

**INTEGRATION OF PRIVATE PENSION PLANS WITH
SOCIAL SECURITY***

ABSTRACT

Since the Internal Revenue Service updated its rules for integration of qualified pension plans (Revenue Ruling 71-446) nearly ten years ago, major changes have taken place in the structure of social security benefits.

The lack of a consensus as to what constitutes a good set of rules for integration is a reflection of the many existing social and political viewpoints on this subject. Recognizing that no technical work on integration can begin without certain social and political premises, the authors decided to proceed with just one set of viewpoints. The authors believe that a significant number of people having an active interest in integration would, in large measure, share these viewpoints. However, the paper should be technically useful whether or not a reader agrees with the premises.

The selected hypothesis focuses on the replacement of income for retiring employees on an after-tax basis. Section I of the paper describes the underlying principles of the hypothesis; Section II deals with the basic concept of integration that logically follows; and Sections III and IV address the theoretical concepts of income replacement and the development of the basic offset integration formulas. The balance of the paper discusses adjustments that would (or would not) have to be made for different types of benefit formulas, additional benefit provisions, or differing employee circumstances.

I. THE HYPOTHESIS

In a free economy, an individual's earnings are determined, for the most part, in the marketplace and represent an approximate measure of his perceived contribution to society. These earnings not only include current cash compensation but may also include benefits paid under some kind of deferred arrangement, such as a pension at retirement. An employer's

*Authors of this paper are Yuan Chang, John N. Feldtmose, Jeff Furnish, Michael J. Gulotta, Douglas M. Hodes, Frederic T. Lhamon, Lawrence N. Margel, Karen Mitchell, Stewart G. Nagler, A. Frederick Rohlfs, Jr., Donald E. Sanning, and Robert J. Schnitzer.

willingness to contribute toward future pension benefits is based on his desire to retain the current services of an employee. Retirement benefits, therefore, can be considered a deferred recognition of the employee's contribution to society during the years of employment. Thus, the benefits offer a way for an active member of the society to provide for himself and his family in retirement years.

In this paper, we assume that our national policy has encouraged this deferred recognition. If an individual receives his total compensation during his active years and does not maintain adequate savings, he may become a burden on the state during his retirement years.

Under this hypothesis, it can be argued that social policy should encourage an individual to maintain all or part of his preretirement standard of living after retirement by deferring some earnings from his active years. On the other hand, it probably is unnecessary for social policy to promote an increase in his standard of living upon retirement. The objective is to spread an individual's earnings from production during some forty years of employment over a span of some sixty or more years. This can be done in such a way that the individual suffers no abrupt financial discontinuity during the transition from an active to a retired life.

II. CONCEPT OF INTEGRATION

Regulations covering the integration of private pension plans with social security benefits have been based on a consideration of the benefit cost. The employer takes credit in the private plan for what is deemed to be his contribution to the total cost of the social security benefits. Revenue Ruling 71-446, in particular, follows this approach. It develops the integration limits by determining the average value of all social security benefits (for retirement, disability, and death) as a percentage of the primary (retirement) benefit. Half of the cost of all benefits is then attributed to the individual employee, and half to the employer. Under Revenue Ruling 71-446, the employer's portion of the cost of social security benefits is equivalent to $83\frac{1}{3}$ percent of the employee's primary social security benefit, or $37\frac{1}{2}$ percent of final earnings up to the employee's covered compensation level. (Covered compensation is defined as the average annual wage determined under the pre-1978 social security calculation method, assuming that the employee always earned maximum social security covered wages.)

Because the primary purpose of any pension plan, private or public, is to provide retirement income, an appropriate view is to disregard all ancillary benefits, such as death or disability, in determining maximum integration limits. Also, consistent with the income replacement hypoth-

esis, the division of social security benefit cost between employee and employer should not have any effect on retirement income levels or integration rules. The main focus should be on what combination of benefits provided under social security and the private plan is most effective in replacing income. The analysis in this paper focuses on a formula that relates benefits to final earnings and adjusts for social security benefits by a direct offset. This type of plan design approaches directly the concept of integration consistent with the basic hypothesis.

Other types of benefit formulas can only approximate the direct integration achieved through the final earnings, social security offset approach. If agreement can be reached on suitable integration limits for the offset case, it should be possible, by adding reasonable assumptions for other factors, to develop consistent limits for use with step-rate plans, defined contribution plans, and plans that base their benefits on other than final earnings.

III. CONCEPTS OF INCOME REPLACEMENT

Postretirement income from pensions, including social security benefits, should not be thought of as a replacement for preretirement gross income. The income to be replaced, in whole or in part, is the employee's spendable income just prior to retirement. We might define spendable income as gross final earnings reduced by those items that no longer apply or that change after retirement. Social security taxes and federal, state, and local income taxes are the most obvious items. Contributions to the private pension plan itself and expenses associated with employment (cost of commuting, tools, uniforms, etc.) might also be considered. However, because this paper seeks a broad, general solution to the integration problem, it is inappropriate to adjust for items that are not universally applicable, such as the work-related expense items and state and local taxes. Therefore, a practical definition of postretirement spendable income would be gross preretirement income reduced by social security taxes and federal income taxes. To the extent that work-related expenses and state and local taxes are applicable, this definition overstates the amount of postretirement income needed to maintain the level of spendable income enjoyed prior to retirement.

The hypothesis is that social policy concerning retirement income will not encourage an increase in an individual's standard of living immediately after retirement. Therefore, spendable income, as defined above, should be the upper limit for the total pension benefit, that is, private plan benefit plus social security benefit.

In developing a benefit formula to meet the spendable income replace-

ment objective, one must recognize that benefits from private pension plans are subject to income tax, while benefits from social security are not. That is, the upper limit, expressed in pre-tax terms, will exceed 100 percent of spendable preretirement income.

Table 1 develops the retirement income objectives discussed above over a broad range of gross earnings, using a replacement objective of 100 percent of spendable income. The assumptions are given in the table. Different assumptions for effective rates of federal income tax, year of retirement, or past rates of earnings would change the detail of the items but not their essential relationship. Spendable income, that is, gross income net of social security and federal income taxes, is shown in column 4. Spendable income expressed as a percentage of gross earnings is shown in column 5. These percentages decline as gross earnings increase—a logical by-product of our progressive income tax structure.

Social security benefits in dollars and as a percentage of gross income are shown in columns 6 and 7. These benefits decrease sharply as a percentage of gross earnings because of the nature of the social security benefit formula and the maximum earnings covered under the social security system. The private plan benefit, after social security offset and federal income taxes, needed to provide the balance of the 100 percent upper limit income replacement is shown in column 8. The required private plan benefit after social security offset but before income tax is shown in column 10.

Columns 11 and 12 show the total benefit to be provided by the private plan and social security both in dollars and as a percentage of final earnings. Although the pattern of the column 12 percentages is U-shaped (as a result of the combined effect of social security and federal income taxes on final earnings and private plan benefits), the percentages do not vary greatly.

The percentages in column 12 are those necessary in a private plan with a benefit formula of A percent of final earnings (FE) less 100 percent of the social security benefit (PIA), $A\%FE - 100\%PIA$, to produce the after-tax 100 percent upper-limit income replacement. A formula that comes close to reproducing the benefits shown in column 11 is $80\%FE - 100\%PIA$. This private plan benefit is shown in column 13. Column 14 shows the excess (positive number) or deficiency (negative number) of the approximate private plan formula benefit (col. 13) over the theoretical private plan benefit (col. 11).

As Table 1 shows, full replacement of spendable income is approximated by a formula that provides less than 100 percent of final earnings reduced by 100 percent of the social security benefit. This result should be con-

TABLE I
REPLACEMENT OF 100 PERCENT OF GROSS SPENDABLE INCOME

FINAL EARNINGS	PRE RETIREMENT				POSTRETIREMENT								
	Social Security Tax	Federal Income Tax	Spendable Income		Social Security PIA		Required Plan Benefit after FIT	Federal Income Tax	Required Plan Benefit before FIT	Total Required Theoretical Pre-Tax Retirement Income*		Total Pre-Tax Retirement Income* Using Private Plan Formula of (80% FE - 100% PIA)	
			Amount	Percent	Amount	Percent				Amount	Percent	Amount	Excess (+), Deficiency (-) over Required Income
			$[(1) - (2) - (3)]$	$[(4) \div (1)]$	(6)	$[(6) - (1)]$				$[(4) - (6)]$	FIT on (10)	$[(8) + (9)]$	$[(11) - (1)]$
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
\$ 7,000 ...	\$ 469	\$ 602	\$ 5,929	84.7%	\$3,897	55.7%	\$ 2,032	\$ 0	\$ 2,032	\$ 5,929	84.7%	\$ 5,600	-\$ 329
8,500 ...	570	882	7,048	82.9	4,355	51.2	2,693	0	2,693	7,048	82.9	6,800	- 248
10,000 ...	670	1,177	8,153	81.5	4,813	48.1	3,340	0	3,340	8,153	81.5	8,000	- 153
12,500 ...	838	1,723	9,939	79.5	5,577	44.6	4,362	10	4,372	9,949	79.6	10,000	51
15,000 ...	1,005	2,345	11,650	77.7	6,335	42.2	5,315	167	5,482	11,817	78.8	12,000	183
20,000 ...	1,340	3,599	15,061	75.3	7,542	37.7	7,519	629	8,148	15,690	78.5	16,000	310
25,000 ...	1,675	5,044	18,281	73.1	7,910	31.6	10,371	1,323	11,694	19,604	78.4	20,000	396
30,000 ...	2,010	6,654	21,336	71.1	8,086	27.0	13,250	2,197	15,447	23,533	78.4	24,000	467
40,000 ...	2,372	10,354	27,274	68.2	8,236	20.6	19,038	4,192	23,230	31,466	78.7	32,000	534
50,000 ...	2,372	14,542	33,086	66.2	8,236	16.5	24,850	6,816	31,666	39,902	79.8	40,000	98
75,000 ...	2,372	25,167	47,461	63.3	8,236	11.0	39,225	16,457	55,682	63,918	85.2	60,000	- 3,918
100,000 ...	2,372	35,792	61,836	61.8	8,236	8.2	53,600	27,082	80,682	88,918	88.9	80,000	- 8,918

* Private plan benefit plus social security benefit.

Assumptions: (a) 1985 retiree; (b) social security projection for wage base, 6 percent; CPI, 5 percent; (c) social security tax as projected by Social Security Administration; (d) salary increase, 6 percent; (e) state and local tax, none; (f) federal income tax: 1979 law, no adjustments; single exemption prior to retirement, double exemption after retirement; deduction is greater of standard deduction and 15 percent of final earnings.

trusted with the 1978 Treasury Department proposals, under which a 100 percent offset would have been permitted only if the formula provided at least 100 percent of final earnings.

IV. CONCEPTS OF PARTIAL INCOME REPLACEMENT

Few private pension plans aim to replace 100 percent of spendable income. Therefore, suitable integration limits should be developed where a company's objective is to provide less than 100 percent replacement. Suppose that an employer wishes to have his pension plan replace 75 percent of spendable income. This objective can be viewed as the benefit necessary, in combination with 100 percent of the social security benefit, to replace 75 percent of spendable income at all income levels. This method is referred to as "replacement of a percentage of gross spendable income." It provides the same percentage replacement of spendable income on an after-tax basis to all pensioners regardless of income level. If the tax on a 75 percent objective were proportional to the tax on a 100 percent objective, the approximate plan formula would be $75\%(80\%FE) - 100\%PIA = 60\%FE - 100\%PIA$. Because the tax is not proportional, the approximate formula is actually $57\%FE - 100\%PIA$. This development is shown in Table 2.

For illustrative purposes, Table 3 shows the development of benefits by a formula that provides 75 percent of the private plan benefit amount from the 100 percent replacement objective; that is, the private plan provides 75 percent of the difference between spendable income and the social security benefit. This method is referred to as "replacement of a percentage of net private plan income." The approximate plan formula would be $75\%(80\%FE - 100\%PIA) = 60\%FE - 75\%PIA$. This approach differs from that used by the Treasury Department in its 1978 integration proposals only in that it recognizes social security taxes and federal income taxes. The Treasury Department ignored the effect of taxes, while this approach adjusts for social security taxes and federal income taxes.

Using the "replacement of a percentage of net private plan income" method, it is difficult to design a private plan that will provide the same total retirement income replacement percentages at all earnings levels. Under this method, a benefit formula that provides adequate percentage replacement at the higher earnings levels will provide a greater relative benefit level for the lower earnings levels. A benefit formula that will provide adequate total retirement income at the lower earnings levels will not provide adequate benefits at the higher earnings levels. In practice, most formulas are designed to avoid inadequate benefits at any earnings level. Because most pension plans are aimed toward employees at the

TABLE 2
REPLACEMENT OF 75 PERCENT OF GROSS SPENDABLE INCOME

FINAL EARNINGS	PRERETIREMENT				POSTRETIREMENT								
	Social Security Tax	Federal Income Tax	Spendable Income		Social Security PIA		Required Plan Benefit after FIT	Federal Income Tax	Required Plan Benefit before FIT	Total Required Theoretical Pre-Tax Retirement Income*		Total Pre-Tax Retirement Income* Using Private Plan Formula of (57% FE - 100% PIA)	
			Amount	Percent	Amount	Percent				Amount	Percent	Amount	Excess (+), Deficiency (-) over Required Income
			{(1) - (2) - (3)}	{(4) - (1)}	{(6) - (1)}	{(0.75(4) - (6))}				{FIT on (10)}	{(8) + (9)}	{(6) + (10)}	{(11) - (11)}
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
\$ 7,000 ...	\$ 469	\$ 602	\$ 5,929	84.7%	\$3,897	55.7%	\$ 550	\$ 0	\$ 550	\$ 4,447	63.5%	\$ 3,990	- \$ 457
8,500 ...	570	882	7,048	82.9	4,355	51.2	931	0	931	5,286	62.2	4,845	- 441
10,000 ...	670	1,177	8,153	81.5	4,813	48.1	1,302	0	1,302	6,115	61.2	5,700	- 415
12,500 ...	838	1,723	9,939	79.5	5,577	44.6	1,877	0	1,877	7,454	59.6	7,125	- 329
15,000 ...	1,005	2,345	11,650	77.7	6,335	42.2	2,403	0	2,403	8,738	58.3	8,550	- 188
20,000 ...	1,340	3,599	15,061	75.3	7,542	37.7	3,754	0	3,754	11,296	56.5	11,400	104
25,000 ...	1,675	5,044	18,281	73.1	7,910	31.6	5,801	262	6,063	13,973	55.9	14,250	277
30,000 ...	2,010	6,654	21,336	71.1	8,086	27.0	7,916	716	8,632	16,718	55.7	17,100	382
40,000 ...	2,372	10,354	27,274	68.2	8,236	20.6	12,220	1,861	14,081	22,317	55.8	22,800	483
50,000 ...	2,372	14,542	33,086	66.2	8,236	16.5	16,579	3,252	19,831	28,067	56.1	28,500	433
75,000 ...	2,372	25,167	47,461	63.3	8,236	11.0	27,360	8,190	35,550	43,786	58.4	42,750	- 1,036
100,000 ...	2,372	35,792	61,836	61.8	8,236	8.2	38,141	15,656	53,797	62,033	62.0	57,000	- 5,033

* Private plan benefit plus social security benefit.

Assumptions: (a) 1985 retiree; (b) social security projection for wage base, 6 percent; CPI, 5 percent; (c) social security tax as projected by Social Security Administration; (d) salary increase, 6 percent; (e) state and local tax, none; (f) federal income tax: 1979 law, no adjustments; single exemption prior to retirement, double exemption after retirement; deduction is greater of standard deduction and 15 percent of final earnings.

TABLE 3

REPLACEMENT OF 75 PERCENT OF NET PRIVATE PLAN INCOME

FINAL EARNINGS	PRERETIREMENT				POSTRETIREMENT						
	Social Security Tax	Federal Income Tax	Spendable Income		Social Security PIA		Required Plan Benefit Net of FIT [0.75{(4) - (6)}]	Federal Income Tax [FIT on (10)]	Required Plan Benefit before FIT {(8) + (9)}	Total Theoretical Pre-Tax Retirement Income*	
			Amount [(1) - (2) - (3)]	Percent [(4) ÷ (1)]	Amount	Percent [(6) - (1)]				Amount	Percent [(11) ÷ (1)]
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
\$ 7,000 ...	\$ 469	\$ 602	\$ 5,929	84.7%	\$3,897	55.7%	\$ 1,524	\$ 0	\$ 1,524	\$ 5,421	77.4%
8,500 ...	570	882	7,048	82.9	4,355	51.2	2,020	0	2,020	6,375	75.0
10,000 ...	670	1,177	8,153	81.5	4,813	48.1	2,505	0	2,505	7,318	73.2
12,500 ...	838	1,723	9,939	79.5	5,577	44.6	3,272	0	3,272	8,849	70.8
15,000 ...	1,005	2,345	11,650	77.7	6,335	42.2	3,986	0	3,986	10,321	68.8
20,000 ...	1,340	3,599	15,061	75.3	7,542	37.7	5,639	229	5,868	13,410	67.1
25,000 ...	1,675	5,044	18,281	73.1	7,910	31.6	7,778	686	8,464	16,374	65.5
30,000 ...	2,010	6,654	21,336	71.1	8,086	27.0	9,938	1,208	11,146	19,232	64.1
40,000 ...	2,372	10,354	27,274	68.2	8,236	20.6	14,279	2,489	16,768	25,004	62.5
50,000 ...	2,372	14,542	33,086	66.2	8,236	16.5	18,638	4,030	22,668	30,904	61.8
75,000 ...	2,372	25,167	47,461	63.3	8,236	11.0	29,419	9,420	38,839	47,075	62.8
100,000 ...	2,372	35,792	61,836	61.8	8,236	8.2	40,200	17,177	57,377	65,613	65.6

* Private plan benefit plus social security benefit.

Assumptions: (a) 1985 retiree; (b) social security projection for wage base, 6 percent; CPI, 5 percent; (c) social security tax as projected by Social Security Administration; (d) salary increase, 6 percent; (e) state and local tax, none; (f) federal income tax: 1979 law, no adjustments; single exemption prior to retirement, double exemption after retirement; deduction is greater of standard deduction and 15 percent of final earnings.

average income level, the net replacement approach will result in formulas that provide total retirement income at the lower earnings levels that exceeds the 100 percent of spendable income objective.

V. ADJUSTMENTS FOR EMPLOYEES WITH LESS THAN A FULL
CAREER WITH ONE EMPLOYER

Adjustments to the social security offset must also be considered for an employee who is covered by more than one integrated pension plan during his career. Following the concepts of income replacement in Section III, we should use the full amount of the social security benefit as an offset on a collective basis. Each employer should be able to take a pro rata part of the employee's actual social security benefit and offset it against the employee's gross retirement income from that employer.

There are two practical obstacles to this theoretical approach:

1. The employee's actual social security benefit is not known until he retires. In many cases, however, the benefit from each employer must be determined long before that time.
2. The benefit payable to an employee from a private plan for service any time before retirement could be based on a salary many years before retirement. Using preretirement salary for a benefit calculation, in combination with a pro rata part of the actual social security benefit based on salary at retirement, may result in a very low, and perhaps inequitable, benefit.

It makes sense to base the social security benefit in the offset for an employer on the actual earnings with that employer. The solution, therefore, is to use a social security benefit in the offset for each employer so that an "equitable" net benefit from each employer results.

Two methods may be used to obtain the desired result:

1. *Total-service method.* Assuming that the employee's current rate of compensation continues from the date of severance to age 65, the social security benefit offset is calculated using actual compensation from this and all prior employers. This benefit is then multiplied by the ratio of service with this employer to total potential service to age 65 with all employers (past, present, and future).
2. *Current-employer method.* The social security benefit offset is calculated assuming that the employee has no prior employer earnings or earnings beyond the date of termination. The benefit resulting from this calculation is not prorated by service as in method 1.

Method 1 can be simplified by assuming that an employee's service to age 65 with all employers is forty years (years from earliest plan eligibility at age 25 up to age 65) or thirty-five years (the maximum countable years used in social security calculations).

Both methods require a benefit formula offset percentage that is independent of service (e.g., 50 percent). If a service-related unit offset (e.g., 2 percent per year) is used, then only method 1, but without the service prorate element, is an acceptable way of calculating the offset because the pro rata concept is included in the service-related unit offset.

Because of the nonlinear nature of the social security benefit formula, method 2 will yield offset amounts that are systematically higher than those produced by method 1 under all reasonable assumptions for future earnings. Method 2 may be a more practical choice, however, because prior earnings, obtained either from a retrieval of social security records or from some estimation technique, do not have to be used.

Estimation techniques can be discriminatory in the case of employees who have years of no earnings under social security, because these techniques attribute some earnings to those years. The result is the use of an offset that exceeds the actual social security benefit that the employee can receive. On the other hand, using the actual social security earnings history can result in the offset being calculated on earnings that are not covered under the pension plan itself. This could include overtime, shift differential pay, or earnings from second jobs. Consequently method 2, which uses only earnings with the employer sponsoring the plan, may be the preferable approach.

VI. OTHER CONSIDERATIONS

A. *Marital Status*

All the preceding analyses can be redeveloped recognizing the tax status of married employees, and including the spouse's social security benefit.

An income replacement objective for married employees that would be consistent with the upper-limit replacement objective outlined in Section III, would be a private plan benefit that, together with 150 percent of a married employee's social security benefit, would replace 100 percent of preretirement spendable income. For this situation, the private plan benefit should be a joint and two-thirds survivor annuity, to be consistent with the inherent joint and two-thirds survivor nature of the social security benefit for a married couple. The joint and two-thirds survivor private plan benefit would be defined as A percent of FE less the married couple's total social security benefit (including the spouse's benefit). Table 4 shows the formula development. An A percent value of 80 percent, which is the same percentage developed in the single-employee analysis, reasonably replaces the 100 percent upper limit of spendable income (col. 12).

If we define the private plan formula offset in terms of the married couple's social security benefit—not just the employee's social security

TABLE 4

MARRIED EMPLOYEE—REPLACEMENT OF 100 PERCENT OF SPENDABLE INCOME (PRIVATE PLAN FORMULA OFFSET
USES TOTAL MARRIED COUPLE PIA)

FINAL EARNINGS	PRE-RETIREMENT				POST-RETIREMENT								
	Social Security Tax	Federal Income Tax	Spendable Income		Couple's Total Social Security PIA [†]		Required Plan Benefit Net of FIT	Federal Income Tax	Required Plan Benefit [‡] before FIT	Total Required Theoretical Pre-Tax Retirement Income [‡]		Total Pre-Tax Retirement Income [‡] Using Private Plan Formula of (80% FE + 100% Married Couple PIA)	
			Amount	Percent	Amount	Percent				Amount	Percent	Amount	Excess (+), Deficiency (-) over Required Income
			[(1) - (2) - (3)]	[(4) ÷ (1)]	[(6) ÷ (1)]	[(8) - (6)]				[(10) ÷ (10)]	[(8) + (9)]	[(6) + (10)]	[(11) ÷ (11)]
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
\$ 7,000 ...	\$ 469	\$ 224	\$ 6,307	90.1%	\$ 5,846	83.5%	\$ 461	\$ 0	\$ 461	\$ 6,307	90.1%	\$ 5,600	-\$ 707
8,500 ...	570	454	7,476	88.0	6,533	76.9	943	0	943	7,476	88.0	6,800	- 676
10,000 ...	670	702	8,628	86.3	7,220	72.2	1,408	0	1,408	8,628	86.3	8,000	- 628
12,500 ...	838	1,152	10,510	84.1	8,366	66.9	2,144	0	2,144	10,510	84.1	10,000	- 510
15,000 ...	1,005	1,635	12,360	82.4	9,503	63.4	2,857	0	2,857	12,360	82.4	12,000	- 360
20,000 ...	1,340	2,745	15,915	79.6	11,313	56.6	4,602	0	4,602	15,915	79.6	16,000	- 85
25,000 ...	1,675	3,959	19,366	77.5	11,865	47.5	7,501	17	7,518	19,383	77.5	20,000	617
30,000 ...	2,010	5,241	22,749	75.8	12,129	40.4	10,620	563	11,183	23,312	77.7	24,000	688
40,000 ...	2,372	8,248	29,380	73.5	12,354	30.9	17,026	2,076	19,102	31,456	78.6	32,000	544
50,000 ...	2,372	11,903	35,725	71.5	12,354	24.7	23,371	3,952	27,323	39,677	79.4	40,000	323
75,000 ...	2,372	22,253	50,375	67.2	12,354	16.5	38,021	10,504	48,525	60,879	81.1	60,000	- 879
100,000 ...	2,372	32,878	64,750	64.8	12,354	12.4	52,396	20,255	72,651	85,005	85.0	80,000	- 5,005

* 150 percent of single life amount.

† Joint and two-thirds survivor annuity form.

‡ Private plan benefit (joint and two-thirds) plus married couple social security benefits.

Assumptions: (a) 1985 married retiree; (b) social security projection for wage base, 6 percent; CPI, 5 percent; (c) social security tax as projected by Social Security Administration; (d) salary increase, 6 percent; (e) state and local tax, none; (f) federal income tax: 1979 law, no adjustments; two exemptions prior to retirement, four exemptions after retirement; deduction is greater of standard deduction and 15 percent of final earnings; (g) spouse's social security benefit is 50 percent of employee's social security PIA.

benefit—the resulting rules for integrated benefits will differ by marital status. The design of other employee benefits (e.g., group life insurance) is influenced by marital status, and it would be equally correct to recognize marital status in the integration of pension benefits as well. However, there would be serious practical problems in applying rules that recognize the employee's marital status, which could change during employment and between termination and retirement.

As an alternative, the private plan benefit could be defined as A percent of FE less 100 percent of the employee's (i.e., excluding the spouse's) social security benefit. The resulting values of A percent are shown in Table 5, column 14. It should be noted that the private plan benefit in column 11, which is used to develop the total benefit in column 13, is the benefit before conversion to a joint and two-thirds survivor annuity. Reducing this private plan benefit (col. 11) for a joint and two-thirds survivor annuity option and for income taxes, and then adding the married couple's social security benefit, results in a total income equal to the 100 percent upper limit of spendable income.

Table 5 shows that for final earnings of \$30,000 and below, a private plan benefit of $80\%FE - 100\%PIA$ will produce an excessive benefit relative to a 100 percent upper-limit replacement objective (see cols. 15 and 16). However, such a private plan formula produces less income than required to maintain the preretirement living standard for those whose final earnings exceed \$30,000. Thus, additional integration would be necessary to attain the goal of providing a basically uniform percentage of final earnings to all employees from the combination of social security and private pension plan benefit.

Primarily because of practical considerations, it is appropriate to use the same formula for both single and married employees in determining integration rules.

B. Cost-of-Living Adjustments

In developing the appropriate integration parameters, we have not recognized the impact of inflation after retirement, primarily because of the difficulty in establishing appropriate assumptions and the historical precedent of ignoring inflation. If inflation continues at the rate of the past few years, further consideration might be given to such adjustments.

The effect of inflation on replacement ratios can be substantial. Social security benefits, of course, are indexed to the Consumer Price Index. Thus, they preserve the purchasing power provided at retirement and provide what might be called a constant, inflation-adjusted replacement ratio.

TABLE 5

MARRIED EMPLOYEE—REPLACEMENT OF 100 PERCENT OF SPENDABLE INCOME (PRIVATE PLAN FORMULA OFFSET USES EMPLOYEE'S PIA)

FINAL EARNINGS	PRERETIREMENT				POSTRETIREMENT								Total Pre-Tax Retirement Income [‡] Using Private Plan Formula of (80% FIE - 100% Employee's PIA)		
	Social Security Tax	Federal Income Tax	Spendable Income		Couple's Total Social Security PIA*		Required Plan Benefit [‡] after FTT	Federal Income Tax	Required Plan Benefit [‡] before FTT	Required Plan Benefit before Reduction for J&S Option	Employee's Social Security PIA (100%)	Total Required Theoretical Pre-Tax Retirement Income [‡]		Amount	Excess (+), Deficiency (-) over Required Income
			Amount	Percent	Amount	Percent						Amount	Percent		
(1)	(2)	(3)	[(1) - (2) - (3)]	[(4) + (1)]	[1.5(12)]	[(6) - (1)]	(4) - (6)]	(10]	[(8) + (9)]	[(10) - 0.8]	(12)	[(11) + (12)]	[(13) - (1)]	(15)	[(15) - (13)]
\$ 7,000 ...	\$ 469	\$ 224	\$ 6,307	90.1%	\$ 5,846	83.5%	\$ 461	\$ 0	\$ 461	\$ 576	\$3,897	\$ 4,473	63.9%	\$ 5,600	\$ 1,127
8,500 ...	570	454	7,476	88.0	6,533	76.9	943	0	943	1,179	4,355	5,534	65.1	6,800	1,266
10,000 ...	670	702	8,628	86.3	7,220	72.2	1,408	0	1,408	1,760	4,813	6,573	65.7	8,000	1,427
12,500 ...	838	1,152	10,510	84.1	8,366	66.9	2,144	0	2,144	2,680	5,577	8,257	66.1	10,000	1,743
15,000 ...	1,005	1,635	12,360	82.4	9,503	63.4	2,857	0	2,857	3,571	6,335	9,906	66.0	12,000	2,094
20,000 ...	1,340	2,745	15,915	79.6	11,313	56.6	4,602	0	4,602	5,753	7,542	13,295	66.5	16,000	2,705
25,000 ...	1,675	3,959	19,366	77.5	11,865	47.5	7,501	17	7,518	9,398	7,910	17,308	69.2	20,000	2,692
30,000 ...	2,010	5,241	22,749	75.8	12,129	40.4	10,620	563	11,183	13,979	8,086	22,065	73.6	24,000	1,935
40,000 ...	2,372	8,248	29,380	73.5	12,354	30.9	17,026	2,076	19,102	23,878	8,236	32,114	80.3	32,000	- 114
50,000 ...	2,372	11,903	35,725	71.5	12,354	24.7	23,371	3,952	27,323	34,154	8,236	42,390	84.8	40,000	- 2,390
75,000 ...	2,372	22,253	50,375	67.2	12,354	16.5	38,021	10,504	48,525	60,656	8,236	68,892	91.9	60,000	- 8,892
100,000 ...	2,372	32,878	64,750	64.8	12,354	12.4	52,396	20,255	72,651	90,814	8,236	99,050	99.1	80,000	- 19,050

* 150 percent of employee's PIA.

† After reduction for joint and two-thirds survivor option.

‡ Private plan benefit plus employee social security benefit.

Assumptions: (a) 1985 married retiree; (b) social security projection for: wage base, 6 percent; for CPI, 5 percent; (c) social security tax as projected by Social Security Administration; (d) salary increase, 6 percent; (e) state and local tax, none; (f) federal income tax: 1979 law, no adjustments; two exemptions prior to retirement, four exemptions after retirement; deduction is greater of standard deduction and 15 percent of final earnings; (g) spouse's social security benefit is 50 percent of employee's social security PIA; (h) joint and two-thirds survivor factor is 0.8.

Private pension plans use various methods to adjust for inflation, and different methods of recognizing inflation naturally would have different impacts on integrated pension plans:

1. If a private pension plan were indexed to the cost of living in the same way as social security, every employee would maintain a constant, inflation-adjusted replacement ratio, were it not for the effect of the progressive income tax structure. Thus, a plan that was properly integrated at retirement would remain so.
2. At the other extreme, if the private pension plan's benefits were never adjusted for inflation after retirement, then the replacement ratios would decrease with time. Lower-paid employees, because a greater proportion of their benefits are indexed social security benefits, would be relatively better off than higher-paid employees. Thus, it would not be possible for a pattern of replacement ratios that was basically uniform at retirement regardless of income level to become, a few years later, more favorable for higher-paid employees than for lower-paid employees. Consequently, if integration rules were to recognize the effect of inflation after retirement, higher levels of social security offset could be permitted.
3. For plans that fall between types 1 and 2 above (i.e., those that adjust benefits to reflect inflation partially), the reasoning in 2 applies.

Since the integration methods described do not adjust for inflation after retirement, no reduction in social security offsets should be required for plans that provide such postretirement increases.

VII. ADJUSTMENTS FOR ANCILLARY BENEFITS

The primary purpose of any retirement plan is to provide retirement income. Regulations outside the integration area have strict and objective limits requiring that survivor and disability benefits under the retirement plans be incidental in nature. Therefore, the inclusion of these benefits in a retirement program should not be used to change the analysis of retirement income replacement. These benefits should be subject to separate integration tests on a benefit-by-benefit basis.

VIII. ADJUSTMENTS FOR EARLY RETIREMENT

Thus far, the development of maximum integration limits has been based on the assumption that retirement income begins at age 65. Under offset plans, as under other plans, benefits may be reduced for early income commencement. The reduction in the gross benefit, that is, the benefit prior to the social security offset, has no effect on integration. However, the reduction applied to the maximum 100 percent social security offset must be large enough to ensure that the amount of the reduced offset is

not greater than the actuarial equivalent of the 100 percent offset applicable at age 65. For example, a plan providing 80%FE – 100%PIA at age 65 could provide no greater offset at age 62 than 80 percent of PIA (the actuarial equivalent of 100 percent of PIA at age 65) regardless of the reduction applied to the 80 percent of FE gross benefit.

This requirement will also be met if the offset is not applied until age 65, regardless of the age at income commencement. The gross benefit would be paid prior to age 65 and would reflect the plan's early retirement reduction factors.

The approaches described above are both consistent with the integration limit adjustment requirements stated in the currently applicable Revenue Ruling 71-446.

IX. EMPLOYEE CONTRIBUTIONS

Under this approach to income replacement, no adjustments have to be made for employee contributions. Employee contributions are solely a means of cost sharing and have no bearing on formula design. This can be seen by realizing that the employer could, at the same cost, provide a lower income replacement objective on a noncontributory basis. For example, if the initial formula is 60%FE – 100%PIA, and if the accumulated employee contributions are equivalent to a 5 percent of FE benefit, then the equivalent noncontributory plan formula of equal employer cost is 55%FE – 100%PIA.

Because the deduction of the full social security benefit could result in no plan benefit being payable to lower-paid employees, the integration rules would have to provide for minimum benefits that had an actuarial value equivalent to accumulated employee contributions. This would be no different from requiring the inclusion of a death benefit equal to these accumulated contributions.

X. INTEGRATION OF FINAL EARNINGS STEP-RATE EXCESS PLANS

The type of plan discussed in this section is of the following form: X percent of final earnings plus Y percent of final earnings in excess of a breakpoint. The rules described below for the integration of final earnings step-rate excess plans are consistent with the principles developed for the integration of offset plans.

A. Breakpoint

The most suitable integration level, or breakpoint, is the employee's maximum average indexed monthly earnings (AIME) at age 65, determined by his date of termination or retirement. This is a logical definition

of the integration level because it is the amount on which the employee's social security benefits are or would be based. A table of maximum AIME values can be developed each year for all applicable years of birth, assuming no future increases in the taxable wage base or in average covered wages beyond the year of exit.

If a breakpoint lower than the maximum AIME were used to determine the value of Y (the plan benefit percentage of final earnings in excess of the breakpoint, which is equivalent to the percentage of final earnings up to the breakpoint provided by the social security PIA), then Y would be a larger number, given social security's weighted PIA formula. This, in turn, would result in total retirement benefits (private plan plus social security) that increase as a percentage of final earnings as final earnings increase up to the maximum AIME, and then gradually decline as a percentage of final earnings as final earnings increase beyond the maximum AIME. Such a pattern probably would be considered to produce prohibited discrimination in favor of high-paid employees.

If a breakpoint higher than the maximum AIME were used to determine the value of Y , in such a way that the total retirement benefits at the breakpoint level of final earnings met the plan's income replacement objectives, then the total benefits at lower pay levels would exceed those objectives. The lower the pay, the greater would be the degree of excess over the income replacement objective at the integration level. While this might not prevent qualification of the plan, it could produce an unacceptable plan design.

These situations can be illustrated by the following examples. Assume that the maximum AIME is \$15,000 and that the PIA at that level is \$6,000 (40 percent). Assume that the PIA for an AIME of \$10,000 is \$5,000 (50 percent). Let us look at the total retirement income at four pay levels—\$10,000, \$15,000, \$20,000, and \$25,000—using each of the first three amounts as the integration level and devising the benefit formula to produce total income of 80 percent of pay at the integration level.

Case I: Integration level is \$15,000. Plan benefit formula is
 $40\%FE + 40\%(FE - \$15,000)$

Final Earnings	Plan Benefit	Social Security	Total Income	% of FE
\$10,000	\$ 4,000	\$5,000	\$ 9,000	90%
15,000	6,000	6,000	12,000	80
20,000	10,000	6,000	16,000	80
25,000	14,000	6,000	20,000	80

Case II: Integration level is \$10,000. Plan benefit formula is
 $30\%FE + 50\%(FE - \$10,000)$

Final Earnings	Plan Benefit	Social Security	Total Income	% of FE
\$10,000	\$ 3,000	\$5,000	\$ 8,000	80%
15,000	7,000	6,000	13,000	87
20,000	11,000	6,000	17,000	85
25,000	15,000	6,000	21,000	84

Case III: Integration level is \$20,000. Plan benefit formula is
 $50\%FE + 30\%(FE - \$20,000)$

Final Earnings	Plan Benefit	Social Security	Total Income	% of FE
\$10,000	\$ 5,000	\$5,000	\$10,000	100%
15,000	7,500	6,000	13,500	90
20,000	10,000	6,000	16,000	80
25,000	14,000	6,000	20,000	80

B. Determining the Benefit Payable on Excess Earnings

Y percent is the percentage of final earnings in excess of the breakpoint to be provided by the private plan. To be consistent with the income replacement objectives described in Section III, Y should not exceed the percentage of pay up to the breakpoint provided by primary social security benefits. In 1982 the maximum social security benefit for a wage earner retiring at age 65 will be approximately 45 percent of his AIME. In coming years, the ratio of the social security benefit to the maximum AIME will decrease and will ultimately level off at about 35 percent.

The value of Y percent should be either 35 percent, the ultimate rate, or 40 percent, the average of the current and ultimate rates. The 40 percent rate is used in the remainder of this report because it is more consistent with expectations in the near term.

The general formula for a maximally integrated step-rate excess plan for a career employee would then be X percent of final earnings plus 40 percent of final earnings in excess of maximum AIME.

C. Determining the Benefit Payable on Joint Earnings

The percentage of total final earnings provided by the plan should be permitted to take on any value from zero upward. The practical upper limit should be the value that, when combined with the benefit on excess earnings and the social security benefit, produces a replacement objective of 100 percent of preretirement spendable income (see Sec. III).

The offset plan formula for this 100 percent upper limit replacement of

spendable income is $80\%FE - 100\%PIA$. The corresponding formula under a step-rate excess plan is $40\%FE + 40\%(FE \text{ in excess of maximum AIME})$. Combined plan and social security benefits are identical under the two plans for a participant whose final earnings are at least as high as the maximum AIME. Similarly, if a plan sponsor provides for a 75 percent replacement objective, the plan formula can be either an offset formula of $57\%FE - 100\%PIA$ or a step-rate excess formula of $17\%FE + 40\%(FE \text{ in excess of maximum AIME})$. Again, the results are identical for participants with final earnings in excess of AIME.

As in an offset plan, a step-rate excess plan will provide benefits for some lower-paid employees that, when combined with social security, represent a replacement rate higher than that for higher-paid employees. For example, if X percent equals zero, all employees with final earnings below the breakpoint will receive only social security benefits, which represent more than 40 percent of final earnings, while very high-paid employees will receive total retirement benefits equal to 40 percent of final earnings.

D. Adjustment for More than One Integrated Plan

To produce the most equitable results for an employee who is covered by more than one integrated plan during his career, Y percent should be apportioned so that each employer can take credit for only that part of the employee's social security benefit attributable to his service with that employer (see Sec. V). If the total service assumption of forty years is used, then Y percent can be defined as 1 percent per year of service (40 percent divided by 40 years). If an employee terminates before age 65, the AIME is computed using prior social security wage bases, assuming no further changes in taxable wage base or average covered wages (see total-service method and related discussion in Sec. V).

Of course, an individual covered for twenty years under each of two employers' identical plans will have different benefits than if he had worked forty years for the same employer. The differences arise from the use of two different final earnings amounts and AIME amounts.

E. Adjustments for Employee Contributions

If employee contributions are a level percentage of pay for all participants, it is appropriate to ignore them in determining the plan formula under a step-rate excess plan because, under such a plan, employee contributions merely result in a portion of the X percent being provided by the employees rather than by the employer.

If employee contributions are required only on pay in excess of some breakpoint (usually the taxable wage base), or are at a higher rate on such

excess pay, some basis may exist for permitting a higher value of *Y* percent than for a noncontributory plan. The analysis in this paper, however, is based on replacement of income by benefits, not on the cost allocation of these benefits. Since these excess-only employee contributions are only a means of cost sharing, they also can be disregarded. This approach is consistent with that recommended for offset plans (Sec. IX).

F. Adjustments for Different Breakpoints

If a plan sponsor wants to use a breakpoint greater than the maximum AIME, then *Y* percent must be multiplied by a fraction whose numerator is the maximum AIME and whose denominator is the desired breakpoint. If no change is made to the value of *X* percent, benefits payable to employees with final earnings below the original breakpoint will remain the same and benefits payable to higher-paid employees will be lower than under the original formula. If *X* percent is increased by the number of percentage points by which *Y* percent has been reduced, benefits payable to employees with final earnings above the new breakpoint will be identical with those derived from the original formula, while lower-paid employees will receive higher benefits than before.

Using the same assumptions as in the examples in Section A above, it is possible to test the effect of this technique for adjusting the value of *Y* and, possibly, of *X*. Use as a starting point the formula in Case I: 40%FE + 40%(FE - \$15,000). If the plan sponsor uses an integration level of \$20,000, *Y* must be reduced to 30 percent (\$15,000 divided by \$20,000 times 40 percent). If *X* remains at 40 percent, the resulting benefits are as follows:

Final Earnings	Plan Benefit	Social Security	Total Income	% of FE
\$10,000	\$ 4,000	\$5,000	\$ 9,000	90%
15,000	6,000	6,000	12,000	80
20,000	8,000	6,000	14,000	70
25,000	11,500	6,000	17,500	70

If the percentage points by which *Y* is decreased (10) are added to the value of *X* (producing *X* = 50), the resulting benefits would be as follows:

Final Earnings	Plan Benefit	Social Security	Total Income	% of FE
\$10,000	\$ 5,000	\$5,000	\$10,000	100%
15,000	7,500	6,000	13,500	90
20,000	10,000	6,000	16,000	80
25,000	14,000	6,000	20,000	80

If an employer wants to use a breakpoint lower than the maximum AIME for each participant (e.g., by "freezing" one year's table or by using the AIME for the oldest current employee), then the use of a higher value of *Y* percent would not be permitted. If such an increase in *Y* percent were permitted, combined plan and social security benefits for participants with final earnings above the lower breakpoint would be a higher percentage of final earnings than for lower-paid participants, as illustrated in Case II of the examples in Section A above. This would result in prohibited discrimination, and, therefore, the plan would not satisfy IRS qualification requirements.

XI. INTEGRATION OF CAREER-PAY PLANS

Under career-pay plans, benefits are related to an employee's compensation throughout his career rather than reflecting only the compensation near retirement. Many career-pay plans, therefore, use larger benefit percentages than those used by corresponding final-pay plans. In addition, since career-pay plans may not work properly in an inflationary environment, many employers periodically update the accrued benefits to adjust for the erosion of benefits since the plan's inception or the last updating.

In developing the criteria for integration of career-pay plans with social security, two types of plans have been considered (the first is the limiting case of the second):

1. The excess plan, where benefits are granted only on earnings in excess of a stated compensation level.
2. The step-rate excess plan, where benefits are granted on all earnings, but a higher rate of benefit accrual applies to earnings in excess of a stated compensation level.

Section III of this paper proposed a practical upper-limit replacement objective of 100 percent that would provide replacement ratios of 35-45 percent of average indexed monthly earnings (AIME), or about 1 percent per year of service for a full career (see Sec. X, B and D). In translating these percentages from a final-pay basis to a career basis, inflation has been ignored, on the assumption that its impact would be countered by periodic updatings.

The underlying growth rate of real wages is the remaining economic component needed to develop the integration percentages for career-pay plans in relation to final-pay plans. For example, using 2 percent as the noninflationary wage growth rate and using each year's maximum AIME as the wage breakpoint (also assumed to increase 2 percent per year), an excess benefit of 1.4 percent can be substantiated, based on a forty-year career (see Appendix I). In other words, 1.4 percent of the sum of the

yearly AIME amounts over forty years reproduces the full primary social security benefit, assuming 2 percent real wage growth. If the noninflationary wage growth rate were assumed to be higher than 2 percent, or if an inflationary rate were used, the resulting excess benefit would be greater than 1.4 percent.

The yearly maximum AIME is the AIME for someone aged 65 in the year in question, assuming that compensation was always at or above the taxable wage base. The use of AIME as the breakpoint for career-pay plans permits a better comparison with final-pay plans and also reduces plan design problems created by the recent ad hoc increases in the taxable wage base.

If higher breakpoints, such as the taxable wage base, were used, the excess benefit percentage would have to be reduced proportionately so that no more than the full primary social security benefit would be reproduced by the sum of the products of the excess benefit percentage and the breakpoints over a forty-year career. However, the use of breakpoints lower than AIME would not serve to increase the 1.4 percent, since the sum of the products of the excess benefit percentage and the breakpoints over a forty-year career would produce maximum primary social security benefits at an inappropriately low earnings level. For example, an individual whose earnings had been at or near this lower breakpoint would be fully integrated with maximum social security benefits, when in fact his actual social security benefits will be less than the maximum.

XII. INTEGRATION OF DEFINED CONTRIBUTION PLANS

In developing integration limits for career-pay plans, a percentage was derived that would, when applied to the sum of the yearly breakpoints, equal the maximum primary social security benefit at retirement in a noninflationary economy. To develop comparable integration limits for defined contribution plans, two additional factors must be considered:

1. The noninflationary investment rate of return, which is assumed to be 3 percent.
2. The actuarial present value at retirement of the primary social security benefit, based on a single-life annuity value assumed to be approximately \$12 per \$1 annual income (1971 Group Annuity Mortality Table 3 percent).

To achieve comparability with the 100 percent upper-limit replacement objective used with final-pay plans, the maximum integration target for defined contribution plans should be the actuarial present value of the maximum social security benefit. Following the approach used to develop the integration limits for career-pay plans, a percentage was derived that, when applied to each year's AIME over a full career, produces a lump-sum amount equivalent to the actuarial present value of the maximum

social security benefit. Using 2 percent as the assumed noninflationary rate of salary growth and 3 percent as the noninflationary rate of investment return, a maximum integration level of 9.9 percent can be supported (see Appendix II).

To the extent that inflation occurs and salary and AIME increase at rates greater than 2 percent, the inflationary component of the investment return should be a compensating factor. (Such automatic compensating factors are not present in career-pay plans, and the plan sponsor would have to update the plan periodically to counter the effects of inflation.)

For the reasons stated in Section XI for career-pay plans, the use of wage breakpoints higher than AIME would have to be accompanied by proportional reductions in the integration limit. If wage breakpoints lower than AIME are used, no increases in the integration limit should be allowed.

XIII. SUMMARY OF BASIC INTEGRATION PRINCIPLE

This paper proposes a single theoretical basis for the integration of qualified pension benefits with social security retirement benefits and examines the implications of that proposal. The authors of this paper have adopted the hypothesis that qualified retirement benefits represent a nationally sanctioned deferral of potential earnings, which are intended to provide a continuance of "standard of living" at normal retirement when added to social security retirement benefits.

The paper is not meant to address the relative merits of this hypothesis. Rather, by utilizing replacement of spendable income at retirement as the appropriate measure of standard of living, it develops integration rules that are simple, internally consistent, and logical for all major "styles" of integration. Furthermore, the paper finds that the rules developed under this hypothesis are not affected by inflation or the existence of ancillary death benefits. The rules are affected minimally by the existence of employee contributions and early retirement provisions.

It should be noted that there is a major question that cannot be resolved satisfactorily under this hypothesis. How should social security benefits be attributed to individual employers when employees earn pension benefits from more than one retirement plan? Resolution of this problem is believed to depend on acceptance of a second hypothesis that is directly relevant to that question only. Nevertheless, by demonstrating alternative practical solutions to that question, this paper shows that solving the problem of allocating social security benefits between employers should not damage the integration rules derived under the basic hypothesis of this paper.

APPENDIX I

DEVELOPMENT OF INTEGRATION LIMIT FOR CAREER-PAY PLANS

Let

Final pay % = 1% ; p = Wage growth = 2% ; $Y\%$ = Career pay % .

Then

$$Y\% \times \frac{S_{40}}{40} = \text{Final pay \%} \times (1 + p)^{35} \times \frac{S_{35}}{5}$$

$$Y\% \times (1.510) = 1\%(2.000)(1.041) ;$$

$$Y\% = 1.38\% .$$

APPENDIX II

DEVELOPMENT OF INTEGRATION LIMIT FOR
DEFINED CONTRIBUTION PLANS

Let

p = Wage growth = 2% ;

J = Investment return = 3% ;

$\bar{a}_{65} = 12$;

PIA = 40% AIME ;

$Z\%$ = Excess integration percentage .

Present value of PIA at retirement

= Present value at retirement of $Z\%$ applied to each year's AIME.

or

$$[40\% \text{ AIME}(1 + p)^{40}] \bar{a}_{65} = \sum_{t=0}^{39} Z\% \text{ AIME}(1 + p)^t (1 + J)^{40 - t - 1/2} ;$$

$$\begin{aligned} Z\% &= \frac{40\%(1 + p)^{40} \bar{a}_{65}}{(1 + J)^{39/2} \sum_{t=0}^{39} \left(\frac{1 + p}{1 + J} \right)^t} \\ &= \frac{0.40(2.208)(12)}{3.214(33.280)} = 9.91\% . \end{aligned}$$



DISCUSSION OF PRECEDING PAPER

WILLIAM H. BLAKE, JR:

The authors make a useful contribution to the policy debate on integration by introducing the income replacement hypothesis. Using this hypothesis, they make a reasonable case for deducting 100 percent of the participant's social security benefit from his total retirement income needs in determining the amount that must be provided from sources other than social security. However, they overlook the fact that in the United States sources of retirement income other than social security traditionally include both qualified pension plans and personal savings. The half of each participant's social security benefit that is derived from contributions made from employees' after-tax income is properly a deduction from the retirement income that is provided from the participant's own savings and not from employer-provided benefits under the qualified pension plan. Thus, the income replacement hypothesis leads to the conclusion that a plan should be allowed to offset 50 percent of the participant's social security benefit, not 100 percent as stated in the paper. Consistent with the authors' conclusion that integration should be approached on a benefit-by-benefit basis, the same 50 percent offset can be derived from the present $83\frac{1}{3}$ percent offset limit by removing the value of ancillary benefits; that is, by dividing $83\frac{1}{3}$ percent by the 162 percent assumed to represent the ratio of the value of all social security benefits to the value of retirement benefits.

KENNETH A. STEINER:

The authors have written a thought-provoking paper. At the very least, they should be congratulated for their exhibition of teamwork. Readers of the *Transactions* will recognize numerous similarities between the authors' paper and the paper "Social Security Integration" (*TSA*, XXVIII [1976], 287-320), in which Arthur Anderson developed alternative integration limits based on a proposed integration hypothesis that, in his opinion, better expressed the intent of section 401(a)(5) of the Internal Revenue Code.

Prior to this paper, members of the profession were generally aware that "spendable income analysis" was an extremely helpful tool in the design of employee benefit plans because such analysis provides plan sponsors with a logical measure of an employee's financial needs in the

event of death, disability, or retirement. This analysis also shows the extent to which benefits from all sources (social security, the sponsor, and the employee) provide for these needs in the event of such occurrences.

The authors have proposed that this tool be used as the theoretical basis for the integration of qualified pension benefits with social security benefits and as a substitute for the basis underlying the current integration rules. There are three problems with the authors' proposal:

1. It is practically impossible to reach a consensus as to what constitutes an individual's "preretirement spendable income." By using the same basic approach outlined in the authors' paper with minor modification of the assumptions used to develop preretirement spendable income, it is relatively easy to reach conclusions substantially different from those reached by the authors.
2. The integration limits developed in the paper are not necessarily consistent with the authors' hypothesis in that these limits would not prevent total pension benefits (private plan benefits plus social security benefits) from exceeding preretirement spendable income.
3. While proclaimed by the authors as "simple," the integration rules proposed easily could be more complicated than current rules.

In Section I the authors state: "If an individual receives his total compensation during his active years and does not maintain adequate savings, he may become a burden on the state," and "it can be argued that social policy should encourage an individual to maintain all or part of his preretirement standard of living." We have already seen, however, through enactment of IRC section 415 and recently enacted cutbacks in maximum allowable qualified plan benefits, contributions, and integration limits for defined contribution plans, as well as the imposition of additional qualification requirements for "top-heavy plans," that there are limits on how much "encouragement" Congress is willing to provide higher-paid members of our society to replace their preretirement standards of living. The enactment of such legislation would make it appear that Congress is not too concerned that higher-paid individuals will become "a burden on the state." Congress has, I believe, assumed that these individuals will accumulate sufficient personal savings, in addition to savings accumulated through qualified plan programs, to enable them to avoid spending their retirement at the local welfare office.

By developing a "practical" definition of preretirement spendable income as "gross preretirement income reduced by social security taxes and federal income taxes," the authors have developed a 100 percent replacement objective for single employees that resembles a shallow, U-

shaped curve starting at 84.7 percent replacement of final earnings at the \$7,000 earnings level, "bottoming" at 78.4 percent replacement at the \$25,000–\$30,000 earnings level, and presumably increasing to nearly 100 percent of gross earnings at the very high earnings levels. In contrast, if one were to define preretirement spendable income as gross income less federal, state, and social security taxes, work-related expenses, and savings, one might develop a deeper U-shaped curve starting at 78 percent replacement at \$7,000, decreasing to 73 percent at \$10,000, 66 percent at \$15,000, 60 percent at \$30,000, and bottoming at about 56 percent for compensation between \$50,000 and \$100,000 before gradually increasing to nearly 80 percent at the very high earnings levels.¹ The deeper slope of the curve for earnings levels under \$50,000 results from the assumption that disposable income for higher-paid individuals will be reduced to a much greater extent by preretirement savings than will the disposable income for lower-paid individuals. While 15 percent of gross income reduced by federal, state, and local taxes may appear to be a high savings rate to assume, it is important to recognize that the individuals being considered are 64 years old and probably have paid off their mortgage and have finished paying for the education of their children.

By modifying the definition of preretirement spendable income in such a manner, one can see from Table 1 of this discussion that a defined benefit plan formula of 55 percent of final five-year average earnings less 50

TABLE 1
REPLACEMENT OF SPENDABLE INCOME
(55 Percent of Final Five-Year Average Earnings
less 50 Percent of *PIA*)

Gross Compensation (1)	100% Replacement Objective [% of (1)] (2)	Social Security (3)	Amount Needed from Plan [(2) - (3)] (4)	Plan Benefit* (5)	Difference [(5) - (4)] (6)
\$ 7,000	\$ 5,460 (.78)	\$3,897	\$ 1,563	\$ 1,490	\$ (73)
10,000	7,300 (.73)	4,813	2,487	2,505	18
15,000	9,900 (.66)	6,335	3,565	4,200	635
30,000	18,000 (.60)	8,086	9,914	10,692	778
50,000	28,000 (.56)	8,236	19,764	20,440	676
100,000	56,000 (.56)	8,236	47,764	44,998	(2,766)

* Assuming 6 percent pay increases for five years preceding retirement.

¹ Assuming state taxes of 15 percent of federal income tax, work-related expenses of 6 percent of disposable income (defined as gross income less federal, state, and social security taxes), and savings of 0 percent of disposable income at \$7,000, 3 percent at \$10,000, 12 percent at \$30,000, and 15 percent at \$50,000 and above.

percent of the social security benefit will come close to replacing the newly defined preretirement standard of living at all pay levels.

Following the authors' approach, this would suggest that an offset of 50 percent of the social security benefit—not 100 percent—be the limit for integrated offset plans.

If one were to take the next logical step and consider preretirement savings as a *source* of retirement income, one might, depending on the amount of savings assumed, discover that the percentage of final compensation required to replace preretirement spendable income for high-paid employees from a sponsor's plan may be only slightly greater than the percentage required for lower-paid employees. In this case, using the authors' approach, the conclusion would be that little or no offset should be permitted.

While the authors conclude that a 100 percent social security benefit offset is permissible, the foregoing shows how tenuous this conclusion can be; minor modifications of the basic assumptions used to develop preretirement spendable income can produce results that could be used to justify practically any level of offset.

The authors state that "the main focus [in establishing integration rules] should be on what combination of benefits provided under social security and the private plan is most effective in replacing income"; that "it probably is unnecessary for social policy to promote an increase in [an individual's] standard of living upon retirement"; and that "spendable income [as defined in the paper] should be the upper limit for the total pension benefit, that is, private plan benefit plus social security benefit." By discovering that a plan formula of 80 percent of final earnings less 100 percent of social security approximately replaces their definition of preretirement spendable income, the authors appear to conclude that the maximum offset should be 100 percent of the social security benefit.

If a 100 percent maximum limitation were adopted, would it then be permissible to provide a benefit of 90 percent of final earnings less 50 percent of social security? If a negotiated plan provided monthly benefits of \$20 per year of service, would such a benefit be permitted under the author's proposed integration rules? From the statements in the paragraph above, the answers would appear to be no, because such benefits, together with benefits provided by social security, would provide higher postretirement standards of living for most plan participants. While such formulas appear to be permissible under the authors' rules, they are clearly inconsistent with the authors' stated hypothesis.

In Section II the authors claim that "because the primary purpose of any pension plan, private or public, is to provide retirement income, an

appropriate view is to disregard all ancillary benefits, such as death or disability, in determining maximum integration limits." However, in Section VII they claim that "these benefits should be subject to separate integration tests on a benefit-by-benefit basis," implying that perhaps the spendable-income-analysis approach also could be used to develop separate integration tests for ancillary benefits. The authors, however, have not suggested how these tests would work or how the proposed integration limits would be adjusted as a result of the tests. As a practical matter, if spendable-income-analysis tests for death and disability were adopted, how would the authors deal with the problems presented by employee needs that vary with age and family composition?

The authors also imply that there would be no need to adjust integration limits for postretirement benefit options or for benefit formulas that use final earnings instead of final three- or five-year average earnings. It is not difficult to see how such a lack of restrictions could result in discrimination in favor of the prohibited group.

Depending on adjustments that might be required for ancillary benefits or postretirement benefit options, in light of the above, it is conceivable that the integration rules proposed by the authors could be just as complicated, if not more complicated, than the current rules.

In summary, while spendable income analysis is definitely a valuable tool in the design of employee benefit plans, its use as a "single theoretical basis for integration of qualified pension plans with social security" falls significantly short of providing rules that are, in the authors' words, "simple, internally consistent, and logical for all major styles of integration."

(AUTHORS' REVIEW OF DISCUSSION)*

Mr. Blake's comments ignore the concept that social security is retirement income and that the development of integration rules based upon some contrived relationship between FICA taxes and benefits is inappropriate. It is not the source of financing of the benefit that is relevant. What is relevant is the level of retirement income being provided by social security.

Mr. Steiner seems to believe that public policy regarding integration should be based on the presumption of certain levels of savings at various income levels. As the authors clearly indicate in the paper, conditions that are not universally applicable were not considered in the analyses as a simplification in finding workable integration rules. Mr. Steiner does not

* Authors of this paper are Yuan Chang, John N. Feldtmose, Jeff Furnish, Michael J. Gulotta, Douglas M. Hodes, Frederic T. Lhamon, Lawrence N. Margel, Karen Mitchell, Stewart G. Nagler, A. Frederick Rohfs, Jr., Donald E. Sanning, and Robert J. Schnitzer.

provide, nor are the authors aware of, a generally accepted definition of savings, reliable data concerning savings levels over time at various pay levels, or a basis for determining what percentage of savings can be translated into retirement income.

Mr. Steiner also misinterprets our approach of analyzing the replacement of 100 percent of preretirement disposable income as requiring that employers not be permitted to provide benefits in excess of this level. There was no intent that this be the case. The authors' intent is that integration rules should not mandate income replacement over 100 percent.

The authors also wish to reiterate that our approach involves integration on an individual benefit-by-benefit basis and implies 100 percent offset for death and disability benefits. Rules for integration of retirement income benefits would not require any adjustment for such ancillary benefits.

Finally, Mr. Steiner indicates that the permitted use in benefit formulas of final earnings instead of final three- or five-year earnings easily could result in discrimination in favor of the prohibited group. However, it should be clear that no adjustments are needed; even under present rules, offset plans are not restricted from providing any desired level of gross benefit.