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Introduction. This paper synthesizes findings of a recently published EBRI report on retirement, program coverage and benefit entitlement.^{1/} The analysis focuses on explanations of current coverage and participation in pension plans, the historical growth of such plans, and recent forecasts of future private pension coverage.

The President's Commission on Pension Policy appointed by President Carter issued its final report^{2/} in January 1981. Because their report focused on some of these issues, a portion of their work is reviewed in the EBRI study. The Pension Commission concluded that: "Commission forecasting models indicate that the proportion of the labor force covered and vested in employee pension plans is not expected to increase significantly under current policies."^{3/} They concluded that pension growth was stagnating and that this condition would persist for the foreseeable future. Based on this conclusion, the Commission recommended the creation of a national mandatory pension system. Before discussing the Commission's analyses which underlie their final conclusions, this paper will explore whether alternative conclusions might be reasonable.

Since benefit levels in most employer pension programs are based on an employee's years of service and earnings, employer pensions cannot provide meaningful retirement income to all workers. Therefore, in assessing the effectiveness of employee pension coverage, a relevant workforce must be defined. The EBRI report defines the relevant workforce as nonagricultural, paid employees, over age 25, who have been in current employment more than one year, and who work more than 1,000 hours annually.

The 25/1/1,000 criteria are used because in developing the 1974 Employee Retirement Income Security Act (ERISA), the Congress determined that these were reasonable requirements for employee pension program participation eligibility. Also excluded from the "relevant workforce" are self-employed and agricultural workers. The self-employed are excluded because: (1) generally these individuals are the most qualified to decide whether they should invest their savings in outside retirement income programs or in their own companies; (2) the long-term self-employed frequently accumulate business assets that provide substantial retirement security. It is documented that those who establish successful businesses are among society's most wealthy individuals.^{4/}

Agricultural workers are excluded from the relevant workforce because farmwork is seasonal and very few hired agricultural

workers ever satisfy ERISA's 1,000-hours, one-year employment criteria. In 1979, 71 percent of the 2.6 million hired agricultural employees worked fewer than 150 days in any one job; 59 percent worked fewer than 75 days. More than 37 percent of these workers were under 20 years of age.^{5/}

The May 1979 Current Population Survey (CPS) provides the most recent available statistics on pension coverage.^{6/} This survey is based on a sample of households representing the U.S. civilian workforce. Table I shows the implications of moving from the total workforce to an employee population more appropriate to the employer pension coverage issue. Narrowing the population to the relevant workforce increases the coverage rate from 56 to more than 74 percent. Participation rates rise from 45.6 to 68.3 percent. Since some CPS respondents did not know their pension status the participation ratio may be more than 70 percent for these workers. Further analysis of the May 1979 CPS indicates that among participants, more than 80 percent of those who were in current employment ten or more years had vested in present employer plans. Among all relevant workforce participants in May 1979, 55.7 percent were vested in their plan. Another 16.1 percent did not know their vesting status, but many were probably vested.^{7/}

The largest percentage of noncovered workers is in private employment. Thus the private sector is frequently a focus of retirement protection policy initiatives. Firm age and firm size are important indicators of economic stability; they directly relate to an employer's ability to establish a pension program. Our analysis showed that firms with fewer than 25 workers provided jobs to only 19 percent of the relevant workforce in 1979, but they accounted for 48 percent of all jobs without pension coverage. Firms with fewer than 100 workers provided 31 percent of relevant workforce jobs but 67 percent of jobs without pension coverage. Industry category also affects pension availability. For example, the trade and services industries accounted for 39 percent of private sector jobs but 58 percent of jobs without pension coverage.^{8/}

Our research also indicated that employee characteristics such as age, salary level and employment stability affect a worker's ultimate potential to receive pension benefits. In 1979, workers earning less than \$10,000 accounted for 28 percent of relevant workforce employment but 44 percent of jobs without pension coverage. Fewer tax incentives and high Social Security replacement rates contributed to this reduced pension coverage for low-income

Table 1

**Pension Coverage and Participation Status
Civilian Workers-May 1979**

Item	COVERED WORKERS			Don't Know Participation Status (percent) ¹	Workers Not Covered (percent) ¹	Don't Know Coverage Status (percent) ¹
	Total Workers (millions)	Participants (percent) ¹	Nonparticipants (percent) ¹			
Total civilian workforce	95.4	45.6%	9.2%	1.2%	37.0%	6.9%
Total civilian workforce ages 25-64	71.3	53.8	6.8	0.8	33.7	4.8
Civilian nonagricultural em- ployees ages 25-64 ²	63.2	58.8	7.7	1.0	27.3	5.3
Civilian nonagricultural em- ployees ages 25-64 working more than 1,000 hours per year ^{2,3}	58.0	62.6	6.8	1.0	25.8	3.9
Civilian nonagricultural em- ployees ages 25-64 working more than 1,000 hours per year and with current em- ployer more than one year (relevant workforce) ^{2,3,4}	49.7	68.3	5.0	0.8	23.2	2.7

Source: ICF tabulations for EBRI of May 1979 CPS data.

¹Total may not sum to 100 percent due to rounding.

²Excludes individuals whose only employment was self-employment.

³Excludes individuals whose hours per year could not be computed.

⁴Excludes individuals who did not know how long they had been with their current employers.

workers. Those who were with present employers for fewer than five years accounted for 42 percent of jobs but 58 percent of jobs without pension coverage.

These data indicate that there is still substantial room for expanding the private pension system. The fundamental policy issue is whether or not current policies can be modified to achieve further growth or whether radical new approaches are needed.

The Historical Growth of Private Pensions. Table 2 presents information which has led some analysts to conclude that the private pension system is stagnating. The pension participation rate appeared to stabilize during the latter part of the 70's. However, focusing on the participation rate is misleading. While the participation rate grew by only 23 percent between 1950 and 1979, the actual numbers of new participants grew by nearly 260 percent. Several factors contributed to the temporary stabilizing of the participation rate after 1975.

(1) There was an extremely rapid growth in the private sector workforce from 1975 to 1979. Private employment levels grew as much in those five years as they had in eleven years from 1964 to 1975. This private employment growth resulted from the maturing baby boom generation and higher female worker participation. The net effect of this massive infusion of new workers was to reduce the average age of those in the workforce.

Much of the 1970s employment growth occurred in small firms with fewer than 100 employees (57.6 percent of employment growth) and in the trade and services

industries (54.6 percent). As noted previously, noncoverage rates are currently highest in small firms and the trade and services industries. As the baby boom workers mature and stabilize in work situations, many will satisfy pension plan participation requirements. Additionally, according to macroeconomic estimates of Data Resources Incorporated (DRI) as well as Wharton Econometric Forecasting Associates (WEFA), employment growth between 1980 and 1985 should be less than one-half the 1975 to 1979 increase. This declining labor force growth should positively affect plan participation rates.

(2) Another factor that may have contributed to the private pension growth slowdown is the real increase that occurred in Social Security costs during the seventies. Whether employers or employees absorb payroll tax increases, such additional wage-related costs limit the ability to expand pension plans. Payroll taxes and pension costs are both employer labor expenses; they result in higher production costs or lower levels of alternative compensation. Social Security tax increases potentially crowd out expanded use of employer pension programs.

(3) ERISA has had two effects on private pension participation rates. First, it specifies minimum coverage and participation standards. Where private employers provide pensions, ERISA designates which employees must participate. The 1980 Bankers' Trust Study of Corporate Pension Plans indicated that after ERISA's implementation, an earlier trend toward eliminating participation requirements was reversed. Appar-

Table 2
Wage and Salary Workers in Private Sector, Nonagricultural Establishments and Pension Participation 1950-1979

Year	Private Sector Wage & Salary Workers (000's)	Workers Participating in Private Pensions (000's)	Participation Rate
1950	39,171	9,800	25.0%
1951	41,430	10,800	26.1
1952	42,185	11,300	26.8
1953	43,557	12,600	28.9
1954	42,239	13,400	31.7
1955	43,727	14,200	32.5
1956	45,091	15,500	34.4
1957	45,237	16,700	36.9
1958	43,485	17,200	39.6
1959	45,185	18,200	40.3
1960	45,836	18,700	40.8
1961	45,405	19,200	42.3
1962	46,659	19,700	42.2
1963	47,427	20,300	42.8
1964	48,687	20,900	42.9
1965	50,691	21,800	43.0
1966	53,117	22,700	42.7
1967	54,412	24,300	44.7
1968	56,058	24,800	44.2
1969	58,189	26,000	44.7
1970	58,326	26,100	44.7
1971	58,333	26,400	45.3
1972	60,342	27,500	45.6
1973	63,059	29,200	46.3
1974	64,095	29,800	46.5
1975	62,260	30,300	48.7
1976	64,511	30,700	47.6
1977	67,345	32,000	47.5
1978	71,025	33,700	47.5
1979	73,966	35,200	47.6

Sources: Employment data are from Department of Labor, Bureau of Labor Statistics, presented in 1981 *Economic Report of the President*, Table B-35, p. 273; the pension participation data are taken from Alfred M. Skolnik, "Private Pension Plans, 1950-1974," and Martha Remy Yohalem, "Employee Benefit Plans, 1975," *Social Security Bulletin*, June 1976 and November 1977, respectively.

ently, ERISA encouraged plans previously without participation restrictions to adopt ERISA minimum standards. Implementing the 25/1/1000 requirements of ERISA resulted in the exclusion of many new young workers from participation.

A second, more important effect of ERISA is shown in Table 3. ERISA was signed into law on September 2, 1974. It was implemented during 1975 and 1976. The table shows the levels of plans that were issued IRS tax qualification letters and plan termination from 1956 to 1980. ERISA's initial effect on plan creations and terminations is stark. The slowdown in net plan qualifications during the latter half of the seventies contributed to the stabilization of the participation rate. Based on pre-ERISA plan creation rates, 135,000 plans were lost from 1975 to 1980. However, in the last three years, plan creation levels have improved suggesting ERISA's effects on reducing plan creations were temporary.

Implications of recent experience on the private pension plan participation rate is significant. However, recent employment growth is not expected to persist; the baby boom cohort will mature and become partic-

ipants in the pension system: Social Security's recently expanding costs will probably stabilize; new pension plan creations indicate the system has recovered from ERISA's initial shocks and suggests pension coverage growth for the future.

Forecasting Future Pension Growth. The Pension Commission's use of modeling in determining the future course of pension growth involved two separate models. Both were developed by ICF, Incorporated. The first was an adaptation¹¹ of the Private Pension Forecasting Model originally developed for the Department of Labor. The second was a microsimulation model developed for the Commission, paid for by the Department of Labor. A revision of this model is currently being developed by ICF for EBRI and the American Council on Life Insurance. These models are very different in their approaches. The Private Pension Forecasting Model, as adapted for the Pension Commission, can be thought of as a supply model. It forecasts pension coverage and participation levels as well as the number of pension plans and the number of separated vested participants. As input the model utilizes the number of jobs categorized by industry, for future years in the forecast period. DRI forecasts of industry employment levels were used.

Table 3
Corporate and Self-Employed Pension Plan Creations, Terminations and Net Plan Increases¹

Year	Defined Benefit Plans			Defined Contribution Plans			Net Total Plans Created
	Plans Qualified	Plans Terminated	Net Plans Created	Plans Qualified	Plans Terminated	Net Plans Created	
1956	3,175	192	2,983	2,072	111	1,961	4,944
1957	3,527	180	3,347	2,898	171	2,727	6,074
1958	3,883	224	3,659	3,071	179	2,892	6,551
1959	3,824	270	3,554	3,442	204	3,238	6,792
1960	5,011	300	4,711	4,946	258	4,688	9,399
1961	4,919	374	4,545	4,468	361	4,107	8,652
1962	5,188	476	4,712	5,030	383	4,647	9,359
1963	5,840	441	5,399	5,304	453	4,851	10,250
1964	6,581	509	6,072	5,127	532	4,595	10,667
1965	7,495	512	6,983	6,037	524	5,513	12,496
1966	10,124	603	9,521	8,059	607	7,452	16,973
1967	11,292	602	10,690	9,229	705	8,524	19,214
1968	12,896	672	12,224	10,886	771	10,115	22,339
1969	14,692	868	13,824	13,383	861	12,522	25,905
1970	16,512	1,142	15,370	16,062	1,164	14,898	30,268
1971	22,493	1,605	20,888	18,171	1,730	16,441	37,329
1972	28,265	1,745	26,520	21,070	1,775	19,295	45,815
1973	33,830	2,222	31,608	25,775	1,908	23,867	55,475
1974	32,579	2,577	30,002	26,806	2,207	24,599	54,601
1975	15,319	4,550	10,769	14,720	3,558	11,162	21,931
1976	4,790	8,970	-4,180	23,334	15,660	7,674	3,494
1977	6,953	5,337	1,616	28,463	10,478	17,985	19,601
1978	9,728	4,625	5,103	55,956	10,661	45,295	50,398
1979	15,755	3,267	12,488	41,122	7,574	33,548	46,036
1980	18,849	4,297	14,552	50,493	8,982	41,511	56,063

Source: EBRI compilation of Internal Revenue Service data.

¹Based on IRS plan qualification determination letters.

Table 4

Alternative Forecasts of Private Sector, Nonagricultural Wage and Salary Workers' Pension Participation Rates From the Private Pension Forecasting Model Under Various Model Specifications

Model Specification	Forecast	
	1985	1990
Pension Commission's:		
"No Growth"	45.7	45.7
"Moderate Growth"	47.8	49.9
"High Growth"	48.5	51.4
Unconstrained:		
(1979 Benchmark)	49.5	52.6
(Proportional Growth)	52.2	56.8

"high" growth assumptions. EBRI had ICF remove the Commission's constraints and re-run the model.

In its third stage, the model's age/sex/industry employment distributions were developed based on the May 1979 CPS estimates. Then employment separated into age and sex classifications, was estimated for 1985 and 1990 using a Macroeconomic Growth Model adapted by ICF. Employment categorized by industry for 1985 and 1990 was taken from DRI forecasts, and converted jobs to employed persons. Then an iterative scaling or statistical ranking technique was used to develop age/sex/industry employment levels in each of the two forecast years.

In its fourth stage the model forecasts participation. Baseline participation estimates were based on the May 1979 CPS rates for each industry/age/sex category. Participation was assumed to grow at the same rate as coverage, as estimated on an industry-by-industry basis in the model's second stage.

Table 4 includes five sets of participation forecasts generated by the model that was reformulated for the Commission. The first set assumed there would be no growth in participation levels beyond rates demonstrated by the May 1979 CPS estimates. Moderate and high growth forecasts were developed using the Commission's assumed coverage constraints. The unconstrained forecast provides a measure of the effect the Commission's constraints had on their participation forecasts. Their forecasts, of course, were central to their "no significant future growth" conclusion.

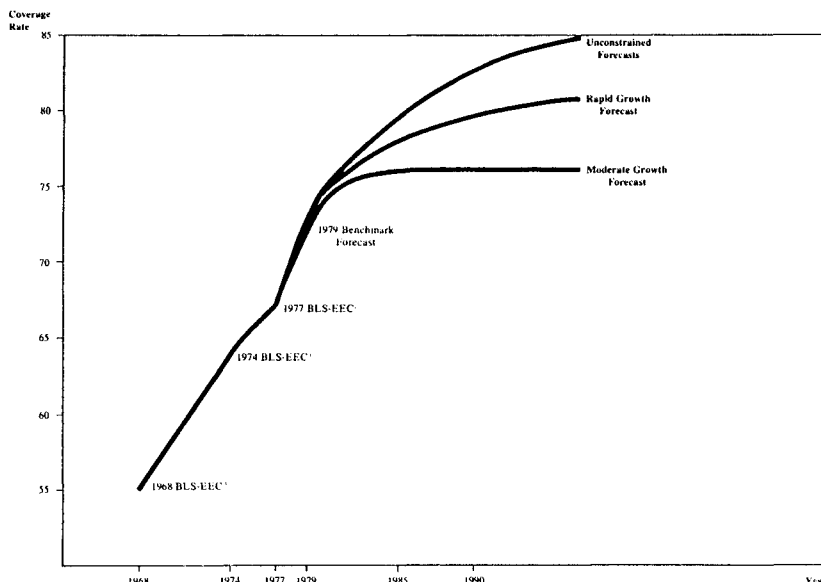
In its first stage, the model disaggregates total private sector, nonagricultural, paid employment by industry and establishment size. Total employment projections are disaggregated of historical trend data from the Commerce Department's County Business Pattern surveys.

The Pension Commission chose to include the self-employed and agricultural workers in their forecasts. We have chosen not to include them because the retirement policy issues for these particular two groups deserve separate consideration. The reasons for their select treatment were discussed earlier in defining a relevant workforce for employee pension consideration.

In its second stage, the model's coverage forecasts are developed for each industry-size category based on historical coverage patterns for each industry-size group. Coverage data generally reflect that growth is higher in industries and establishment sizes with low total coverage. Alternatively, the data suggests that pension coverage growth rates decline as industries and employer groups approach higher coverage levels. The model incorporates this experience by forecasting future coverage levels, using an exponential growth function.

The Pension Commission further limited coverage growth in their forecasts by maximum coverage constraints in several of the industry-size categories. These maximum constraints were generally applied to categories where the greatest potential for future coverage growth existed. Figure 1 shows two coverage forecasts described by the Pension Commission as "moderate" and

Figure 1
Alternative Forecasts of Private Pension Plan Coverage Rates



¹Coverage estimates based on this survey tend to overestimate actual coverage levels. This occurs because the survey measures the number of jobs provided by employers who offer pension plans. It includes workers who fall in job classes that employers may explicitly exclude from their pension programs. The survey is consistent in its measure of pension coverage, however. While it may overstate pension coverage at a single point in time, it is a good indicator of coverage growth over time.

The last forecast shown in the table indicates another potential problem. The Pension Commission participation forecast used 1979 as its base year, but its coverage forecast used 1977 as the base year. From 1977 to 1990 the moderate growth model forecasted a 9 percentage increase in coverage. However, 56 percent of this growth was projected to occur in the first two years of the forecast period. Nearly 40 percent of forecasted pension growth in the high growth model was predicted to occur in the first two years of the 13 year coverage forecast. The problem is that none of the forecasted coverage growth prior to 1979 had any effect on forecasted participation growth. If the assumption is right that coverage growth during the years 1977-1978 would greatly exceed subsequent annual growth, the results of the model would seem plausible. If net plan creations are used as a measure of pension growth, neither of the posited scenarios seems reasonable, however. In the two year period where the Pension Commission forecasts predicted 56 and 40 percent of the 13-year growth forecasted, fewer than 70,000 net new pension plans were created. The IRS net plan creation data for January 1979 through June 1981 indicate an increase of more than 128 thousand plans. Unless there is some major reversal to a history of new plan creation that dates back 30 years, it is likely that plan growth will continue through the remainder of this decade. On that basis it is unlikely that anything approaching 40 percent of coverage growth between 1977 and 1990 could have occurred during the first two years of the period. This strongly suggests that the model specification used to develop the Pension Commission forecasts would underestimate pension participation growth. The last forecast in Table 4 assumes that future growth would occur on a linear basis. Under this assumption, the selection of different forecasting periods for coverage and participation is less significant. This formulation of the model predicts nearly twice as much growth in the pension participation rate between 1979 and 1990 as the President's Commission's "high growth" formulation. The primary point to consider is: Under less restrictive constraints or alternative formulations, the Pension Commission's conclusion based on this model's results would have been much different. Under alternative assumptions and slightly different model specifications, the Commission may have concluded that future pension growth would be significant.

The Work History and Retirement Benefit Simulation Model. developed by ICF for the Pension Commission²⁷ is the second model used by the Commission in developing its analysis, conclusions and recommendations. The Model is presently undergoing substantial modification. The implications of these modifications are not yet clear but they may be substantial.

This microsimulation model could be characterized as a "pension demand" model. It is a two-stage system. The work history component simulates individual labor force experience. It estimates an individual's annual employment hours and earnings levels. The simulations are performed on a "closed population" since there is no birth or worker component that replaces young workers as they age. The model simulates year-to-year changes in individual marital and work status and builds a history for each worker that is used to estimate individual pension and Social Security benefits.

The output of the Work History model is used as input for the Retirement Benefit Simulation Model. In this stage, pension plan coverage is assigned. Each worker covered by a pension plan is assigned a specific pension plan from a sample of 270 such plans. The participation criteria determine if, and when a worker is designated as an active participant. Where a basic plan is coupled with a supplemental plan, the additional coverage is assigned to the worker.

The base year used in the simulation prepared for the Pension Commission model was 1979. Initial plan coverage and participation were assigned based on the May 1979 CPS which had been adjusted for non-response. The model was used to simulate pension coverage, participation, vesting and benefit receipt under current policy as well as under a series of policy alternatives. The alternative simulation results were compared with the current policy simulation results to identify potential effects of specific options.

In the current policy case, first year pension coverage estimates were derived directly from the May 1979 CPS. During the simulation process as workers changed jobs, pension coverage was considered to be a function of the individual's industry, hours worked, age and indexed wage rate.

In the current policy case the Commission assumed that there would be no increase in plan availability. Thus if a worker stabilized in a noncovered job the model did not allow for the probability that the employer would offer future pension protection. This is an important potential weakness since the universe of pension plans has expanded by 32.5 percent in the last three years alone. Some of these plans were supplemental, but neither initial plan offerings nor supplemental plan additions were considered in this Commission's simulation. Initial plan offerings are particularly important when developing future benefit receipt estimates. Initial and supplemental plan availability is important in estimating future retirement benefit levels.

Thus, the only way coverage levels could increase in the Commission's simulation was through the job change process. When a worker changed jobs, coverage was assigned based on industry, hours worked, age and indexed wage rate. However, trends in plan coverage were controlled

strictly through the assumed rate of change in indexed wages. In the work history model real wages were generally assumed to grow at a rate of 1 percent per year. Yet in the model's benefit simulation component the Pension Commission's staff assumed that for estimating coverage, individual wage rates should be deflated by the wage index. This, in essence, cancelled the effect of future real wage increases on forecasted pension coverage and participation levels. The report to the Commission on the simulation results states: "deflating by this increase in average wages produces no significant trends"^{13/} in future pension coverage.

Their current policy simulations also did not provide for potential IRA expansion. It did provide that those over the age of 40 who "cashed out" their vested pension equity would roll over such equity into an IRA. There was not testing, however, of alternative scenarios of IRA growth that considered the potential for expanded IRA availability, or increased interest in IRAs because of alternative tax treatment of contributions to them.

Analysis of Pension Commission modeling efforts shows that the results were extremely sensitive to the underlying assumptions. Alternative assumptions would have provided very different scenarios of the private pension system's future. These alternative scenarios may have led the Commission to different conclusions and different policy proposals.

One surprising result of the simulations produced for the Pension Commission forecasted that more than 70 percent of today's young workers can expect to^{14/} receive pension benefits at retirement. This was overlooked in the Commission's final report. However, it is very important for pension policy consideration and for retirement policy in general.

FOOTNOTES

- 1/ Sylvester J. Schieber and Patricia M. George, Retirement Income Opportunities in an Aging America: Coverage and Benefit Entitlement(EBRI: Washington, D.C., July 1981).
- 2/ The President's Commission on Pension Policy, Coming of Age, Toward a National Retirement Income Policy (Washington D.C., 1981).

- 3/ Ibid., p. 28.
- 4/ Peter Diamond and Jerry Hausman, "Individual Savings Behavior". Paper prepared for the National Commission on Social Security(Washington, D.C., 1980). p.22.
- 5/ Bureau of the Census, Statistical Abstract of the United States: 1980, Table 1241, p. 708.
- 6/ For a description of the Current Population Survey, see the U.S. Department of the Census, "The Current Population Survey -- A Report of Methodology," Technical Paper, No. 7 (Washington, D.C., 1963); U.S. Department of Commerce, Bureau of the Census, "The Current Population Survey -- A Report of Methodology," Technical Paper, No. 40 (Washington, D.C., 1978); and Marvin M. Thompson and Gary Shapiro, "The Current Population Survey: An Overview," Annals of Economic and Social Measurement (Washington, D.C., U.S. Department of Commerce, Bureau of the Census, 1973).
- 7/ Op.cit., Schieber and George, p. 30.
- 8/ Ibid., p. 49.
- 9/ Ibid., p. 51.
- 10/ Ibid., p. 59.
- 11/ ICF, Incorporated, A Private Pension Forecasting Model, Developed for the Department of Labor (Washington, DC, 1979).
- 12/ ICF, Incorporated, Background Analysis of the Potential Effects of Minimum Universal Pension System. Developed for the President's Commission on Pension Policy and the Office of Pension and Welfare Benefit Programs (Washington, DC, 1981).
- 13/ Ibid., Appendix C, p. 25.
- 14/ Ibid., p. 38.