate, politically based proposals—should not distract us from the essential political task—to reconcile the need to arrest this nation's precipitous industrial deterioration with the further redesign of Title IV along more solid insurance principles.

All of this suggests to me that the incremental approach to Title IV amendments will continue. In this respect, Ippolito has much to say that is of great importance, and no one, with the possible exception of Professor McGill, has said it better. Rather than catalog here all the specific areas of my agreements and disagreements, let me close by noting my judgment that overall, the most fruitful areas to explore for the next administration would be the concept of a risk-related premium and its collateral aspects, and revision of the latest overkill funding rules created by the Pension Protection Act of 1987. I should add that in this last respect, the PBGC cannot escape responsibility for a miserable legislative strategy that virtually invited a tax committee ambush. Let us hope that next time—if there is a next time—more attention will be paid to the nuances of the legislative process and less attention to scoring ideological points.

Index