
Retirement Options Under the Swedish National Pension System

by Michael D. Packard*

This article reviews the retirement options available to Swedes aged 60 to 64 under their national pension system. Summaries of the various options are followed by an analysis of the relative attractiveness of each option using hypothetical 60-year-old workers with varying characteristics. The proportion of 60- to 64-year-old Swedes selecting each option corresponds closely to the relative attractiveness orderings computed for these hypothetical workers. Sweden has a unique pension alternative called the partial pension program that allows workers aged 60-64 to reduce their hours of work to within prescribed limits and receive a pension equal to half the earnings they lost. The Swedish experience with this popular pension is described in some detail.

The development of the Swedish national pension system has created an unusually large number of benefit receipt possibilities for those aged 60-69. The system offers the options of claiming full retirement benefits at age 65, claiming reduced benefits at age 60, or claiming actuarially increased benefits if receipt is delayed past age 65. In addition, half the benefit may be claimed at one age and the other half at another age—with each half adjusted independently to reflect the age at which it was first drawn. Since 1976, the Swedish national pension system has had a unique program that allows qualified workers aged 60-64 to draw partial pensions if they reduce their working hours to within prescribed limits. Sweden also offers invalidity pensions, which are similar in size to age-65 retirement pensions, to all workers under age 65 who are permanently disabled and to non-disabled workers aged 60-64 who have experienced prolonged periods of unemployment.

This article reviews the Swedish program and analyzes the relative attractiveness of its various retirement options. The first section describes the major features of the Swedish system. The second briefly reviews the various pension benefit receipt alternatives a Swedish worker faces. The third focuses on the relative attrac-

tiveness of these alternatives for hypothetical workers with selected characteristics. The Swedish experience with the partial pension program is detailed in the fourth section and is followed by a summary.

Principal Features

The Swedish national pension system is a two-tiered social security program that consists of a basic pension, or "demogrant," and a supplementary, earnings-related pension. Benefit levels for both are tied to a common "base amount."¹ The base amount for 1982 is 17,800 kronor, or about \$3,080; it is adjusted annually by a special price index.²

The Demogrant

The demogrant is payable to all qualifying Swedish citizens domiciled in Sweden regardless of the level of their previous earnings.³ The demogrant available to an individual aged 65 or older is 95 percent of the base

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¹ The base amount was set by legislation at 4,000 kronor as of September 1957. Until October 1980, the base amount was adjusted monthly if the Swedish general price index increased by at least 3 percentage points. In early 1981, indirect taxes and changes in the price of energy were removed from the general price index. In December 1981, Parliament voted to change the base amount only once a year. Both the change in the price index and the move to adjust the base amount only once a year were undertaken to slow the rate of pension growth.

² One krona = \$0.17 (May 1982).

³ Under certain circumstances, Swedish citizens not domiciled in Sweden and foreign nationals can qualify for the demogrant.

amount and that available to each member of an aged couple is 77.5 percent. In 1982, the demogrants were approximately \$2,925 for an individual and \$4,775 for an aged couple (\$2,387 each). The demogrant is increased for individuals or couples who do not also qualify for an earnings-related pension.

Earnings-Related Pension

The earnings-related pension is designed to provide a worker with an old-age pension of about 60 percent of his or her former earnings above the base amount. The size of this pension is based on a worker's pension points which, in turn, are based on pensionable earnings—that is, earnings in excess of the base amount up to 7.5 times the base amount. Consequently, in 1982, only earnings between about \$3,080 and \$23,100 are counted as pensionable earnings. Pension points are calculated each year by dividing the base amount for the year into the worker's pensionable earnings for the year. For example, suppose a worker earns \$15,000 in 1982. The pensionable income for that year will be \$11,920 (\$15,000 - \$3,080), since earnings below the base amount are not counted as pensionable earnings. The worker is thus credited with 3.87 pension points for 1982 ($\$11,920 \div \$3,080 = 3.87$).

To determine the level of a worker's earnings-related benefit, the pension points for the highest 15 years are averaged. This average is then multiplied by 60 percent of the base amount established for the year in which the worker claims benefits. The result is the earnings-related pension. For example, assume a retiree's average pension points for the 15 years with highest pension points is 4.0. The earnings-related pension in 1982 would be about \$7,400. This pension is computed by multiplying 4.0 (average pension points) times 0.6 times \$3,080 (the base amount for 1982).

To receive any earnings-related pension, an individual must have at least 3 years with pension points. To receive the "full" earnings-related pension, the individual must have had pensionable earnings for at least 30 years (exceptions are made for those born before 1924). The earnings-related pension is reduced by 1/30 for each year short of 30 years. For example, if the worker's full earnings-related pension was \$7,500, but the worker had only 25 years with pensionable earnings, the earnings-related pension would be reduced to \$6,250, a \$250 or 1/30 reduction for each of the 5 years short of the 30-year requirement.

Financing

The Swedish national pension system is much more expensive than the comparable Social Security program in the United States. The Swedish demogrant and earnings-related pension are financed chiefly by employer

contributions of 8.45 percent and 9.40 percent of total payroll, respectively (1982 rates). The demogrant is supplemented by government appropriations equal to about 3 percent of total payroll. There are no employee contributions to either the demogrant or the earnings-related pension. Thus, the total cost of the demogrant and earnings-related pension is about 21 percent of payroll. By comparison, the total cost of the U.S. Old-Age, Survivors, and Disability Insurance (OASDI) program in 1982 is about 10.8 percent of taxable payroll. Moreover, in Sweden all earnings in employment covered by the national pension system are subjected to the payroll tax, whereas in the United States, only earnings in covered employment up to \$32,400 (which amounts to about 91 percent of all covered earnings) are taxed. Thus, in terms of total payroll, the Swedish system costs just over twice as much as the U.S. program.

The Swedish demogrant is financed on a pay-as-you-go basis—program revenues are paid out almost immediately as benefits. The earnings-related pension, on the other hand, is partially funded—not all current revenues are paid out as current benefits. What is not paid out is invested but it could be used in the event that benefits exceed revenues. At current contribution rates, it has been estimated that revenues will equal earnings-related pension payments in 1985. After that, current revenues will no longer be sufficient to pay current benefits, and the reserves now being accumulated will gradually be drawn down. This process will continue until, under current estimates, the fund will be exhausted by the year 2005.⁴

The Swedish national pension system, which provides old-age, survivors', and invalidity pensions, is only one part of the Swedish social security system. The system also includes a national health insurance scheme, workers' compensation, unemployment insurance, and family allowances. The costs of these other components is also borne by employer contributions as follows:

Component	Percent of total payroll
Partial pensions	0.5
National health insurance	10.5
Workers' compensation . . . . .	.6
Labor-market (unemployment) insurance . . . . .	.8
Public child care	2.2
Other social security contributions	1.405

⁴ Estimates are from Tor E. Eriksen, "Some reflections on the role of the National Supplementary Pension Scheme in the Swedish pension system," *International Social Security Review*, Vol. 4, 1981, pages 410-426.

Thus, in 1982, employers in Sweden made contributions equal to 33.055 percent of their total payroll to the Swedish social security system.⁵ These rates are adjusted, usually upward, about once a year.⁶

Pension Alternatives

The Swedish national pension system allows an individual to begin drawing benefits at any age between 60 and 69. Table 1 outlines the work and age limitations and benefit adjustments for the major pension alternatives. These alternatives are normal pension receipt, delayed receipt, early receipt, split receipt, invalidity or disability receipt, and partial pensions.

Normal Pension Receipt

The normal retirement age in Sweden, as in the United States, is 65. At this age, an individual or couple is entitled to receive both the demogrant and earnings-related pension. No dependent benefits are paid under

⁵ The vast majority of Swedish employees are unionized, and national collective bargaining agreements impose additional payroll contributions on employers for severance pay, sick pay, supplemental pensions, group life insurance, and no-fault liability insurance. In 1982, premiums for these coverages totaled an additional 5.6 percent of gross payroll for blue-collar workers and an additional 10 percent, on average, of the gross payroll of salary workers.

⁶ Employers recently received some marginal relief, however. Effective January 1, 1982, no contributions are made on the earnings of employees aged 65 or older as of the previous January 1st. Before 1982, the age-65 limit was applicable only for contributions to the earnings-related pension plan.

either the demogrant or the earnings-related pension program. Survivor benefits are paid under both programs, however.

Unlike U.S. Social Security, the Swedish system has no earnings test (or retirement test) as a condition for receipt of either the demogrant or the earnings-related pension. Thus, a worker can claim a full pension at age 65 and continue regular employment. All pensions paid by the Swedish social security system are subject to the Swedish income tax. This policy also differs from the treatment of U.S. Social Security benefits.

Delayed Pension Receipt

Deferring pension receipt past age 65 results in a benefit increase of 0.6 percent for every month (7.2 percent for every year) of deferment up to age 70. There is no further increase if benefits are deferred past that age. Thus, at age 70, the pension is increased by 36 percent. Both the demogrant and the earnings-related pension are increased by delaying benefit receipt.

Pension points are computed only on earnings between ages 16 and 64. Earnings at or after age 65 cannot be used to increase the earnings-related pension. The incentive to work past age 65 caused by the delayed retirement credit may be offset because the earnings-related pension is not adjusted for earnings after that age.

The absence of an earnings test might be expected to encourage Swedes to work after age 65, but relatively few do. The labor-force participation rate among all persons aged 65-74 in Sweden was only 8.6 percent in 1980 (about half the rate for such persons in the United

Table 1.—Some characteristics of pension receipt alternatives available to Swedish workers aged 60-69

Alternative	Work limitations	Age limitations	Benefit size before age 65	Benefit size at and after age 65
Normal Pension Receipt	None	65	...	Age-65 benefit.
Delayed Pension Receipt	None	65-69	...	Age-65 benefit increased by 0.6 percent for each month receipt is delayed past age 65.
Early Pension Receipt	None	60-64	Age 65 benefit reduced 0.5 percent for each month receipt is taken before age 65. The individual can take all the reduced benefit or half the reduced benefit.	Same as benefit taken before age 65 if the entire benefit is received before age 65. If only half the benefit was taken before age 65, the post-age-65 benefit equals the reduced benefit taken before age 65 plus the unreduced (or increased) benefit for the half pension taken at (or delayed past) age 65.
Disability Pension Receipt	Must be at least 50 percent disabled (physically or mentally) or must be unemployed and have exhausted unemployment compensation.	60-64 (Disability pensions convert to normal retirement pensions at age 65).	A. Depends on degree of disability (either 1, 2/3, or 1/2 times age-65 benefit). B. Full age-65 benefit if unemployable.	Age-65 benefit.
Partial Pension Receipt	Must reduce work effort by at least 5 hours per week on average, but must work an average of at least 17 hours per week.	60-64	50 percent of earnings lost because of reduction in hours worked.	Age-65 benefit.

States). The relatively generous benefits in Sweden could, in part, explain this low labor-force participation rate.

Early Pension Receipt

Swedes may elect to receive actuarially reduced pension benefits before age 65. Both the demogrant and the earnings-related pension may be taken as early as age 60. Both are reduced by 0.5 percent for each month they are received before age 65. Thus, at age 60, the reduction is 30 percent. The actuarial reduction is permanent.

Split Pension Receipt

In the Swedish system, an individual can choose to receive only half the pension at the reduced rate. If the individual delays receipt of the other half until age 65, that portion will not be reduced. For example, an individual who would be eligible for a combined demogrant and earnings-related pension of \$10,000 per year at age 65 could accept a reduced pension of \$7,000 per year at age 60. Alternatively, the same individual could accept half the reduced pension (\$3,500) at age 60 and wait until age 65 to receive the other half at its unreduced level (\$5,000). After age 65, then, the individual would receive a pension of \$8,500 per year.

Because pension eligibility is not qualified by an earnings test, an individual aged 60-64 can elect to continue to work while drawing a half pension. Earnings above the base amount are still considered as pensionable income and may contribute to higher earnings-related benefits on the half pension not claimed early. Deferring acceptance of the other half of the pension past age 65 will result in an actuarial increase on this half of 0.6 percent per month of delay. Such a delay will result eventually in an actuarial increase equal in size to the actuarial decrease in the half pension accepted early. Thus, the individual can receive an unreduced pension from about age 69 on, even though some actuarially reduced benefits were taken as early as age 60.

Disability Pension Receipt

A disability (invalidity) pension is payable to any insured person aged 16-64 who is at least 50 percent disabled and whose disability is regarded as permanent.⁷

⁷ To receive a disability pension, the disabled Swede must have had pension points in 2 of the preceding 4 years. Insured persons considered to have been engaged in a gainful occupation at the time of becoming disabled are credited with "assumed pension points" for the year the disability occurred up to, and including, the year during which they reach age 65. The number of the pension points accredited is the higher of the average pension points for the 4 years preceding the disability or the average for all years since age 16. Disability benefits are payable until death, recovery, or attainment of age 65, when they are replaced by old-age pensions.

The size of the disability pension benefit varies from 50 percent to 100 percent of the full retirement benefit depending upon the degree of disablement. The eligibility requirements were relaxed somewhat in the early 1970's to allow the payment of a full disability pension to certain workers aged 60-64 who either were unable to cope with their work environment or had experienced prolonged periods of unemployment. Unemployed insured persons aged 60-64 are eligible for the disability pension if they have exhausted their compensation from an approved unemployment insurance fund and are judged to have no real prospects of finding work. In these cases, the full disability pension is awarded without regard to medical condition. Approximately 35 percent of all Swedish disability benefits are paid to persons aged 60-64.

Partial Pension Receipt

Partial pension benefits are available to wage and salary workers meeting the following conditions: They must be aged 60-64, must have been employed for at least 5 of the 12 months preceding application for the partial pension, and must have had pensionable earnings for at least 10 years from age 45. The workers' employers must agree to let them work part time and the workers must agree to reduce their hours of work by an average of at least 5 hours per week while maintaining an average of at least 17 hours work per week. The self-employed must reduce their hours of work by at least 50 percent but maintain an average work week of at least 17 hours. (The normal full-time work week in Sweden is 40 hours.)

Persons who meet the above requirements are entitled to claim partial pension benefits. Once they claim these benefits, they cannot apply for or receive either the demogrant or the earnings-related old-age benefit until age 65. Neither of the latter pensions is reduced by the acceptance of the partial retirement pension. Moreover, the partial pension itself can be considered pensionable earnings and can be used to build up points under the earnings-related pension.

The partial pension replaces 50 percent of the income loss sustained when a wage or salary worker transfers to part-time work. Special benefit payment rules for the self-employed result in their average benefits being only about 75 percent as large as the average benefits of partially retired employed persons.

Partial pension benefits, like the earnings-related benefits, are based only on earnings up to 7.5 times the base amount. For example, if a worker initially had earnings in 1982 of \$25,000 (\$1,900 above 7.5 times the base amount) and reduced work effort and earnings by half, the worker would receive a partial pension of only \$5,300 (0.5 times (\$23,100 - \$12,500)) not \$6,250, because earnings above 7.5 times the base amount are ignored by the partial pension system.

Examples of Options for Workers Aged 60-64

The Swedish worker aged 60-64 has a variety of pension options involving different combinations of employment, earnings, and benefit receipt. It is not a simple matter to determine which options the worker finds relatively the most attractive. To gain an appreciation for the relative attractiveness of the alternatives, this section employs several measures of attractiveness to determine the preference of hypothetical workers with selected characteristics.

Hypothetical Average-Wage Earner

To facilitate a comparison among the various options, a series of calculations for a hypothetical 60-year-old worker have been made using a set of simplifying assumptions: (1) The base amount is constant at \$3,000; (2) the worker, aged 60, earns \$12,000 per year or \$6.00 per hour based on a 2,000-hour work year;⁸ (3) the worker has an average of 3.0 pension points; (4) the worker will live until age 80;⁹ and (5) wages and prices are constant over time. Under these assumptions, the worker's full pension is \$8,250 (\$2,850 from the demogrant (0.95 times the base amount) and \$5,400 from the earnings-related pension (0.6 times the average pension points times the base amount)). This total pension represents 69 percent of the worker's full-time earnings of \$12,000.

⁸ \$6.00 per hour was roughly equivalent to the average wage rate in Sweden, 1979.

⁹ In 1980, the Swedish life expectancy at age 65 was 14.3 years for men and 17.9 years for women.

The hypothetical worker is assumed to have the following six pension-work options:

- **Normal Retirement.** Continue working until age 65; retire with full pension
- **Early Retirement.** Retire at age 60 with reduced pension (70 percent of the Normal Retirement pension)
- **Work with Half Pension.** Receive Early Retirement pension at age 60 (70 percent of half the full pension) and continue working full time until age 65. At age 65, receive the other half of the pension unreduced. Before age 65, the pension is 35 percent of the Normal Retirement pension; at age 65, it is 85 percent
- **Partial Pension-35.** Work 35 hours per week (instead of 40) at age 60 and receive pension to replace half of the lost earnings. Retire at age 65 with Normal Retirement pension
- **Partial Pension-20.** Same as above except reduce the number of hours worked to 20
- **Disability.** Be fully disabled or unemployed with no more benefits available from unemployment compensation; receive Normal Retirement pension at age 60

Replacement rates. Table 2 shows the worker's replacement rate at age 60 and age 65 under each option. The replacement rate is computed as the sum of the worker's pension plus earnings after age 60, divided by full-time earnings of \$12,000. The replacement rate between ages 60 and 64 for this worker varies from 48 percent for the Early Retirement option to 124 percent for the Work with Half Pension option. For all options except Disability and Early Retirement, the individual is

Table 2.—Hours worked, earnings replacement rates, income from age 60, and relative cost of leisure under various pension receipt alternatives for hypothetical worker with average earnings¹

Pension option ²	Replacement rate		Hours worked between ages 60 and 65	Case 1—worker lives to age 80; 3 percent discount rate		Case 2—worker lives to age 85; 3 percent discount rate		Case 3—worker lives to age 80; 0 percent discount rate	
	At age 60	At age 65		Income from age 60	Cost of leisure	Income from age 60	Cost of leisure	Income from age 60	Cost of leisure
	Normal Retirement	1.000		0.688	10,000	\$144,110	...	\$165,657	(3)
Early Retirement . . . . .	.481	.481	0	88,495	\$5.61	103,578	\$6.21	115,500	\$6.83
Work with Half Pension	1.241	.584	10,000	144,605	(3)	162,920	...	179,625	...
Partial Pension-35 . . . . .	.938	.688	8,750	140,573	3.23	162,120	2.83	180,000	3.00
Partial Pension-20 . . . . .	.750	.688	5,000	129,959	2.93	151,506	2.83	168,750	3.00
Disability . . . . .	.688	.688	0	126,421	1.82	147,968	1.77	165,000	1.88

¹ Assumptions: The worker's wage rate is \$6.00 per hour or \$12,000 per year; Worker has an average of 3 pension points and has at least 30 years with pension points; wages and prices are constant over time; and the base amount is \$3,000.

² Normal Retirement: The worker retires at age 65.

Early Retirement: The worker retires at age 60 and his or her pension is permanently reduced by 30 percent.

Work with Half Pension: The worker takes a reduced pension equal to 35 percent of Normal Retirement pension and continues to work to age 65. After retirement, pension equals 85 percent of Normal Retirement pension.

Partial Pension-35: The worker reduces labor supply to 35 hours per week and receives a pension equal to half the lost earnings. At age 65 the worker retires and draws Normal Retirement pension.

Partial Pension-20: The worker reduces labor supply to 20 hours per week and receives a pension equal to half the lost earnings. At age 65 the worker retires and draws Normal Retirement pension.

Disability: The worker is unable to work and receives Normal Retirement pension at age 60.

³ Cost of leisure computed relative to this pension option. Cost of leisure is computed by dividing the difference in income from age 60 by the difference in hours worked between ages 60 and 65.

assumed to work until age 65 and then retire completely. When work continues past age 60, the replacement rates fall at age 65. At age 65, the Early Retirement option still has the lowest replacement rate—48 percent. The rate for the Work with Half Pension option falls to 58 percent. For the other four options, the replacement rate is 69 percent.

Lifetime income after age 60. The replacement rate is a common measure of the adequacy and attractiveness of the benefits available under alternative pension schemes. The rate is not a good device for measuring the relative attractiveness of options that have benefits beginning at different points in time because it does not take into consideration how long the rate will remain in effect. For example, if one looks at the age-60 replacement rates in table 2, one would conclude that Work with Half Pension is the best option. At age 65, however, four other options have higher replacement rates.

This shortcoming in the replacement rate measure can be overcome by focusing instead on comparisons of the expected value at age 60 of the worker's total lifetime income under each of the options. This measure is the discounted total income (earnings plus pensions) the hypothetical worker will receive from age 60 until death.¹⁰ Case 1 in table 2 (the average-worker case) assumes that the worker will live to age 80 and that the discount rate is 3 percent—that is, \$100 a year from now is worth \$97 today. Discounted lifetime income under the various alternatives varies from \$88,000 for Early Retirement to \$145,000 for Work with Half Pension. Under this measure of relative attractiveness, Work with Half Pension is the most preferred alternative. The Normal Retirement option ranks a close second.

The discounted total income from age 60 until death measure is sensitive, however, to assumptions about the individual's life expectancy and the discount rate. Case 2 in table 2 (the long-lived worker case) addresses this sensitivity by assuming the hypothetical worker will live until age 85. The discounted total incomes for all alternatives are higher in this case because the worker is receiving pensions for an extra 5 years. The increase is less for Early Retirement and Work with Half Pension than for the other four alternatives since the size of the yearly pension benefit after age 65 is less for those two options. Increasing the life expectancy causes the Normal Retirement option to have the largest discounted total income from age 60 (\$166,000). Work with Half Pension (at \$163,000) is the second preferred option, and the Partial Pension-35 option (at \$162,000) is the third choice.

In case 3 (the 0-percent discount case), the worker is assumed to live to age 80 and to have a 0-percent

¹⁰ The discount rate is used to find the present value of money that is to be available at some time in the future. In a simple sense, a discount rate is the opposite of an interest rate. If a worker has \$1 now and invests it at an annual interest rate of 5 percent, next year the worker will have \$1.05. Likewise, if the discount rate is 5 percent, then \$1.05 next year is only worth \$1 today.

discount rate—that is, no preference for current over future income (\$100 one year or ten years from now is valued the same as \$100 today). Lowering the discount rate increases the relative attractiveness of those options offering the highest benefits after age 65. As in the long-lived worker case, the total income for Normal Retirement (\$184,000) is greater than that for Work with Half Pension (\$179,000), the option with the highest total income in the average-worker case. In the 0-percent discount rate case, the Partial Pension-35 option also has a higher total income from age 60 (\$180,000) than does the Work with Half Pension option.

Cost of leisure. Cases 2 and 3 show that modest changes in assumptions about life expectancy or the discount rate can change the pension options with the highest income from age 60. Given the construction of income from age 60, either of the two full-time work options—Normal Retirement or Work with Half Pension—will always have more income from age 60 than the other options if the wage rate is not falling.

Not all Swedes work full time between age 60 and 65, and this fact dramatizes a shortcoming in the use of income from age 60 as a measure of the relative attractiveness of the six pension alternatives: Income from the age-60 measure does not take the worker's preference for leisure into account. It is generally assumed that, other things being equal, an individual is likely to prefer not working to working. Thus, many workers may find that options involving substantially less work and somewhat lower lifetime incomes are preferable to those involving more work and higher lifetime incomes.

To quantify the relationship between lifetime income and hours of work from age 60 under each option, a calculation of the average cost per hour of additional leisure is made for each of the options involving less than 10,000 hours of work between the ages of 60 and 65. The average cost of leisure is computed by dividing the difference in total income from age 60 between the highest-income option and a more-leisure option by the increase in leisure hours given by that more-leisure option.^{11, 12}

¹¹ In a static sense, the cost of leisure to the worker is equal to the wage rate, in this case \$6.00 per hour. For each extra hour of work given up, the individual immediately loses one hour of wages. If the worker has a nonzero discount rate, then when the extra hour of leisure is taken, it will affect its value at age 60. Also, if the extra leisure affects the size of the pension, either in the period the leisure is taken or in a later period, then the marginal value of that leisure can be expected to deviate from the \$6.00 per hour figure. The computed cost of leisure, then, can be viewed as a net wage rate.

¹² In the strictest sense, it is the marginal cost of leisure, not the average cost of leisure, that affects the worker's decision of how much leisure to "consume." Economic theory tells us that the more leisure a person consumes, the less that person will value an additional unit. The person will consume leisure until its marginal value is equal to its marginal cost. Since the worker's indifference curves are unknown, the marginal value of leisure at any point is unknown. Therefore, it adds little to compute the marginal cost of leisure for the different alternatives. By computing the average cost of leisure, it is stressed that there is a leisure-income tradeoff facing the worker.

For example, in case 1 of table 2, the Work with Half Pension option provides the highest expected income after age 60 (\$144,605) but also involves full-time work (10,000 hours) between ages 60 and 65. The Partial Pension-20 option, in contrast, provides lower lifetime income (\$129,959) but involves 5,000 more hours of leisure between ages 60 and 65. The average cost per hour of additional leisure under the latter option is measured as the decrease in income divided by the increase in leisure: $(\$145,605 - \$129,959) \div 5,000 \text{ hours} = \2.93 per hour. Thus, for this hypothetical worker whose wage rate is \$6.00 per hour, the additional hours of leisure under the Partial Pension-20 option cost only \$2.93 per hour relative to the pension option that yields the highest lifetime income after age 60. The \$2.93 per hour is the worker's net wage, the average amount of money the worker gives up over the remainder of his or her life for each additional hour of leisure.

Table 2 gives the cost of leisure for the hypothetical worker under the three sets of assumptions about his or her life expectancy and the discount rate. The Disability alternative always has the lowest average cost of leisure for these three cases. This option is expected to be the low-cost option because the Disability pension is designed for those who are considered unable to work.

The option with the next lowest cost of leisure is Partial Pension-20. The hourly costs under this alternative vary from \$2.83 for case 2 to \$3.00 for case 3, or from 47 percent to 50 percent of the worker's wage rate of \$6.00 per hour. The costs of leisure under this option are low enough that Partial Pension-20 may be an economically attractive alternative to working full time. The worker must satisfy certain labor-force attachment criteria, however, to be eligible for the Partial Pension option.

When Normal Retirement is the high-income alternative, the cost of leisure for both Partial Pension options will be identical. Since the size of the pension after age 65 is the same for the Partial Pension options and the Normal Retirement option, the difference in total income between these choices will be proportional to the differences in hours of work between the ages of 60 and 65. When Work with Half Pension is the high-income option, the costs of leisure for the two Partial Pension alternatives differ, primarily because Work with Half Pension provides a lower pension benefit after age 65 so that differences in total income levels are not proportional to differences in hours worked.

If the worker is not eligible for either the Disability or the Partial Pension option, the individual can increase hours of leisure by selecting Early Retirement. The cost of leisure is very high under this alternative, so unless the worker has an extremely high preference for leisure, he or she will probably not select Early Retirement.

Other Hypothetical Workers

The examples so far have been for an average wage earner with steady earnings. The method of calculating pension benefits in Sweden provides an incentive for some workers with nonsteady earnings histories to work beyond age 60. Table 3 explores the same six pension-receipt options for three other hypothetical workers—a short-service worker, a worker whose earnings have been rising over time, and a worker whose earnings fall after age 60—to see if the relative attractiveness of the six options to these workers differs from that found for the average earner in case 1. In all three of these cases,

Table 3.—Income from age 60, relative cost of leisure, and earnings replacement rates under various pension receipt alternatives for a hypothetical worker¹

Pension option ² and number of hours worked between ages 60 and 65	Replacement rate		Income from age 60	Cost of leisure
	At age 60	At age 65		
Case 1—wage rate is \$6.00 per hour; 3 pension point average; 30 years with pension points				
Normal Retirement; 10,000	1.000	0.688	\$144,110	. . .
Early Retirement; 0 . . . . .	.481	.481	88,495	\$5.61
Work with Half Pension; 10,000	1.241	.584	144,605	(3)
Partial Pension-35; 8,750 . . . . .	.938	.688	140,573	3.23
Partial Pension-20; 5,000 . . . . .	.750	.688	129,959	2.93
Disability; 0 . . . . .	.688	.688	126,421	1.82
Case 4—wage rate is \$6.00 per hour; 3 pension point average; 20 years with pension points				
Normal Retirement; 10,000	1.000	0.573	\$129,526	(3)
Early Retirement; 0 . . . . .	.321	.321	58,997	\$7.05
Work with Half Pension; 10,000	1.160	.447	122,564	. . .
Partial Pension-35; 8,750 . . . . .	.938	.573	125,988	2.83
Partial Pension-20; 5,000 . . . . .	.750	.573	115,375	2.83
Disability; 0 . . . . .	.458	.458	84,281	4.52
Case 5—wage rate is \$11.25 per hour; 5 pension point average at age 60; 30 years with pension points				
Normal Retirement; 10,000	1.000	0.593	\$247,734	(3)
Early Retirement; 0 . . . . .	.369	.369	127,111	\$12.06
Work with Half Pension; 10,000	1.184	.481	240,490	. . .
Partial Pension-35; 8,750 . . . . .	.938	.581	238,118	7.69
Partial Pension-20; 5,000 . . . . .	.750	.543	209,268	7.69
Disability; 0 . . . . .	.527	.527	181,587	6.61
Case 6—wage rate is \$5.00 per hour; 3 pension point average at age 60; 30 years with pension points				
Normal Retirement; 10,000	1.000	0.825	\$128,222	(3)
Early Retirement; 0 . . . . .	.578	.578	88,495	\$3.97
Work with Half Pension; 10,000	1.289	.713	126,854	. . .
Partial Pension-35; 8,750 . . . . .	.938	.825	125,678	2.04
Partial Pension-20; 5,000 . . . . .	.750	.825	118,043	2.04
Disability; 0 . . . . .	.825	.825	126,421	.18

¹ Assumptions: The worker has a 3-percent discount rate and will live to age 80; wages and prices are constant over time; and the base amount is \$3,000.

² See table 2, footnote 2, for definitions of pension options.

³ Cost of leisure computed relative to this pension option. Cost of leisure is computed by dividing the difference in income from age 60 by the difference in hours worked between ages 60 and 65.

the worker is assumed to live to age 80 and to have a discount rate of 3 percent, the same assumptions made for the average-worker case.

Short-service worker with average earnings. In case 4, it is assumed that the worker has only 20 years with pension points.¹³ Recall that under the Swedish pension system, the earnings-related pension benefits are reduced 1/30 for each year that the number of years with pension points falls short of 30 years. Thus, in case 4 the worker's earnings-related pension will be reduced by 1/3 (from \$5,400 to \$3,600) if the individual stops working at age 60. If the individual works an additional 5 years and earns pension points in each year, the earnings-related pension will be increased by 25 percent (from \$3,600 to \$4,500).

The replacement rates for a short-service worker tend to be smaller than those for the average steady worker in case 1 because the short-service worker's pension benefits are smaller. Income from age 60 is also smaller for the same reason. The high income alternative for this short-service worker is the Normal Retirement option. This result is different from case 1's high-income alternative (Work with Half Pension) because working full time between ages 60 and 65 increases the entire post-age-65 pension benefit for the worker choosing Normal Retirement but only a portion of the post-age-65 pension benefit for those who choose the Work with Half Pension option.

The cost of leisure for those options involving no work between ages 60 and 65 (Early Retirement and Disability) is very high for the short-service worker because the individual forgoes not only earnings over this period but also any increase in pension benefits that would accrue from the additional 5 years work. The low cost of leisure options are the two Partial Pension alternatives. Leisure costs less under these options than under the Disability option (for low-cost option for the steady worker) because working under either Partial Pension option increases the size of the benefit available at age 65. Since the individual does not work at all under the Disability option, the benefits for this option remain constant until the individual dies.¹⁴

A worker with rising earnings. Case 5 shows a worker whose earnings have been growing steadily over time (at 0.2 percent of the base amount each year) and whose earnings have just reached 7.5 times the base amount. This worker has an average of 5.0 pension points at age 60. Since the individual can earn up to 6.5 pension points for each year worked between age 60 and 65, the

individual can raise average pension points (and thereby increase the pension at age 65) by working. Unlike the short-service worker, the size of the pension at age 65 will depend on how many hours were worked between ages 60 and 65.

The replacement rates for the worker with rising earnings tend to be smaller than those for the worker with steady earnings because the individual's earnings at age 60 are higher than average lifetime earnings, and a portion of the individual's pension is related to an average earnings measure. The replacement rates for Normal Retirement, the two Partial Pension, and the Disability options now differ at age 65, reflecting differences in earnings under these options between ages 60 and 65.

The lifetime income from age 60 is greater under each option for the worker with rising earnings than for the worker with steady earnings because both the wage-rate and pension-benefit levels are greater for the former. The Disability option has the lowest cost of leisure for this worker as it did for the steady earnings worker. This cost is almost 60 percent of the wage rate, however, whereas it was only about 30 percent of the wage rate for the steady worker in case 1. The costs of leisure for the other three more-leisure options are also higher, relative to the wage rate, for the worker with rising earnings. These higher costs of leisure imply that this person will be more likely to work past age 60 than will a person with steady earnings.

A worker with falling earnings. Case 6 in table 3 shows a worker whose wage rate has fallen to \$5.00 per hour at age 60 where it will remain until the individual retires. The worker is assumed to have earned an average of 3.0 pension points in the 15 highest earning years. Like the worker with steady earnings and unlike the short-service worker and the worker with rising earnings, the pension level of this worker will not be affected by the amount the individual works between ages 60 and 65.

The replacement rates for the worker with falling earnings are higher than those for the worker with steady earnings since the end-of-working-life earnings are below the individual's average earnings. Since the individual's wage rate is lower, the income from age 60 is lower under all options involving work than was the case for the average worker with steady earnings. The incomes from age 60 for the individual's no-work options are the same, however. In this example, as in most other examples studied, the high-income option is Normal Retirement. The falling wage rate for this worker has increased the income from age 60 of all other options relative to the high-income option. As a result, the costs of leisure for the more-leisure alternatives are a relatively lower portion of the wage rate for this falling-earnings worker than they were for the average worker with steady earnings in case 1. The average cost of leisure for the Disability option is only 18 cents per hour.

¹³ This example assumes a mature earnings-related pension system, an event that will not occur until 1990. In 1982, a retiree needs only 22 years with pension points to receive a full earnings-related pension.

¹⁴ The Disability option is only available to those who face rather severe constraints on their ability to supply labor to the marketplace; those receiving a Disability pension do not make this choice from a set of unconstrained alternatives.

This fact implies that older Swedish workers facing a reduction in their wage rates may have an incentive to become, and remain, unemployed in order to qualify for Disability benefits under the long-term unemployment provision. The Swedish government has found no evidence that workers are using such a strategy, however.

Summary of Findings

The above examples have shown that:

- Workers with short service (case 4) and with rising wages (case 5) have the greatest incentive for working between ages 60 and 64 because such work effort will increase their pensions after age 65. Short-service workers gain a year with pension points and thus reduce the amount their pensions are decreased because of having less than 30 years with pension points. Workers with rising wages replace a year of lower pension points with a year of higher pension points for each year worked between ages 60 and 65. Obviously, the more these rising wage earners work, the higher will be their average pension points and thus their pension levels at age 65.
- Workers facing falling wage rates (case 6) have the least incentive to work past age 60.
- The Early Retirement option is the least desirable alternative under each of the three measures of relative attractiveness.
- The relative attractiveness of the six pension-work alternatives is sensitive to the assumptions made about life expectancy, discount rates, and earnings patterns.

Replacement rates, income from age 60, and the average cost per hour of leisure give some indication of the relative attractiveness of the various pension alternatives to the Swedish worker. These measures are not sufficient to allow one to unambiguously determine which alternative any given worker will select. The choice a worker will actually make depends on the individual's health, preference for leisure, net worth, private pension income and other unearned income, family size and the degree of family dependency, and perhaps even other factors. The purpose of these examples is only to illustrate the financial trade-offs among work, leisure, and pensions under options available in the Swedish pension system.

Actual Experience

About 60 percent of all Swedes—half the men and two-thirds of the women in the age 60–64 range—were receiving some kind of a pension in January 1981 (table

4). It is interesting that the percent taking the various more-leisure options follow the cost of leisure orderings for the average, steady-earnings worker. The Disability option was found to be the least costly leisure alternative. Twenty-five percent of all Swedes aged 60–64 receive a Disability pension even though the eligibility requirements are such that they restrict the number of persons eligible to receive it. The Partial Pension options were the next least costly, and 14 percent of the Swedes in the 60–64 age range had partial pensions. Only 3 percent of this age group selected the Early Retirement option, the most expensive in terms of the cost of leisure.

Swedish Experience with Partial Pensions

The Swedish partial pension system took effect on July 1, 1976. Almost 480,000 persons aged 60–64 were then living in Sweden, but only 200,000 of them were eligible to receive a partial pension. Of those ineligible, about 220,000 were not in the labor force; 35,000 were ineligible because they were self-employed; and 25,000 were ineligible either because they did not have 10 years of pensionable income from age 45 or because they were not working at least 22 hours per week. The self-employed became eligible to receive partial pension benefits on January 1, 1980. The number of persons aged 60–64 eligible for partial pensions is expected to remain about 240,000 for some years to come.

The number of persons receiving partial pension benefits has increased steadily since the system was inaugurated. By the end of December 1976, after the program was in place for only 6 months, almost 15,000 persons had been awarded partial pensions. An estimated 68,000 workers were receiving partial pensions in May of 1981—about 28 percent of all eligible workers or 14 percent of the population aged 60–64. About 500 individuals apply for partial pensions each week. The partial pension originally replaced 65 percent of the income loss sustained when a wage or salary employee transferred to part-time work, but because of financing deficits in the

Table 4.—Percent of Swedes aged 60–64 receiving pensions, January 1981

Type of pension	Total	Men	Women
Total with pension	60.1	51.1	68.7
Disability	25.0	27.9	22.4
Reduced Pension	2.8	3.0	2.6
Partial Pension	14.3	20.2	8.8
Widow's Pension	6.9	.0	13.4
Wife's Supplement	11.1	.0	21.6
Not receiving a pension	39.9	48.9	31.3

Source: Swedish Embassy, Washington, D.C.

system, the replacement rate was reduced to 50 percent for those who filed for partial pension benefits after December 31, 1980. The announcement in the fall of 1980 that these benefits would be reduced caused the number of applicants to triple until the end of 1980.

By early 1981, about 1 year after they were included in the program, only 5 percent of the eligible self-employed were receiving partial pensions. This percentage may rise over time, but it is not expected to approach the 33-percent participation rate of the wage and salary workers since, in order to qualify, the self-employed must reduce their work effort by at least 50 percent, yet average at least 17 hours per week. Wage and salary workers, on the other hand, can qualify if they reduce their work effort by as little as 5 hours a week as long as they continue to work an average of at least 17 hours per week.

Although wage and salary employees may reduce their work week by as little as 5 hours, the great majority (75 percent) have chosen to reduce their work from full time to half time. Working alternate weeks appears to be the most common way of reducing work time. Other ways include working fewer 8-hour days per week or working fewer hours per day.

It does not appear that workers desiring to partially retire have had any trouble converting to part-time employment. Less than 1 percent were denied part-time work by their employers.¹⁵ The ease of finding part-time work resulted from a general rise in part-time employment during the 1970's and from the recession in Sweden during the late 1970's. Many firms, especially those in the commodity manufacturing sector, used the partial retirement of their older workers as a means of reducing employment in times of economic hardship. About half the hours lost due to the partial retirement of workers were not made up by new hires. Thus, the partial retirement system allowed employers to reduce their work force by the equivalent of 10,000-14,000 full-time workers by May 1981.¹⁶

A 1978 survey of partial retirees found that they were generally quite pleased with their lives and that the slight reduction in income did not cause any financial hardship. Further, it was found that the health of partial pensioners deteriorated less over the 1976-78 period than did that of samples of full-time employees and disability pensioners.¹⁷

Another study found that many employers have been eager to utilize the partial retirement of their older employees as a means of reducing labor costs in the current

recessionary period.¹⁸ Most employers do not think that production will be adversely affected by partial retirements since they believe part-time employees often produce more per working hour than full-time employees. From the point of view of employers in this study, the main drawback of partial retirement centered around the distribution of working hours. Apparently, there was some conflict between the preferences of management and those of partial retirees—especially in firms whose production involved shift work.

Overall, these studies seem to indicate that the Swedes are pleased with their partial pension scheme. Workers are satisfied since the program allows them to gradually reduce their work effort without a great percentage reduction in their income. Employers have been satisfied for the most part since the program allows them to lower their labor costs in a recessionary period. Whether they will be as satisfied once the current recession ends remains to be seen. The financing problems that were caused by underestimating the popularity of the system were temporarily corrected by doubling the tax rate on employer payroll and by reducing the replacement rate on lost earnings for employees who opted for the Partial Pension alternatives after January 1, 1981. Currently, the program is again in deficit and payroll tax revenues are now being supplemented from general tax revenues.

Summary

The Swedish national pension system offers a variety of retirement options for its workers. One significant and innovative feature of the system is the Partial Pension scheme that permits a worker who reaches age 60 to reduce the number of hours worked and receive half the lost earnings back from the government in the form of a special pension benefit. To qualify for a partial pension, the worker must meet certain work-related eligibility requirements. The worker must have pension points for at least 10 of the preceding 15 years, have worked for at least 5 of the preceding 12 months, and have worked an average of at least 22 hours per week. Only about 40 percent of the nonself-employed Swedes aged 60-64 meet these work-related requirements. The partial pension scheme has been very popular, and about one-fourth of the eligible workers—or 14 percent of the entire Swedish population aged 60-64—are receiving partial pensions.

The worker wishing to obtain a partial pension also faces some nonwork-related constraints. The individual must secure employer approval (and in some cases union approval) before beginning work part time. Most employers in Sweden have willingly made part-time jobs available to their older workers. There is some indication that employers have used the partial pension

¹⁵ Goran Crona, *Partial Retirement in Sweden*, a paper presented at the XII International Congress of Gerontology, Hamburg, West Germany, July 12-17, 1981.

¹⁶ The 10,000-14,000 worker reduction is based on the assumption that partial retirees reduce their work by an average of 12-15 hours per week.

¹⁷ Goran Crona, *op. cit.*

¹⁸ Goran Crona, "Partial Retirement in Sweden: Development and Experience," *Aging and Work*, spring 1980, pages 113-120.

scheme as a means of reducing their labor costs in a period of recession. It remains to be seen if they will voluntarily offer part-time employment to their older workers in periods of tight labor markets.

Swedish workers not receiving partial pensions have two other alternatives for receiving pensions between the ages of 60 and 64: (1) They can receive disability benefits if they are disabled or if they are unemployed and have exhausted their unemployment benefits, or (2) they can also receive actuarially reduced pensions. Workers can receive half their pension benefits before age 65 at an actuarially reduced rate and receive the other half unreduced at age 65. Only about 3 percent of Swedes aged 60-64 select reduced pensions.¹⁹ The analysis in this article suggests that this low acceptance rate results from the existence of better pension options in the form of partial pensions and disability pensions. The disability pension eligibility requirements are liberal enough that 25 percent of Swedes aged 60-64 are receiving such pensions.

Between 40 percent and 45 percent of the Swedes aged 60-64 receive disability, partial pension, or reduced pension benefits. Not all of the remaining 55-60 percent are eligible for pensions before age 65. Some are dependent spouses of workers and as such are eligible for benefits only under the demogrant portion of the Swedish national pension system. Most of the others will begin receiving pension benefits at age 65. Less than 1 percent defer receipt of their pension past age 65, even though

¹⁹ It is not clear whether this 3 percent includes those who accept any reduced pension benefits or only those who accept their full pension at a reduced rate.

there is no earnings test and benefits are increased by 7.2 percent for each year of deferral.

Financing for the Swedish national pension system comes basically from employer contributions. For 1982, the contribution rate for the demogrant and earnings-related pension is 17.85 percent of total payroll for all workers aged 65 and younger. These contributions are supplemented by government appropriations to the demogrant program. The partial pension system is financed separately with an employer contribution of 0.5 percent of total payroll for all workers aged 65 and younger. Currently, these contributions are also being supplemented by government appropriations.

The Swedish national pension system differs considerably from the U.S. Social Security system. The Swedish system offers more retirement options and in many ways its eligibility criteria are less restrictive. For instance, old-age benefits can be received at age 60 in Sweden whereas in the United States, the minimum age for retirement benefits is 62. Also, the Swedish disability eligibility requirements are quite relaxed compared with those of the United States. The cost of the Swedish national pension system, including government subsidies, is over 20 percent of total payroll. By comparison, the cost of the U.S. Old-Age, Survivors, and Disability Insurance program in 1982 is 10.8 percent of taxable payroll. In addition, all earnings from covered employment in Sweden are subject to the payroll tax, whereas in the United States, only 91 percent of earnings from covered employment are taxable. Thus, in terms of total payroll, the Swedish system costs roughly twice as much as the U.S. system.