

# Earnings-Replacement Rate of Old-Age Benefits, 1965-75, Selected Countries

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*This study is about the earnings replacement rate of the old-age benefit for the average worker in manufacturing who had average earnings throughout his career. It updates previously published data for earlier years and compares the replacement rate of the combined social security and private pension benefits for selected countries, in an attempt to show what a more complete benefit package might be. The study also traces what has happened to the replacement rate during the decade beginning in the mid-1960's. In several countries the intent has been to raise social security benefits over a period of time to a level sufficient to permit a retired worker to maintain his previous standard of living. The study looks to see if such policies have succeeded in reaching these goals, especially in view of the economic turbulence—recession and inflation—during the 1970's.*

IN THE MARCH 1970 issue of the BULLETIN, a standard for comparing old-age benefit levels on an international basis was presented.<sup>1</sup> The data in that article, based on 1969 figures, were subsequently updated. The calculations in both instances were based on the career of an average worker in manufacturing who had average earnings throughout his career. Annual wage data were derived from the *Yearbook of Labor Statistics* of the International Labor Organization (ILO). The wage records for each country were then indexed for inflation by the country's own method and the national formula applied to the revalued wage record to calculate the benefit. The same methodology has been used for the current study to produce replacement rates for the 11-year period 1965-75 and to see what had happened to old-age benefits during those years.

In six of the 12 countries studied, 40 years of work are required. Five of the countries require fewer than 40, and the Netherlands requires more

(table 1). Clearly, the intent of the countries studied was to raise the relative level of benefits, and much social and political pressure was exerted in that direction. In response to pressures, formula changes and other improvements were legislated.

These modifications occurred primarily before 1974, after a period of extended prosperity and more than full employment in Western Europe.<sup>2</sup> The economic atmosphere was optimistic, and such innovations as a flexible retirement age were counted upon to provide adequate benefits several years before the usual statutory retirement age, as a reasonable alternative to the regular old-age pension. In view of the general optimism of the period thus expressed in social security legislation, the data developed in this study might have been expected to show a rising replacement rate for most countries during 1965-73.

The world recession and inflation, beginning with the oil crisis of 1973-74, created serious problems in the financing of social security programs for many countries. Despite these problems, social security benefits in some countries have advanced at a faster pace than usual. The increases have not necessarily translated into higher replacement rates, however.

To understand this phenomenon, it may be useful to consider how inflation affects the replacement rate. The rate expresses the relationship between the amount of the pension and current average earnings. If earnings increase at a faster rate than benefits, the replacement rate decreases.

One major determinant of the pension level in the earnings-related system is the concept of "former earnings," as defined in the pension formula. Earnings based on many years (lifetime earnings in some of the countries) unless revalued—that is, upgraded by given factors to eliminate

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<sup>1</sup> Max Horlick, "The Earnings Replacement Rate of Old-Age Benefits: An International Comparison," *Social Security Bulletin*, March 1970, see also the December 1974 *Bulletin*, pages 44-45

<sup>2</sup> Most of the countries had insufficient manpower and imported foreign labor. In West Germany, almost 3 million workers, or one ninth of the total labor force, were foreign, almost one third of the Swiss labor force was foreign.

TABLE 1 — Replacement rate of social security old-age pensions for men with average earnings in manufacturing, selected countries<sup>1</sup>

[Retirement as of Jan 1 of year indicated]

Country	Years worked	Pension as percent of earnings in year before retirement											
		Single worker						Aged couple					
		1965	1969	1972	1973	1974	1975	1965	1969	1972	1973	1974	1975
Austria	40	67	65	63	62	61	54	67	65	63	62	61	54
Canada <sup>2</sup>	40	21	22	27	30	31	39	42	39	42	46	48	57
Denmark	40	30	29	30	30	30	29	51	42	44	44	43	43
France	37 5	49	42	44	47	44	46	65	56	60	62	60	60
Federal Republic of Germany	40	48	56	49	49	49	50	48	56	49	49	49	50
Italy	40	60	67	65	67	64	67	60	67	65	67	64	67
Netherlands	50	35	36	35	38	37	38	50	51	50	53	53	54
Norway	40	25	34	37	39	40	41	38	49	51	53	54	55
Sweden	30	31	39	45	45	50	59	44	52	58	57	62	76
Switzerland	Since 1948	28	26	31	39	35	36	45	42	46	58	53	53
United Kingdom <sup>3</sup>	Since 1961	23	21	22	22	22	26	36	33	34	33	33	39
United States	Since 1951	29	29	34	38	36	38	44	44	50	57	54	57

<sup>1</sup> Data are for systems at maturity. For Norway and Sweden, data reflect less than-mature earnings-related pensions. For Denmark, employment-related pension, which is still not payable in full, and for Canada, pension

that reached maturity in 1975

<sup>2</sup> Based on April rather than January flat rate benefits in 1973, 1974, and 1975 for Canada and in 1975 for the United Kingdom

the effect of inflation—tend to be low in relation to current income and therefore result in a low replacement rate (Both inflation and lower earnings during the early years of a career are factors here) A formula based on a relatively short period—the highest 5 or the highest 3 years of earnings, for example—would still be influenced by inflation, but to a lesser degree

Other factors may also make a difference. This study is based on pensions received at the beginning of the year, for example, except for the United Kingdom. In that country, the modified social security system introduced in April 1975 raised the replacement rates 2 and 3 percentage points for single pensioners and married couples, respectively.

At one time, the policy goal in many countries was for pensions to replace about 40–50 percent of earnings. Over the years, national discussions indicate that expectations have increased so that, currently, 60–66½ percent of earnings is considered necessary to maintain the previous level of living. The data developed in this study lead to the conclusion that few countries had attained this goal by 1975.

The 12 countries selected for the study include those with the most advanced social security systems and for which the best statistical data are available. They represent three different approaches toward income maintenance for the aged: The two-tier benefit system, the earnings-related approach, and the flat-rate benefit. A

comparison is thus possible of the relative size of benefits by type of system. The variety of approaches to social security pensions has resulted in a gap between countries with the highest and lowest replacement rates.

In the Canadian, Norwegian, and Swedish two-tier structures, the first tier is a flat-rate monthly pension nominally paid to all residents reaching retirement age.<sup>3</sup> Some qualifications may, in fact, limit the “universality” of this pension. The flat-rate “demogrant” was at one time counted on to provide a basic level of protection for the recipient. As expectations and the demands on the pension system increased, however, the level of benefits was found to be inadequate. Consequently, an earnings-related layer, covering wage and salary workers as well as the self-employed, was added in the 1960’s.

A maturing period was scheduled, with benefits gradually building up for a number of years.<sup>4</sup> Consequently, in the early years the earnings-related system paid only a small fraction of the eventual benefit. This pattern is reflected in low but increasing replacement rates. Denmark adds an employment-related pension to its universal, flat-rate benefit, but the supplement is based on length of coverage rather than level of earnings.

<sup>3</sup> For details, see Social Security Administration, Office of Research and Statistics, *Social Security Programs Throughout the World, 1975* (Research Report No 48), 1976.

<sup>4</sup> Full benefits were not paid for 10 years in Canada, 30 years in Sweden, and 40 years in Norway.

Most of the other countries in the study use an earnings-related formula exclusively. The Netherlands is the major exception. There, the flat-rate benefit was scheduled at a relatively higher level than were the flat-rate benefits in the above examples and still continues to be the only benefit paid.

Data for private pensions, discussed in detail below, have been included in the study for the first time in order to get a more complete picture of income maintenance for the retired worker. Table 2 shows the replacement rate and other characteristics of private pensions in five countries. The tabulation on page 14 shows the effect on the total replacement rates in these countries when private pensions are added to the public benefits.

#### Average Worker and Average Pension

The conceptual problems involved in establishing the definition of the "average worker" were dealt with in detail in the earlier study of replacement rates.<sup>6</sup> Briefly, the work history of the "average worker" in this study is based on earnings figures for men working in manufacturing, published by the ILO.

The average pension was computed for each country and year according to the pension formula in effect at the time, using the above earnings figures. Restraints on earnings for pension purposes (the upper limits of covered earnings) were observed, although in most countries the average wage fell well within these limits.

It was assumed that the average man working in manufacturing would have retired at the beginning of the year. The benefit for a single pensioner and for a couple was measured against earnings in the year before retirement. Men in manufacturing generally earn about 25 percent more than the general average for covered workers.

This concept may tend to understate the replacement rate in some systems. In the Netherlands, for example, the flat-rate benefit of a highly paid worker in manufacturing would represent a smaller proportion of his take-home pay than it would for the lower-paid worker. Under a purely

TABLE 2—Replacement rate and other characteristics of private pensions in 5 countries, 1975

Country	Percent of working population covered	Pension			Pension as percent of earnings	
		Vested	Portable	Indexed	1975	At maturity
Federal Republic of Germany	60	Yes	Yes	No	12-22	12-22
France	80	Yes	Yes	No	8	19
Netherlands	80	Yes	Yes	No	7-11	7-11
Sweden	60	Yes	Yes	No	6	10
United Kingdom	45	No	No	No	23	23

<sup>1</sup> Actual percentage may be somewhat higher.

<sup>2</sup> Old law. A 1975 law that provides for vesting has not been implemented.

earnings-related formula, the amount of earnings would make no difference in the replacement rate as long as the amounts credited were below the ceiling. Under a weighted benefit formula (United States) or a two-tier system (Canada and Scandinavia), the lower the wage, the higher the replacement rate. The reason for the differences is that the weighted formula and the flat-rate universal benefit make up a larger proportion of the low earner's income than of the high earner's. Conversely, the higher the wage the lower the replacement rate. Since a worker in manufacturing would have wages about 25 percent above average, he would have a replacement rate below the average of all covered workers.

#### REPLACEMENT RATES IN 1975

Replacement rates in 1975, as well as for the period 1965-74, are shown for 12 countries in table 1 for single beneficiaries and for couples. Where a dependent spouse does not receive a supplement—as in Austria, the Federal Republic of Germany, and Italy—the replacement rates, of course, are the same for both categories. When originally planned, the formulas for those countries were intended to provide a benefit high enough to support a family of two. In the other countries, a supplement of 50 percent of the husband's benefit usually is payable to the dependent wife. In the Scandinavian countries, where eligibility is based on residence rather than income, a spouse customarily receives half the combined basic amount payable to a married aged couple.

In 1975 the replacement rate for couples varied from 76 percent in Sweden to 39 percent in the

<sup>6</sup> See the definition section, pages 11-12.

United Kingdom Among the 12 countries, the United States is at the top of the middle group (clustered around 54-57 percent) In three countries the replacement rates were 65 percent or higher, in seven countries they were 50-57 percent, and in the two remaining countries they were below 50 percent

Replacement rates for single beneficiaries in 1975 ranged from 67 percent in Italy to 26 percent in the United Kingdom The countries that do not provide a supplement for a dependent spouse, along with Sweden, offer the highest replacement rates—ranging from one-half to two-thirds of previous earnings The intent was to provide income for a married couple No reduction is made in the benefit for a single worker, however, or for a worker who does not have a surviving spouse Four other countries are clustered around the U S replacement-rate level, two are lower, and five are higher In other words, benefits in the United States are in the middle range here also (36-41 percent)

An examination of these data raises the question of why 12 countries whose goal is similar—a replacement rate of 60-66 percent of past earnings—show significant variations from each other for 1975<sup>6</sup> Any explanation should take into account the structure of the old-age pension formulas as well as general economic trends

One of the primary reasons for the discrepancy in rates is the difference in the methods used to compute earnings in order to calculate benefits If the formula does not call for a revaluation of previous earnings, then time becomes a paramount element The longer the period of earnings taken into account, the lower the career average will be because a pattern of continually increasing wages has prevailed since World War II Thus, if the benefit is 60 percent of earnings and the formula is based on a time period that includes several years in the past, the pension is bound to be a smaller percentage of current earnings

A similar, although less severe, effect may occur when earnings are calculated for a shorter period In the Federal Republic of Germany, for example, past earnings for pension purposes are

<sup>6</sup>The official statements and laws of the individual countries give their benefit goals with respect to earnings-replacement rates

counted for the first 3 of the last 4 years before retirement During an inflationary period the level of earnings used for computing benefits would therefore be lower than the level at the time of retirement, as a result of the built-in lag Thus, although the formula provides that a pensioner with 40 years' coverage should receive a pension equal to 60 percent of earnings, the built-in delay causes a reduction of 10 percentage points (almost 17 percent) in the replacement rate, lowering it to 50 percent

The French formula is based on the average of the highest 10 years of earnings, with past earnings indexed up to a level about equal to or slightly higher than current levels The replacement rate figures for 1974 and 1975 reflect unusually large wage increases in 1973 and 1974, respectively They are therefore relatively lower than might be expected from the benefit formula

The Italian pension formula in 1975 aimed at replacing 75 percent of the pensioner's earnings during the best 3 years in the last 5 before retirement, if the retiree had 40 years' coverage (In 1976, this rate was increased to 80 percent of the best 2 years of the highest 3 in the decade before retirement) Past earnings are not revalued, however, and the pension is thus diminished

Time is a factor also in the two-tier systems because the earnings-related layers are in the process of maturing<sup>7</sup> The rate of maturity—that is, the number of years required to build up a full pension—differs from country to country Generally speaking, the newer the provisions, the smaller the benefits accrued The Swedish and Norwegian systems still require several years to reach full benefit payments The Canadian system reached maturity in 1976 Where this maturing process continues, the benefit will, of course, improve from year to year. The replacement rate may still go down, however, if current earnings rise more rapidly than benefits

Some comment should be made on the systems with the lowest replacement rates The United Kingdom's pension program has undergone a number of changes In 1975, that country had a

<sup>7</sup>It is common for a social insurance system to pay reduced benefits for the first years of operation 20 years may be required for a full benefit After 5 years the benefit amount is 5/20 of the full benefit, after 6 years, 6/20, etc

flat-rate benefit Before that date, flat-rate pensions in addition to earnings-related supplements were payable

For 1975, the difference between the replacement rates of Denmark and Sweden is striking Both countries provide a basic and a supplementary pension Although the basic Danish pension (financed from general revenue funds) would be adequate in conjunction with a sizable supplementary pension like the one in Sweden, Denmark's commitment to a supplementary pension in the past has been minimal in terms of contributions and benefits consequently are relatively low

### Trends, 1965-75

It is logical to divide the period 1965-75 into two periods Before the world recession starting with the oil crisis and after that time A study of all 12 countries for the entire period serves to show what has actually happened over the longer period

In the 12 countries studied, the 1975 replacement rates, compared with those for 1965, had increased in nine countries for couples as well as for single pensioners The rate dropped for single pensioners in three countries, for aged couples it was smaller in two countries and remained unchanged in one

As indicated earlier, most of the countries had a pension objective built into their formulas, with a specific goal expressed in terms of former earnings It was anticipated that, when the system matured and paid full benefits, the objective would have been reached The original planners generally did not consider a rapid increase in inflation, nor an extended recession These situations did occur, however, and exerted a negative effect on the planned growth in replacement rates

The countries that appear to have been most successful not only devised the best methods of adjusting benefits to counteract inflation, but by instituting supplementary pension programs also ensured that benefits would steadily increase in relation to earnings over a period of several years

Although the replacement rate has not progressed in many of the countries studied, neither has it advanced as far as it might have in the

absence of inflation This situation is particularly true in countries with a lagging formula where the unadjusted earnings used as a base for computing pensions are several years in the past In the Federal Republic of Germany, for example, the rate has remained considerably below what is called for in the formula (50 percent, rather than 60 percent), as pointed out earlier On the other hand, the German system is enhanced by crediting the earner annually with a coefficient that relates his earnings to the national average wage (like the "pension point" system in Sweden) \*

The methods used to index earnings and benefits have also been important in coping with inflation Tying benefits to a price or wage index, revaluing former earnings, the pension-point system, etc In 1968, Italy switched from using career earnings to a method based on average earnings during the last 3 years before retirement The result of this change is apparent in the replacement-rate increase from 1965 to 1969 Social security benefits in the United States have been tied to the consumer price index (CPI) since 1975 Although the old method of ad hoc changes appears to have kept up with the price index in the long run, the pensioner gains from the tie-in to the CPI because benefits are increased at more frequent intervals during inflationary periods

Where the social security pension is computed on the basis of lifetime earnings, benefits would be relatively low unless past earnings were adjusted for subsequent wage and price increases In France, for example, lifetime earnings of new pensioners are adjusted for each year by factors established annually As a result, former annual earnings have in many cases attained a higher value than earnings posted in the year of retirement, and benefits have maintained their value during the inflationary period The 1974 break in the upward movement of the French replacement rate from 1972 to 1975 was caused by an unusually large wage increase in that year If wages had followed the normal pattern the rate would also have risen in 1974 because the pension

\* For a more detailed analysis, see Elizabeth Kreitler Kirkpatrick, *Protecting Social Security Beneficiary Earnings Against Inflation: The Foreign Experience* (Staff Paper No 25), Social Security Administration, Office of Research and Statistics, 1977

formula called for gradual increases through 1975

The "pension point" method, developed in Sweden in 1960 (and subsequently adopted by Norway), is in many ways the simplest and most efficient method now in use for relating lifetime earnings to pension benefits. Points that relate the value of annual earnings to a reference base are credited to the individual's social security earnings record every year and made inflation-proof by a tie-in to the consumer price index. This method eliminates the need for a revaluation of past earnings by averaging the number of points earned by the end of the working career.

The establishment of the supplementary earnings-related pension in Canada, Norway, and Sweden has succeeded in raising the replacement rate. Typically, the earnings-related pension began modestly and the first eligible pensioners had only minimal coverage, but the amount of the benefit has been increasing steadily year by year. It reached the planned maximum in Canada in 1976 and is scheduled to rise for several more years in Norway and Sweden. In these countries, the earnings-related benefit already rivals the basic pension. The replacement rate may thus be expected to increase steadily until maturity and then stabilize.

The result of special ad hoc increases is illustrated by the experience in Switzerland. Originally, benefits were examined every 5 years for appropriate ad hoc adjustments. In 1967, this schedule was changed to every 3 years. Since that time, periodic adjustments have been greater than called for by either the price or the wage index in an attempt to bring the replacement rate closer to adequacy and to lower the number of persons requiring assistance payments.

Where the replacement rate has not changed significantly, one explanation is that no pertinent modification of the formula has occurred. In the Federal Republic of Germany, neither the formula nor the indexing system has changed basically since 1965. The formula is based on average lifetime earnings and, because of the relatively low level of inflation in the period, recent wage or price fluctuations have had less effect on the rate. The high 1969 replacement rate is associated with a smaller-than-usual increase in 1968 average wages.

In Denmark, the replacement rate has remained virtually the same since 1969 because only one of the two tiers is automatically adjusted. The universal pension, which makes up a major part of the total benefit, is index related (tied to a price index). The earnings-related pension (dependent on the length of coverage rather than the level of earnings) is subject to ad hoc changes, and the rates have been changed only once since the inception of this tier in 1965.

Replacement-rate changes of one or two percentage points from one year to the next are generally within the normal, expected range. Wages and benefits do not move in a parallel manner. One year wages may rise a little more, the next year benefits may rise. Unusually large wage or benefit changes may, however, cause considerable fluctuations in the rate from year to year. The decline of seven percentage points in the Austrian replacement rate from 1974 to 1975, for example, was caused primarily by a sudden large jump in wages.

### Austria

*Formula*—The social security pension formula is based on the average of the last 5 years of earnings (or the highest 60 consecutive months after age 44). Recorded earnings are revalued for changes in national average earnings. The pension amount is primarily time-related. A basic pension amounting to 30 percent of earnings is supplemented by 0.6 percent per year for the first 10 years of coverage, 0.9 percent per year for the next 10 years, 1.2 percent for each of the following 10 years, and 1.5 percent for the next 15 years. The pension replaces 57.0 percent of average earnings during the 5-year base period for 30 years' coverage, 64.5 percent after 35 years, and 72.0 percent with 40 years' coverage. A maximum of 79.5 percent coverage is provided after 45 years.

*Characteristics affecting replacement rate*—The replacement rate under this type of formula suffers when wages are accelerating, because the benefit is calculated on the average of a 5-year period. This use of averaging explains the drop in the 1975 replacement rate shown in table 1. At the beginning of the 1970's, wages increased by 12-14 percent annually, maintaining a replace-

ment rate of 60–62 percent for the workers with 40 years' coverage. In 1974, wages suddenly increased by almost 30 percent, causing a drop of 6 percentage points in the replacement rate for 1975. As noted earlier, the program does not provide a supplement for a dependent spouse.

## Canada

*Formula*—A universal flat-rate pension and an earnings-related component make up the social security pension in Canada. The universal pension is payable when certain residence requirements are fulfilled. In 1976 the earnings-related pension reached its planned maximum—25 percent of average covered earnings—after year-to-year increases since its inception in 1966.

*Characteristics affecting replacement rate*—The Canadian replacement rate shows a greater growth than that of any other country studied. A steady upgrading of the universal pension and the planned, annual increases in the earnings-related pension have resulted in a year-to-year gain in relation to earnings, aided by the fact that wage inflation during the early 1970's was at a relatively modest rate. The larger-than-usual increase in the replacement rate from 1974 to 1975 is explained by a combination of modest wage increases and sizable jumps in the benefit levels—46 percent in the earnings-related segment and 12 percent in the flat-rate benefit.

In 1976, when the earnings-related benefit reached 25 percent of covered earnings, the Canadian old-age pension program was expected to attain its goal of replacing about 60 percent of former earnings.

## Denmark

*Formula*—A two-tiered social security pension system incorporates a universal flat-rate pension, based on residence, and a pension related to employment. Either pension requires 40 years of covered work to reach the maximum amount, although 27 years' coverage is sufficient for a full employment-related pension during a transitional period.

*Characteristics affecting replacement rate*—In contrast to supplementary pension programs in

other Scandinavian countries, the employment-related component in Denmark is tied to the number of years covered rather than the level of earnings. As a result, earners covered for the same length of time receive identical pensions, regardless of the level of their former earnings.

The employment-related pension is modest, compared with the universal pension benefit. It has had relatively little effect on the replacement rate.

## Federal Republic of Germany

*Formula*—The German benefit formula provides 15 percent of the worker's assessed wages for each year of coverage. The replacement rate figures in table 1 are based on a career of 40 years of covered employment. Assessed wages represent the ratio of a worker's earnings to the national average over the period of coverage, multiplied by the current "general computation base." The latter is changed each year in response to the average of the national wage level in the three preceding calendar years.<sup>9</sup>

*Characteristics affecting replacement rate*—Because it is usually assumed that West Germany has one of the better social security old-age pension systems (in terms of the pension amount it provides), the relatively low replacement rate for couples may seem puzzling. A twofold reason explains this situation. First, the pension is calculated on an average not of the final year, but of 3 years before retirement. The pension is thus permanently diminished in relation to current earnings, especially during an inflationary period. Second, the absence of a spouse's supplement, which, in some countries, adds one-half or more to the rate for single persons. The replacement rate has remained steady during the 1970's, indicating a relatively constant increase in wages from year to year.

## France

*Formula*—Pensions are payable in France at age 60, with 37.5 years of covered earnings needed.

<sup>9</sup> For further details, see Max Horlick, "Earnings Index and Old-Age Benefits in West Germany," *Social Security Bulletin*, March 1977.

for a full pension. At age 60 a full pension is 25 percent of the individual's average earnings based on the 10 highest income years. Pensions deferred until after age 60, however, increase by five percentage points per year. At age 65, the benefit thus amounts to 50 percent of average covered earnings, and at age 70 it is 75 percent. In computing the pension, former earnings are revalued to reflect current wage changes. The 1975 regular and deferred pension levels outlined above represent the achievement of goals that were approached in steps over several years.

Most workers retire at age 65 in France. The pension, according to the formula, may be increased by 50 percent for a dependent spouse aged 65 or older, but this supplement is subject to a rather low maximum. For the average worker in manufacturing it amounts to 40 percent.

*Characteristics affecting replacement rate*—The drop in the replacement rate from 1973 to 1975 resulted from unusually large increases in earnings. Under normal circumstances, in view of constantly improving pensions, the rate would have shown a steady year-to-year increase until 1975.

## Italy

*Formula*—The old-age pension is 1.85 percent of average earnings during the highest 3 of the last 5 years of work, multiplied by the number of years of coverage up to a maximum of 40. (Beginning 1976, the pension rate was increased to 2 percent of the highest 3 years of the last 10 years of work.)

*Characteristics affecting replacement rate*—Because inflation has pushed wages up year by year during the period covered here, the income considered for computing the pension has lagged approximately 2 years behind current income levels. This lag explains why the replacement rates shown in table 1 are lower than the 74 percent yielded by the formula, on the basis of 40 years' coverage. Still, the rate in Italy, at 64–67 percent of current earnings, is high by international standards.

Pensions are revalued automatically once a year according to cost-of-living changes. A dependent spouse does not receive a pension supplement.

## The Netherlands

*Formula*—Fifty years of contributions (ages 15 through 64) are nominally required for a full flat-rate pension. The benefit amount is reduced by 2 percent for each year of unexcused noncontribution but is the same for all pensioners fulfilling the basic requirements.

*Characteristics affecting replacement rate*—Pensions are adjusted automatically twice a year for changes in the wage index. This adjustment normally would have produced a constant replacement rate. The fact that the replacement rate has increased from 1965 to 1975, however, actually reflects a temporary tie-in to the price index during a period when prices have increased more rapidly than wages.

A supplement for the dependent spouse is provided by the program. This supplement increases the pension amount by approximately 40 percent, in comparison with the single pensioner's benefit.

## Norway

*Formula*—The pension consists of a universal pension (based on residence) and a graduated supplement (based on years of covered earnings). A full universal pension requires 40 years' residence with proportionate reductions for shorter periods. The full earnings-related pension is based on 40 years of earnings; the 20 years of highest earnings are used to compute the pension, again with proportionate reductions for shorter coverage. Special transitional provisions make a full earnings-related pension payable, however, after 20 years (in 1987), 21 years (in 1988) etc., until full maturity is reached in 2007. The goal of the pension system is to replace about two-thirds of previous earnings. In 1975 a new retiree received eight-twentieths of the earnings-related pension.

*Characteristics affecting replacement rate*—The steadily increasing replacement rate is accounted for in part by the maturing of the earnings-related pension, which ensures a year-by-year pension increase. Also influential has been the effort of Norwegian authorities during the last few years to increase pensions at a more rapid pace than earnings. The universal pension component makes the replacement rate of low earners greater than that for high earners.

## Sweden

*Formula*—The social security old-age pension program consists of a universal pension (available to resident citizens) and a graduated supplement (based on earnings). Sweden, unlike Norway, pays the universal pension in a standard amount to those who qualify and does not vary it with the number of years of coverage. The supplementary pension normally matures in 30 years, but by current transition rules it may be payable in full after 20 years' coverage (in 1980), thereafter increasing year by year until the full 30-year maturity is reached in 1990. In 1975, new retirees received fourteen-twentieths of the full earnings-related pension.

*Characteristics affecting replacement rate*—The considerable increase in the replacement rate during the period 1969-75 stems from the maturing of the earnings-related pension program that causes an automatic annual increase in benefits. A 5.5-percent permanent increase in the universal benefit for single pensioners (about 11.0 percent for couples) and the regular increases related to changes in the consumer price index were the primary causes of the large jump in the replacement rate from 1974 to 1975.

## Switzerland

*Formula*—At the beginning of 1975, a full pension amounted to 400 Swiss francs a month, plus 1.67 percent of average annual earnings.<sup>10</sup> To receive a full pension, a worker must contribute in all years from age 21 (or since 1948, when the system was started) to retirement at age 65. Shorter periods of contributions reduce the pension proportionately. A supplement for a dependent wife, payable at age 60, increases the pension amount by 50 percent. The social security old-age pension is subject to absolute minimum and maximum amounts, however. It is reviewed every 3 years, or earlier if a change of eight percentage points in the consumer price index occurs.

*Characteristics affecting replacement rate*—From 1972 to 1973 both the fixed and earnings-related portions of the Swiss social security pension increased substantially. In 1974, the pension

<sup>10</sup> As of Dec 31, 1974, 1 Swiss franc equaled 37 U.S. cents.

remained at its 1973 level, while earnings increased. The practice of revaluing previous years' earnings to compute pensions began in 1970. These events explain the uneven character of the replacement rates shown in table 1.

## United Kingdom

*Formula*—The pension structure was changed in April 1975 from a flat-rate pension plus an earnings-related component to a flat-rate pension only. Concurrently, the benefit amount was increased to exceed the combined total of the former flat-rate and earnings-related pensions.

*Characteristics affecting replacement rate*—In its new form, the pension amounted in 1975 to £11.60 weekly for a single pensioner.<sup>11</sup> A dependent wife received a £6.90 weekly supplement, the couple's total amount was £18.50. An income-tested allowance established a minimum weekly income for all needy aged, however, that amounted to £12.85 for single persons and £19.10 for couples. For a pensioner with no other income, this allowance therefore became the minimum pension. The result of the changes in the pension form was a notable increase in the replacement rate for 1975.

Social security benefits are adjusted according to changes in the wage index and other economic factors. Those qualifying for supplementary pensions under the pre-April 1975 system will continue to receive these benefits, which are usually quite modest.

## DEFINITIONS

The two most relevant definitions needed to carry on this study were standard descriptions of remuneration for work, on the one hand, and of cash benefits after retirement, on the other. The conclusion was reached after discussion with the Bureau of Labor Statistics of the U.S. Department of Labor and with the Wage Statistics Division of the International Labor Organization that the ILO earnings series was the most useful in terms of comparability.

<sup>11</sup> As of Dec 31, 1974, equaled \$2.32 (U.S.).

*Average worker*—The “average” worker became the man working in manufacturing, as reported by the ILO. In reality, the spectrum of old-age beneficiaries in any country will include those with extremely short or extremely long working lives, consistently high or consistently low earners, white- and blue-collar workers (for which there may be separate systems), women, the employed and the self-employed, and early and late retirees—as well as new and old pensioners, persons with reduced benefits, and members of special programs (such as miners, seamen, and farmers)

For the sake of uniformity, the average worker in manufacturing is considered to be fully qualified for an old-age pension at the normal retirement age, with legislative provisions for the pertinent age group taken into account. In actuality, it is not possible to get a count of persons at the average level. Other studies indicate that a substantial number of retirees are not in fact eligible for a full regular pension, simply because they were born before current systems came into force, because of interruptions in employment, because of early retirement, or other factors. Where pertinent, the number of years worked has been calculated at 30, 40, or even 50, and the retirement age is considered to be the statutory one for the country—most often age 65—with an actual career thus simulated.

*Average pension*—To determine the other half of the relationship—the pension for the average worker—it became necessary to “work out” what the pension would be for a worker retiring from manufacturing in a given year. It was assumed that the worker had been at the average earnings level for manufacturing throughout the pertinent years of coverage. The true pattern would undoubtedly show the earnings of the manual worker declining in his older years but those of the white-collar worker increasing. Nevertheless, the advantages of using the most nearly comparable earnings series seemed to be the determining factor. In addition, it may be argued that the most significant comparison for evaluating a retirement system is the replacement rate for the great body of steady middle-earnings level workers—in this case, the average worker in manufacturing—as social policies relating to low incomes take a great variety of forms in different countries.

The early private pension plans that predated organized labor covered white-collar workers only. Blue-collar workers were phased in later. In the years since World War II, labor generally concentrated its efforts first on updating the social security program and then on gaining equality in private pensions.

This more recent trend toward blue-collar participation in private pension plans was strengthened by the mood of social progress that prevailed during the 1960's and early 1970's. Private pensions in France became obligatory, except for the smallest employers (such as those hiring domestics). Sweden fairly recently instituted a plan for blue-collar workers, in addition to the already established white-collar pension plan.

The importance of private pension plans in the total pension picture varies. They may cover as much as 60–80 percent of the working population but often cover considerably fewer workers. Where employer-employee agreements provide coverage for large segments of the work force, it is usually assumed that they will become patterns for other employers to provide similar coverage. In the Scandinavian countries and France in particular this is the philosophy.

In the European countries the larger companies are those that have private pension plans. In manufacturing, particularly, these plans cover blue-collar workers. The “average worker in manufacturing” would therefore be covered in the European countries, and a more realistic and adequate measurement of his old-age income would have to include both the social security old-age benefit and the private pension.

“Vesting” and “portability” are two important features that often reflect the quality of a private pension program. Under vesting the individual has the right to a pension on reaching pensionable age, if he has worked a minimum number of years for one employer, whether or not he is still with that employer at retirement. The portability feature permits the employee to transfer his pension credits from one employer to another as he changes employment. Both vesting and portability are becoming more common.

Table 2 highlights some aspects of the private pension programs in five of the countries studied. Vesting and portability features are found in all

countries in the group except the United Kingdom

France and the Netherlands have the most widespread systems covering 80 percent or more of the working population. West Germany and Sweden cover 60 percent of their working population. The United Kingdom presents a problem in terms of coverage because all persons "contracted out" of the national pension program are, in the strict sense, covered by private insurance. For purposes of comparison, however, only those who receive contracted-out pensions in excess of their national pensions should be counted. It is estimated that nearly half the working population is contracted out and that these pension amounts exceed the social security benefits in most cases. A higher proportion of white-collar than blue-collar workers are involved.

Unlike the social security benefits, private pension amounts are usually indexed only to a limited extent or not at all. Consequently, they tend to lose some of their purchasing power with the passage of time. It has been common practice in Europe for the employer to promise a certain replacement rate, such as 65 percent. This replacement rate consists of the social security benefit (55 percent, perhaps) and the private pension (10 percent). The social security benefit is indexed but the private pension may not be, so the proportion of the former grows with time and the proportion of the latter shrinks. Thus, after 10 years the social security benefit may make up 62 percent of the replacement rate and the private pension only 3 percent. This type of offset is disappearing, however. Under the growing mandatory pension systems, ways to adjust the private pensions are being developed.

### Derivation of Replacement Rates

This section details the method of deriving the replacement rates for the private pensions in five of the countries studied.<sup>12</sup>

*The Federal Republic of Germany*—The replacement rate for private pensions is derived from an official national survey. The survey shows the replacement rate as a proportion of monthly final pay. Of all blue-collar workers covered, 66

percent received a private pension of 15 percent or more of past earnings after 35 years of covered employment. An earlier survey has shown that 63 percent of these workers received pensions whose replacement rate was 15–25 percent. The more recent survey showed that the monthly pension of blue-collar workers with high earnings was 200–350 deutsche marks per month.<sup>13</sup> In the survey year, workers in manufacturing had average monthly earnings of DM 1,600. The replacement rate for such earnings would be 12.5–22 percent.

*France*—The general system of private pension plans provides a specific formula for calculating a private old-age pension to equal 0.55 percent of covered earnings for each year of service. The intent is to provide a replacement rate that is 20 percent of earnings. The formula calls for 44 years of coverage to qualify for the pension. The system began in 1957, however, so that by 1975 it was possible to have only 18 years of coverage or 18/44 of the required coverage. The pension thus was 18/44 of 20 percent, or 8 percent, of earnings.

*Netherlands*—In the Netherlands, the industry-wide pension plans pay 10 percent of the final earnings, according to national surveys, which showed that the actual payments ranged from 1,400 guilders to 2,500 guilders per year.<sup>14</sup> The average man working in manufacturing earned 23,000 guilders in 1975. A pension of 1,500 would represent a replacement rate of about 7 percent, 2,500 guilders would replace about 11 percent of earnings.

*Sweden*—The Swedish formula for the blue-collar fund calls for a pension that is 10 percent of the average of the best 3 years in the 5-year period from age 59 to age 63, inclusive. The pension is not scheduled to mature until 1981. For each year before 1981, one-twentieth of the full benefit is deducted. A retiree was credited with fifteen-twentieths for 1975. Thus the formula worked out as follows: Fifteen-twentieths of 10 percent is 7.5 percent, rounded to 8.0 percent, 8.0 percent of average creditable earnings for an average worker retiring at the beginning of 1975 was 1,778 kroner, final pay was 32,000 kroner.<sup>15</sup> The private pension was, therefore, about 6 percent of final pay.

<sup>12</sup> As of Dec 31, 1974, 1 deutsche mark equaled 40 U.S. cents.

<sup>14</sup> As of Dec 31, 1974, 1 guilder equaled 39 U.S. cents.

<sup>15</sup> As of Dec 31, 1974, 1 krona equaled 23 U.S. cents.

<sup>13</sup> For the principal sources of information on private pensions, see page 14.

*United Kingdom*—National surveys by the Government Actuary of the United Kingdom have shown that the typical formula provides 1 66 percent a year of service, based on the average of the highest 3 of the last 10 years. In 1959 the present system of “contracting out” under the social security program in order to have private coverage began. Payment of full pensions was foreseen after a 20-year buildup. As of 1975, credit was granted for 16 years, or 27 percent (1 66 percent per year for 16 years) of the average of the high 3 years. For an average worker in industry this amount was £42 26 per week, and 27 percent is £11 41. The contracted-out private pension was about 23 percent of final pay.

### Combined Replacement Rate

The tabulation that follows indicates what the replacement-rate level would be, in the five countries studied, for an average worker in manufacturing, if the benefits from social security and private pension plans were combined.

Country	Replacement rate (percent) <sup>1</sup>	
	Single worker	Aged couple
Federal Republic of Germany	62-72	62-72
France	54	73
Netherlands	45-49	61-65
Sweden	65	82
United Kingdom	49	62

<sup>1</sup> Derived from tables 1 and 2.

The benefit level after combining the benefits ranges from 45-49 percent in the Netherlands and the United Kingdom to 72 percent in the Federal Republic of Germany in terms of former earnings for the single pensioner. For aged couples the range is from 62 percent in the United Kingdom to 82 percent in Sweden. Certain other social security-related benefits (in Sweden, for example, one-half of all old-age pensioners receive housing allowances) and occasional tax advantages may increase benefits still more, to considerably beyond the level reflected in the tabulation. In addition, although private pensions and other social security-related coverage at the present time are far from universal, the continued broadening in this area—in terms of the number covered—indicates that it may become increasingly common to take the private pension into account when con-

sidering the replacement rate of the social security benefit.

### Sources of Data

Federal Republic of Germany: *Arbeitsgemeinschaft für Betriebliche Altersversorgung, Betriebliche Altersversorgung*, Heidelberg, selected issues, Max Horlick and Alfred M. Skolnik, *Private Pension Plans in West Germany and France* (Research Report No 36), Social Security Administration, Office of Research and Statistics, 1971.

France: Jacques Doublet, *Association Général des Institutions de Retraites des Cadres*, and Paul Hacquet, *Association des Régimes de Retraites Complémentaires*, in *Etudes et Recherches* (No 3), International Social Security Association, 1976; Max Horlick and Alfred M. Skolnik, *op cit*; *Union des Industries Metallurgiques et Minières, Sécurité Sociale*, Paris, 1974.

Netherlands: *Commissie van Bedrijfspensioenfondsen*, The Hague, March 1977; W. L. Van Leuwen, *Netherlands, National Summary*, International Social Security Association, Fifth Conference of Actuaries, Berne, 1971; Anne Menzies, *Provisions for the Elderly in the Netherlands* (Monograph), Edinburgh, 1972.

Sweden: Svenska Personal-Pensionskassan, *Social Insurance and Private Occupational Pensions in Sweden*, Stockholm, selected years; Svenska Personal-Pensionskassan, *The STP Plan from July 1, 1976*, Stockholm, February 1976 and March 1976, The Swedish Employers' Confederation, *The ITP Plan During the Years 1974-1975*, Stockholm, October 1974, Riksforsakringsverket, *Swedish Pensions*, September 1973 and January 1974, Landsorganisationen, *Forhandlingsprotokoll*, Stockholm, May 1976.

United Kingdom: National Association of Pension Funds, *Survey of Occupational Pension Schemes 1975*, London, 1975; Denys Bevan, *Social Security Supplementary Schemes in the United Kingdom*, European Institute of Social Security, London, December 1975; C. E. Clarke, *United Kingdom, National Summary*, International Social Security Association, Fifth Conference of Actuaries, Berne, 1971, Department of Health and Social Security, *Social Security Act 1973, Occupational Pension Schemes* (Leaflet NP3), 1973.