PENSION FORMULA SUMMARIZATION - AN EMERGING RESEARCH TECHNIQUE

Arnold Strasser*
Presented at the December 16, 1970 Bureau of Labor
Statistics' seminar on pension research.

The Bureau of Labor Statistics has long recognized the need for

an objective method with which to analyze the level of pension benefits

provided by current formulas. Such information is needed for four purposes.

First, to permit comparisons of the normal retirement formulas in private

plans on an objective basis; second, to permit examination of trends in

benefit formulas; third, for analyses of the relationship between retirement

and preretirement income; and fourth, to determine if retirement income

provided by current formulas will, in conjunction with social security, be

sufficient to maintain the standard of living workers enjoyed before they

retired. To see whether workers can even afford to retire, estimated total

retirement income including social security, produced through an objective

summarization technique, can also be compared with the cost of various BLS

budget for a retired urban couple.
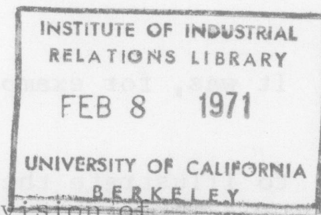
The complexity of the data needed has grown considerably within the past ten years. Previously, the normal retirement formulas of the overwhelming majority of private pension plans either provided the same benefit to all retirees, varied the benefit solely on the basis of years of service credited to the worker, or based the pension benefit on the worker's average earnings throughout his covered career.

These three types of benefit formulas could be, and beginning with the Bureau's first Digest of 100 Pension Plans Under Collective Bargaining, which was issued in 1958, 1/ were arithmetically summarized by applying the plan's normal retirement benefit formulas to earnings that were assumed to be the same each year during specified periods of service. This simple approach placed all plans on common footing. It illustrated the benefits provided under each plan's formula and permitted reasonably objective comparison of plans and analyses of trends. This type of approach is still being used. It was, for example, used this year by the Bankers Trust Company - New York to illustrate the formulas of individual plans and it provided the basis for

---

1/ BLS Bulletin 1232. The Bureau had previously issued two Digest of Selected Health, Insurance, Welfare, and Retirement Plans Under Collective Bargaining. These did not provide arithmetic summarizations of the benefit formulas.

the analytical comparison of pension formulas by type presented by the

Bank in its 1970 Study of Industrial Retirement Plans. 2/

However, the simple level earnings approach, based on a level

earnings curve assumption, does not permit a realistic comparison of plans

when some of them use earnings in the terminal or highest earnings years in

the computational procedure. Furthermore, realistic examination of the

relationship between preretirement and employment related retirement income,

and the relationship between living standards flowing from an employment-

related income stream--before and after retirement--cannot be estimated with-

out information about earnings immediately prior to retirement. Obviously,

a level earnings assumption cannot provide such information.

A brief example should serve to demonstrate why a simple level

earnings summarization technique is an unsatisfactory device with which to

compare plans some of which base the pension benefit on terminal earnings.

2/ The ninth in a series dating back about 30 years.

A level earnings curve assumption applied to terminal earnings

plans markedly reduces the earnings against which the formula's percentage

factors are applied. For example, in the case of a hypothetical plan whose

benefits are computed on the basis of 1 percent of the salary in the last

year worked times years of service, the monthly private benefit for a worker

whose career average earnings were \$4,800 during a service period of 30 years

would be \$120 $\left(\frac{(.01 \times 4,800)\ (30)}{12} \right)$ under the zero earnings curve assumption.

However, the final year's earnings used in the computation would be \$8,004

under a dynamic curve hypothesis based on a 4 percent annual increment

and the same career average earnings. This final earnings estimate results

in a monthly benefit of \$206 $\left(\frac{(.01 \times 8,004)(30)}{12} \right)$ or almost three-fourths

more than indicated by the level curve. Of course the curve increment hypoth-

esized will have a marked effect on the final computed benefit.

Plans using terminal or high earnings formulas to compute pension benefits are an important and apparently growing segment of the private pension system, and particularly of the single employer plan segment. In our most recent study of the private pension system 3/ we found that benefits of about 27 percent of the active plan participants are computed on the basis of their terminal or highest earnings. Considering the recent auto settlement and the August 1969 change in the big steel formulas--affecting workers earning more than $7,800--we estimate that about one-third of the active plan participants are in plans with benefits computed on the basis of terminal or high earnings. Our statistics indicate that only about one-sixth of the plan participants at the beginning of the last decade were covered by plans where terminal or high earnings formulas would have been used to compute their benefits. 4/

3/ Harry E. Davis and Arnold Strasser, "Private Pension Plans, 1960 to 1969 - an overview," Monthly Labor Review, July 1970 (Reprint No. 2681, with additional tables).

4/ The estimates for the beginning and the end of the 1960's are based on estimates of the number of covered workers in plans with formulas only using earnings in the terminal or high earnings years and the number of workers affected by the alternative terminal or high earnings formula in plans that provide for the highest benefit computed by alternative formulas.

Recognizing the movement toward terminal or high earnings formulas, particularly in single employer plans, the Bureau sought a research technique that could be used in objectively summarizing the benefit formulas of all plans. The first step toward the development of such a technique was taken in 1968-69. Harry Davis, in his May 1969 Monthly Labor Review article describing changes in those pension plans under collective bargaining that are included in the BLS Digests, summarized the plans by applying the following standard assumptions to the benefit formulas: (1) worker's beginning plan participation at age 35 would be retiring in 30 years at age 65; (2) their earnings would increase at an average annual rate of 3 percent; and (3) at retirement they would receive the social security benefit indicated by their earnings curve as applied to the social security benefit formula existing at the time the study was conducted.

A like technique, based on future service, but using a 4 percent earnings curve, was applied to the plans included in our newest pension digest. Incidentally, this new digest (BLS Bulletin 1692), which we expect will be available from the printer early next year, includes both plans under collective bargaining and plans for salaried workers. It also provides

data about plans in more industries and is in a new format which permits

presentation of more detail than was possible in the old Digests. This Digest

will be available on a subscription basis only. We plan to issue supplements

to the Digest at least twice a year. These supplements will provide the

latest available information about those plans that were modified since the

last supplement was published.

The Bureau's early approaches toward an objective method of com-

paring the formulas of all pension plans suffered from another basic

deficiency. The use of a future service concept meant that we were projecting

current formulas into the future. A consistant application of the approach

required that we take known future changes into consideration in summarizing

the plan. The problem was accute with respect to offset plans. For these

plans the social security benefit used as the reduction factor was the

maximum possible benefit which would have been earned years hence under

the formulas provided in legislation on the books at the time the plan was

summarized. A like siuation existed with respect to split earnings formulas

that specified the split was to be based on the maximum earnings subject to

social security taxes. Because future social security benefits rise as

a result of legislation now on the books, and higher future taxable earnings

limits have increasingly been incorporated into legislation, the level of

benefits of integrated plans was estimated to be lower than if the analysis

had only taken the current situation into consideration. As a result, plans

whose formulas were directly integrated with social security were being

treated differently from all other plans.

We have, in recognition of these deficiencies, modified our

summarization technique to reflect only the current social security situation.

We did this by applying the current formula to assumed past service. Thus,

our standard assumptions now provide for the immediate retirement at age 65

of a hypothetical set of workers with specified periods of service. Further,

the career average earnings of these workers are computed on the basis of

a dynamic earnings curve. In essence, our new approach seeks an answer to

the question--what benefits would be paid to a worker retiring today if the

current formula had been in effect throughout his entire period of employment

with the firm from which he retires.

In our new approach we have also changed our definition of service

to directly conform with the service definition of each plan. Previously

we had defined service to mean participatory or credited service. However,

a number of plans have preparticipation requirements and many of these do

not later credit participating workers with such service. In 1969, for

example, 22 percent of the covered workers were in plans that had a prepartici-

pation service requirement, and 78 percent of these--slightly more than

one-sixth of all plan participants--were in plans that did not credit pre-

participation service toward either the required service for normal benefits

or in the computation of the pension benefit.

To appropriately reflect these differences, we now define service

as the total period of employment with the firm, including employment prior

to plan participation as well as all years of participatory service. Thus,

if we are applying a formula with a 5-year preparticipation clause to a

30-year curve, we credit 25 years of participatory service. Of course, if

the plan provides credit for the preparticipation service we apply the entire

30-year service-earnings curve to the formula.

At this point, a general comment might aid in the broader
discussion of private pension plan research and analysis. In the analysis
of private pension plans, some consideration should be given to the fact
that each plan is designed to meet a specific set of needs and goals. These
can be met through alternative approaches which are selected and shaped by
the socio-economic framework in which the plan is designed to operate. In
the case of the preparticipation requirements, for example, career earnings
plans that do not credit preparticipation service offset part of the reduc-
tion in credited service by effectively increasing career average earnings.
This is a by-product of the elimination of the first few years of service--
which are typically the worker's lowest earnings years in any employment
situation. Of course, preparticipation service requirements do not affect
uniform benefit plans. Further, if credit is not granted for premembership
service, the pension benefit of plans with terminal earnings formulas and
plans that pay flat benefits multiplied by years of service are lower,
ceteris paribus, than if credit is granted. The designers of these plans,
however, have usually taken this diminishing factor into consideration and
built an adjustment factor into the plan's benefit formula.

In concept, our new summarization technique is very easy to apply.

We simply determine which length of service and career average earnings

assumptions are to be used in summarizing normal retirement benefit formulas,

and then construct earnings curves for each set of service-earnings assump-

tion. Before we can construct the curves, however, we must determine which

of a number of alternative growth rates should form the basis for the curves.

The curves we constructed are based on 4 percent growth rates. It can be

argued that this rate is too low and therefore partially distorts the

relationship between plans with terminal or high earnings formulas and plans

with other types of formulas. The overall earnings growth rate data availa-

ble from the Bureau of the Census at least partly supports this contention.

However, during most of the service periods for which we constructed curves

(10, 15, 20, 25, and 30 years) the growth rate data for male clerical, sales,

craftsmen, foremen, operatives, service workers and laborers (other than

farm) hovered closer to the 4-5 percent levels than to any other level. 5/

5/ See U.S. Bureau of the Census, Current Population Reports, Series
P-60, No. 69, "Income Growth Rates in 1939 to 1968 for persons by occupation
and industry groups, for the United States," (GPO, 1970). Many of the
averages on which the growth rates are based were previously published in
the P-60 series.

Earnings growth rates for women are generally lower than those for men. (See table 1.) Our choice of a growth factor was made easier by the knowledge that the vast majority of the covered workers are hourly paid employees in the manufacturing, construction and transportation industries. The growth rates in the manufacturing and in the transportation, communication, and public utility industries during the period 1958 to 1968, the latest for which data were available when the curves were drawn, were between 4 and 5 percent; in construction (which accounts for only about 10 percent of all coverage as opposed to the 75 percent of the other two) the rate was 5.4 percent. To be conservative we used 4 percent increments compounded annually. We probably should have used 4.5 or 5 percent. However, the difference between a 4 percent and a 4.5 percent curve at the earnings levels we were dealing with is quite small; furthermore, for less than 20 years of service the differences between a 4 and a 5 percent curve is also quite small.

We chose to construct the curves to represent annual earnings which over each of the service periods averaged $4,800 and $6,600.

Because we could not do otherwise, we have defined the earnings as being

those which meet each plan's definition of earnings. These career average

amounts, particularly the $4,800 average, result in curves which, especially

over the longer service periods, appear to reasonably correspond to the

earnings of blue-collar workers and of clerical and sales personnel during

the period examined.

The following formula was used in constructing each curve:

$$\left(\frac{\text{Career average earnings}}{\dfrac{\text{Amount of annuity over total service}}{\text{Total service years}}}\right)\left(\begin{array}{c}\\ \text{Compound amount}\\ \text{of 1}\end{array}\right)^{\text{Service year}}$$

The resulting standardized curves for the 2 career average earnings levels

and the 5 service periods are presented in table 2.

Having disposed of the simple conceptualization of our new approach

and the construction of earnings curves we needed to apply the technique and

thus put it to the test. At hand we had information for 1,433 plans selected

according to an optimumly allocated stratified random probability sampling

scheme from among all pension plans filed with the Department of Labor under

the provisions of the Welfare-Pension Plan Disclosure Act. The data relating

to mid-1969 had been compiled for use in the pension study reported in the

<u>Monthly Labor Review.</u> 6/ For these plans we had a complete estimating

procedure with which to blow up the results to universe estimates.

Each of the 1,433 plans was examined to determine which approach

it's formula required be used in computing benefits. Those that provided

for the benefit which was the greater as computed by alternative approaches

required far more attention than did the others since we had to summarize

the plan by applying each technique to our standard assumptions. Further,

we had to be particularly careful to count service in accordance with the

plan's requirements. Thus, we excluded premembership service if the plan

did not credit such service in computing benefits. Further complications

were introduced by those few career earnings formula plans that eliminated

some low earnings years from the averaging technique but credited them for

purposes of multiplying the computed benefit rate to derive a benefit amount.

There was an additional complication to attend to. Plans that

offset their benefit by all or part of the social security benefit and plans

that used split formulas that specified the split was to be at the maximum

earnings level subject to social security taxes had to be accounted for.

_____

6/ Davis and Strasser, Op. cit.

Since our approach did not require any projections, it was quite easy to

adjust for these split earnings formulas. To obtain realistic data about

the amount of the social security benefit to use as the offset in plans

providing for them, we enlisted the aid of the Office of the Actuary,

Social Security Administration. They computed the monthly social security

benefit workers would receive if they had retired at age 65 on June 30,

1970, 7/ after having been fully covered since the inception of Social

Security. To simplify the computational precedure, benefits were computed

for two constant annual earnings levels--$4,800 and $6,600. The estimated

benefits at these levels were $150 and $159 respectively. The level earn-

ings approach used in estimating social security benefits, although

different from that used in computing private plan benefits and deficient

for all of the reasons previously noted, is considered to have relatively

little impact on the computed value. This is so because earnings over

$4,200 were not credited until 1959 and those over $4,800 were not credited

until 1966. Nevertheless, in the future, when earnings over $4,200 will

---

7/ Beginning January 1, 1970, as provided by the 1969 Social Security
amendments, larger social security benefits were paid new retirees.

have a greater effect on the final benefit, our estimates of social

security benefits will be based on the same dynamic curves used in computing

private plan benefits.

Applying our standard assumptions to the formulas of the plans

for which we had information produced a series of tabulations which provide

information about the retirement income, including and excluding estimated

social security benefits, that the current formulas would have produced had

they been in effect throughout the workers entire service period. These

tabulations, for each type of plan formula and each service-earnings assump-

tion, are like table 3 which presents data for the $4,800, 10 and 30 year

career earnings assumptions. The data presented show the percent of

estimated active workers, in the universe sampled, covered by plans whose

formulas produce the results indicated.

Although the detailed analysis of our findings won't be available

for some time, we have some preliminary findings that you may find interesting.

As expected, there is a high proportion of workers who participate in plans

that do not pay any benefits to short-term employees. In all, more than

two-fifths of the plan participants are in plans that do not pay any

benefits toworkers with ten or fewer years of service. The statistics range

from 78 percent in the mining industries and about 60 percent in the contract

construction, transportation, communication, and public utility industries,

to 21 percent in the finance, insurance, and real estate industries. The

high proportion of finance, insurance, and real estate workers who participate

in plans that do pay some benefits to short term workers undoubtedly reflects

the high prevalence of immediate full vesting in insurance industry plans -

the only industry where any important proportion of workers are in plans

providing for the full vesting of all benefits as soon as they accrue.

We also found, as indicated in table 3, that about 1 percent of

the covered workers are in plans that do not provide any benefits to

some workers even after 30 years of employment. In some cases this results

from the impact of preparticipation requirements, participatory service

requirements, or both. In the dominant number of cases, however, this is

because pension credit is only given for earnings above a specified earnings

level usually that subject to social security or railroad retirement taxes.

Only those workers covered by single-employer plans are in plans

that deny benefits to long service workers. Oddly enough this is particu-

larly true in those plans that require employees to contribute toward their

pension. Of course, these plans do not require employees to make any

contributions for earnings not creditable toward a pension. Industrially,

transportation workers, principally railroad office and management personnel,

are more likely to be in such plans than are workers in other industries.

Nevertheless, plans covering a proportionately few workers in the manufac-

turing, trade, and the finance, insurance and real estate industries have

such provisions.

The results of the application of the $4,800 career earning

assumptions over 10, 15, 20, 25, and 30 year service periods are indicated

in table 4. These data show that even after 30 years of service private

pensions provide retirees, whose service-earnings are like those simulated

by the curves, with an average benefit equal to less than 25 percent of their

final years earnings. Combined with his social security benefit, however,

the income replacement ratio rises to 37 percent for workers on the ten-year

curve and to about 43 percent for workers on the 30-year curve.

The data show that there is a high degree of equality in the payout by private plans for workers with 30 years of service with their pensioning firm. The greatest degree of equality, or similarity in benefit levels, is found among noncontributory single employer plans. Industrially, the greatest uniformity in payouts is made by communication and public utility industry plans. At the 10-year service-earnings level, the greatest degree of equality in private plan payouts is found in the finance, insurance, and real estate industries--where, as noted before, there is a greater probability of a worker receiving a pension after short periods of employment than exists in other industries.

The relationship which exists between the worker's retirement income, considering first only his pension and social security and secondly his family retirement income which includes a one-half social security benefit for his wife, and the budget requirements for an urban retired couple are also shown in table 4. The data show that on the average workers with less than 20 years of service with the firm from which they draw a pension, receive a pension benefit which even when combined with social security is

insufficient to maintain a lower budget standard as indicated by the BLS

budget estimates. If their wives are eligible for a one-half social

security benefit, however, the data indicate that they will have sufficient

funds with which to maintain a lower budget standard with some money left

over.

It is significant, however, that even when social security benefits

are considered in computing workers retirement income, the retirement

income of all or virtually all of the workers on the ten-year curve, as

shown in table 3, will be insufficient to provide a lower budget standard

of living. The data also reveal that about 30 percent of the 25-year workers,

and proportionately more of the workers with fewer years of total service

with their pensioning firm, will receive a retirement benefit which when

combined with social security is still insufficient to maintain a lower

budget standard. Moreover, for many of these workers the addition of a

spouse's social security benefit will still leave them short of a minimumly

adequate budgetary standard.

On the average, the 25 and 30 year worker's private plan benefits,

in conjunction with social security, are sufficient to maintain lower budget

standards without further supplementation. Moreover, the 30-year worker's

retirement income, when augmented by a one-half benefit for his spouse, is

sufficient for them to maintain an intermediate standard of living.

These findings indicate that many of America's lower earnings

workers, and even many of those who are fortunate enough to receive a private

pension, will live out their retirement years just slightly over the poverty

line. This strongly suggests a need, though not the method, to improve the

retirement income picture for these lower earnings workers. The need for

such improvement, becomes especially obvious when we recognize that about

two-thirds of the employed private nonagricultural work force is not now

covered by private pension plans. 8/

The title of this paper indicates that the development of the

technique I have been describing is only in its beginning state. Actually

we have traveled fairly far toward designing a completed summarization

technique. However, we have yet to tackle the really knotty problems of

incorporating the entire retirement program of firms whose programs, for

example, consist of both pension and profit sharing retirement plans. Recent

---

8/ Davis and Strasser, Op. cit.

studies by the Profit Sharing Research Foundation and the Council of Profit

Sharing Industries 9/ reveal that important numbers of workers are covered

under both types of retirement plans. Since the benefit provided by either

type of plan, where both exist, will undoubtedly be lower than if only one

existed--and since they are alternative approaches to the same end--it is

important for us to learn how, and then to meld them into a cohesive unit

for purposes of our analytical examination. Our new technique will simplify

the problem for us because we won't have to project profits into the future.

Nevertheless, as you can imagine, the problem is very difficult.

In future application of our technique, we expect to improve it

by designing our earnings growth curves in accordance with the patterns

of growth in each industry. After all, the plan designers established each

plan within a socio-economic framework that took the real growth patterns

into consideration. The closer we can come to capturing within our

synthesizing process the framework in which the designers worked, the more

accurate our results will be.

9/ See, for example, Metzger, B. L., Profit Sharing in Perspective, second
edition, Profit Sharing Research Foundation, Evanston, 1966 and "Annual Survey
of Employer P/S Contributions," Profit Sharing, September 1970. Also see, Gunnar
Engen, "A New Direction and Growth in Profit Sharing," Monthly Labor Review,
July 1967.

The future application of the technique, of course, depends on the availability of resources. Should they prove sufficient, we hope to apply the technique to early retirement formulas, disability retirement formulas, and survivorship benefits. The examination of both disability retirement and survivorship will, of course, again force us to face up to insurance and other alternatives to pensions that are available to plan designers.

Table 1. Annual Compound Growth Rates, 1939 to 1968, 1950 to 1968, 1958 to 1968: Wage and Salary Earnings of Workers Over 14 years of Age, by Occupation and Sex.

Occupation	1939 to 1968		1950 to 1968		1958 to 1968	
	Men	Women	Men	Women	Men	Women
Professional, technical and kindred---	5.8	6.0	5.0	5.1	4.6	4.7
Managers, officials and proprietors----	5.4	5.2	4.9	4.8	5.1	3.9
Clerical and kindred-------------------	5.5	4.9	4.6	3.6	4.4	2.8
Sales----------------------------------	6.2	4.2	4.7	3.3	5.4	2.6
Craftsmen, foremen and kindred--------	6.2	N/A	4.5	N/A	4.3	N/A
Operatives and kindred----------------	6.4	6.3	4.5	4.2	4.5	5.0
Service workers, except private household-----------------------------	6.0	5.0	3.8	4.7	3.7	4.9
Laborers, except farm and mine--------	6.2	N/A	4.2	N/A	4.5	N/A

N/A - Not available.

Source: U.S. Bureau of the Census

Table 2.

Standarized earnings curves for workers whose career average earnings, during the specified years of service, was $4,800 and $6,600

Years	$4,800					$6,600				
	10 Years	15 Years	20 Years	25 Years	30 Years	10 Years	15 Years	20 Years	25 Years	30 Years
1	3,998	3,596	3,224	2,881	2,568	5,497	4,944	4,433	3,962	3,530
2	4,158	3,740	3,353	2,996	2,671	5,716	5,142	4,610	4,120	3,671
3	4,324	3,889	3,487	3,116	2,778	5,946	5,347	4,795	4,285	3,818
4	4,497	4,045	3,627	3,241	2,889	6,183	5,561	4,987	4,457	3,971
5	4,677	4,207	3,772	3,370	3,004	6,431	5,784	5,186	4,635	4,130
6	4,864	4,375	3,922	3,505	3,124	6,688	6,015	5,393	4,820	4,295
7	5,059	4,550	4,079	3,645	3,249	6,955	6,256	5,609	5,013	4,467
8	5,261	4,732	4,243	3,791	3,379	7,234	6,506	5,834	5,214	4,645
9	5,471	4,921	4,412	3,943	3,514	7,523	6,766	6,067	5,422	4,831
10	5,690	5,118	4,589	4,101	4,655	7,824	7,037	6,310	5,639	5,024
11	.....	5,323	4,772	4,265	3,801	.....	7,318	6,562	5,865	5,225
12	.....	5,536	4,963	4,435	3,953	.....	7,611	6,824	6,099	5,434
13	.....	5,757	5,162	4,613	4,111	.....	7,916	7,097	6,343	5,652
14	.....	5,988	5,368	4,797	4,276	.....	8,232	7,381	6,597	5,878
15	.....	6,227	5,583	4,989	4,447	.....	8,561	7,677	6,861	6,113
16	.....	.....	5,806	5,189	4,625	.....	.....	7,984	7,135	6,357
17	.....	.....	6,038	5,396	4,810	.....	.....	8,303	7,421	6,612
18	.....	.....	6,280	5,612	5,002	.....	.....	8,635	7,718	6,876
19	.....	.....	6,531	5,836	5,202	.....	.....	8,980	8,026	7,151
20	.....	.....	6,792	6,070	5,410	.....	.....	9,340	8,347	7,437
21	.....	.....	.....	6,313	5,627	.....	.....	.....	8,631	7,735
22	.....	.....	.....	6,565	5,852	.....	.....	.....	9,028	8,044
23	.....	.....	.....	6,828	6,086	.....	.....	.....	9,390	8,366
24	.....	.....	.....	7,101	6,329	.....	.....	.....	9,765	8,700
25	.....	.....	.....	7,385	6,583	.....	.....	.....	10,156	9,048
26	.....	.....	.....	.....	6,846	.....	.....	.....	.....	9,410
27	.....	.....	.....	.....	7,120	.....	.....	.....	.....	9,787
28	.....	.....	.....	.....	7,404	.....	.....	.....	.....	10,178
29	.....	.....	.....	.....	7,701	.....	.....	.....	.....	10,585
30	.....	.....	.....	.....	8,009	.....	.....	.....	.....	11,009

Table 3. - $4800 FORMULA A   All Formulas

Percentiles of active covered workers by synthesized monthly benefit amounts.

WITHOUT SOCIAL SECURITY

	WORKERS (THOU)	GINI INDEX	MEAN	PCT NBI benefit	10TH PCT	20TH PCT	25TH PCT	30TH PCT	40TH PCT	50TH PCT MEDIAN	60TH PCT	70TH PCT	75TH PCT	80TH PCT	90TH PCT
10 YEARS OF SERVICE															
ALL PLANS	19,419	.545	27	43						27	40	42	47	50	60
NONCONTRIBUTORY	15,368	.574	25	47						20	35	42	44	50	60
CONTRIBUTORY	4,051	.434	33	29				18	30	40	42	45	50	55	60
SINGLE EMPLOYER	13,880	.482	28	37					20	32	40	43	47	50	55
NONCONTRIBUTORY	10,104	.503	26	40						30	40	42	44	50	55
CONTRIBUTORY	3,777	.421	34	28				20	30	40	42	45	50	55	60
MULTIEMPLOYER	5,539	.683	22	58							20	37	42	50	75
NONCONTRIBUTORY	5,264	.687	22	59							17	36	42	50	75
CONTRIBUTORY	275	.602	27	44						25	30	43	43	49	60
MINING	190	.830	9	78											40
CONTRACT CONSTRUCTION	2,028	.686	23	59							18	42	44	56	75
MANUFACTURING	11,457	.479	27	37					20	30	40	42	45	50	55
NONDURABLE GOODS	4,273	.543	25	42						25	30	42	45	50	55
DURABLE GOODS	7,184	.440	28	34					25	35	42	44	50	50	45
TRANSPORTATION	1,656	.625	28	56							37	60	75	75	75
COMMUNICATION AND PUBLIC UTILITIES	1,454	.686	23	62								44	50	54	70
WHOLESALE AND RETAIL TRADE	1,280	.482	28	36					25	32	38	40	49	50	60
WHOLESALE TRADE	455	.515	29	37					16	32	33	40	50	60	66
RETAIL TRADE	825	.458	28	35					30	35	43	40	46	50	50
FINANCE, INSURANCE AND REAL ESTATE	806	.318	40	21			34	40	40	45	50	53	60	60	65
SERVICES	548	.708	19	55				40	40		16	22	30	40	50

WITH SOCIAL SECURITY

	WORKERS (THOU)	GINI INDEX	MEAN	PCT NBI benefit	10TH PCT	20TH PCT	25TH PCT	30TH PCT	40TH PCT	50TH PCT MEDIAN	60TH PCT	70TH PCT	75TH PCT	80TH PCT	90TH PCT
ALL PLANS	19,419	.82	177		150	150	150	150	150	177	190	192	197	200	210
NONCONTRIBUTORY	15,368	.81	175		150	150	150	150	150	170	185	192	194	200	210
CONTRIBUTORY	4,051	.79	183		150	150	150	168	180	190	192	195	200	205	210
SINGLE EMPLOYER	13,880	.76	178		150	150	150	150	170	182	190	193	197	200	205
NONCONTRIBUTORY	10,104	.75	176		150	150	150	150	150	180	190	192	194	200	205
CONTRIBUTORY	3,777	.78	184		150	150	150	170	180	192	192	195	200	210	210
MULTIEMPLOYER	5,539	.89	172		150	150	150	150	150	150	170	187	192	192	225
NONCONTRIBUTORY	5,264	.89	172		150	150	150	150	150	150	167	186	192	200	225
CONTRIBUTORY	275	.93	177		150	150	150	150	150	175	180	193	193	199	210
MINING	190	.48	159		150	150	150	150	150	150	150	150	150	180	190
CONTRACT CONSTRUCTION	2,028	.93	173		150	150	150	150	150	150	168	192	200	206	225
MANUFACTURING	11,457	.73	177		150	150	150	150	170	180	190	192	194	200	225
NONDURABLE GOODS	4,273	.77	175		150	150	150	150	150	175	180	197	195	200	205
DURABLE GOODS	7,184	.70	178		150	150	150	150	175	185	192	192	194	200	205
TRANSPORTATION	1,656	1.00	178		150	150	150	150	150	150	187	210	225	225	225
COMMUNICATION AND PUBLIC UTILITIES	1,454	.90	173		150	150	150	150	150	150	150	194	206	204	220
WHOLESALE AND RETAIL TRADE	1,280	.76	178		150	150	150	150	175	182	188	190	199	204	210
WHOLESALE TRADE	455	.83	179		150	150	150	150	166	182	183	190	200	216	216
RETAIL TRADE	825	.71	178		150	150	150	150	180	185	190	190	196	202	200
FINANCE, INSURANCE AND REAL ESTATE	806	.67	190		150	150	184	190	190	195	200	203	210	210	215
SERVICES	548	.79	169		150	150	150	150	150	150	166	172	180	190	200

Table 3. $4800 FORMULA A --Continued

Percentiles of active covered workers by synthesized monthly benefit amounts.

30 YEARS OF SERVICE

WITHOUT SOCIAL SECURITY

	WORKERS (THOU)	GINI INDEX	MEAN	PCT NO benefit	10TH PCT	20TH PCT	25TH PCT	30TH PCT	40TH PCT	50TH PCT MEDIAN	60TH PCT	70TH PCT	75TH PCT	80TH PCT	90TH PCT
ALL PLANS	19,419	.244	140	1	60	82	90	110	120	135	150	165	180	185	210
NONCONTRIBUTORY	15,368	.234	140	1	70	82	90	112	125	135	154	165	180	185	210
CONTRIBUTORY	4,051	.279	140	2	60	84	90	105	120	127	150	165	180	180	228
SINGLE EMPLOYER	13,880	.212	140	2	65	90	112	120	127	144	154	165	177	181	185
NONCONTRIBUTORY	10,104	.187	141	1	75	97	120	120	127	150	165	165	180	195	185
CONTRIBUTORY	3,777	.272	139	3	60	85	90	109	120	127	150	165	170	180	228
MULTIEMPLOYER	5,539	.307	140		60	75	90	78	91	120	150	180	191	215	227
NONCONTRIBUTORY	5,264	.304	140		60	75	75	78	90	120	144	180	191	217	217
CONTRIBUTORY	275	.355	153		30	75	75	91	120	132	165	180	185	210	300
MINING	190	.177	116		50	90	90	115	115	115	115	115	115	115	155
CONTRACT CONSTRUCTION	2,028	.314	132		60	60	72	75	90	108	126	150	180	210	243
MANUFACTURING	11,457	.210	128	1	67	75	90	99	120	120	144	157	165	165	180
NONDURABLE GOODS	4,273	.259	118	1	60	75	90	75	90	120	120	147	150	165	185
DURABLE GOODS	7,184	.174	134	1	75	96	120	120	127	133	150	165	165	165	180
TRANSPORTATION	1,655	.228	186	4	75	120	150	175	186	191	200	225	225	225	247
COMMUNICATION AND PUBLIC UTILITIES	1,454	.120	196		144	185	185	185	185	185	185	195	195	209	278
WHOLESALE AND RETAIL TRADE	1,280	.224	133		61	90	90	99	120	123	150	150	150	180	200
WHOLESALE TRADE	455	.252	133	1	60	90	92	99	99	120	144	180	180	185	240
RETAIL TRADE	825	.204	134		61	90	90	115	120	123	150	150	150	150	188
FINANCE, INSURANCE AND REAL ESTATE	806	.180	178	1	120	120	135	150	180	180	185	210	218	228	247
SERVICES	548	.344	118		48	60	60	72	78	90	110	120	150	150	217

WITH SOCIAL SECURITY

	WORKERS (THOU)	GINI INDEX	MEAN	PCT NO benefit	10TH PCT	20TH PCT	25TH PCT	30TH PCT	40TH PCT	50TH PCT MEDIAN	60TH PCT	70TH PCT	75TH PCT	80TH PCT	90TH PCT
ALL PLANS	19,419	.118	290		210	232	240	260	270	285	300	315	330	335	360
NONCONTRIBUTORY	15,368	.113	290		220	232	240	262	275	285	304	315	330	335	360
CONTRIBUTORY	4,051	.135	290		210	234	240	255	270	277	300	315	330	330	378
SINGLE EMPLOYER	13,880	.102	290		215	240	262	270	277	294	304	315	327	333	335
NONCONTRIBUTORY	10,104	.090	291		275	247	270	270	277	300	315	315	330	335	335
CONTRIBUTORY	3,777	.131	289		210	235	240	259	270	277	300	315	320	330	379
MULTIEMPLOYER	5,539	.149	290		210	225	225	228	241	270	300	330	341	365	397
NONCONTRIBUTORY	5,264	.147	290		210	225	225	228	240	270	294	330	341	367	397
CONTRIBUTORY	275	.179	303		180	225	225	241	270	282	315	330	335	360	450
MINING	190	.077	266		200	240	240	265	265	265	265	265	265	265	306
CONTRACT CONSTRUCTION	2,028	.147	282		210	210	222	225	240	258	276	300	330	360	393
MANUFACTURING	11,457	.097	278		217	225	240	249	270	277	294	307	315	315	330
NONDURABLE GOODS	4,773	.114	268		210	225	225	225	240	270	270	297	300	315	335
DURABLE GOODS	7,184	.082	284		225	246	270	270	277	283	300	315	315	315	330
TRANSPORTATION	1,655	.126	336		225	270	300	325	336	341	350	375	375	375	397
COMMUNICATION AND PUBLIC UTILITIES	1,454	.068	346		294	335	335	335	335	341	335	335	335	359	428
WHOLESALE AND RETAIL TRADE	1,280	.106	283		211	240	240	249	270	273	300	300	300	330	350
WHOLESALE TRADE	455	.118	283		210	240	242	249	249	270	294	330	330	335	390
RETAIL TRADE	825	.096	284		211	240	240	265	265	273	300	300	300	300	338
FINANCE, INSURANCE AND REAL ESTATE	806	.098	328		270	270	285	300	330	330	335	360	360	378	327
SERVICES	548	.151	268		198	210	210	222	228	330	260	270	300	330	387

Note: Data relate only to those private pension plans covering more than 25 participants for which the plan adminis-
trator filed a report with the Department of Labor's Labor Management Services Administration. The count of
workers covered by the plan relates to active workers covered in 1967. The plan provisions summarized were
those in the Department's files in mid-1969.

Table 4.

Estimated Final Monthly Earnings, Pension Benefits and Retirement Income of Workers Retiring after 10, 15, 20, 25, and 30 Years of Service with Career Average Earnings of $4,800, Mid-1969

Years of service	Final monthly earnings	Pension Benefit		Worker's Retirement income		Family retirement income 1/	
		Mean	Median	Mean	Median	Mean	Median
10----------	$ 474	$ 27	$ 27	$177	$177	$252	$252
15----------	519	58	63	208	213	283	288
20----------	566	90	85	240	235	315	310
25----------	615	115	111	265	261	340	336
30----------	667	140	135	290	285	365 2/	360 2/
			Percent of final monthly earnings				
10----------	100	5.7	5.7	37.3	37.3	--	--
15----------	100	11.2	12.1	40.1	41.0	--	--
20----------	100	15.9	15.0	42.4	41.5	--	--
25----------	100	18.7	18.0	43.1	42.4	--	--
30----------	100	21.0	20.2	43.5	42.7	--	--

Relationship of Pension Benefits and Retirement Income to the Lower budget needs for a Retired Couple in Urban Areas 3/

Years of service	Budget need (2,902 ÷ 12)	Pension Benefit		Worker's Retirement income		Family retirement income 1/	
		Mean	Median	Mean	Median	Mean	Median
				Percent of budget need			
10--------	$242	11.2	11.2	73.1	73.1	104.1	104.1
15--------	242	24.0	26.0	86.0	88.0	116.9	119.0
20--------	242	37.2	35.1	99.2	97.1	130.2	128.1
25--------	242	47.5	45.9	109.5	107.9	140.5	138.8
30--------	242	57.9	55.8	119.8	117.8	150.8 2/	148.8 2/

1/ Assuming that the wife received a social security benefit equal to one-half that of her husband.

2/ This is sufficient for the retired couple to maintain an intermediate budget ($4,192 ÷ 12 = $349.33 monthly).

3/ Based on Spring 1969 cost estimates by the BLS of three budgets for an urban retired couple.