

Department of Pension Development
Tommy Lowen, Ole Settegren
+46-10-454 20 50

Comments on the OECD's Calculation of the Future Pension Level in Sweden

"Pensions at a Glance 2011" is a comprehensive, well-prepared report by the OECD comparing the pension systems of different countries. The report is devoted in part to the measure known as the replacement rate, defined as the ratio of an individual's pension at age 65 to her/his earned income at age 64. The purpose of this memorandum is to compare the OECD's calculations of the average replacement rate before taxes with the Swedish Pensions Agency's own calculations and to attempt to explain any differences in the results. Different calculations can naturally lead to different results, but there should be no differences that cannot be explained. We would therefore like to discuss with the OECD the differences in the calculation results and any other issues that may make it harder to provide fair comparisons between countries.

Realizing how difficult it is to make relevant comparisons between countries, the Swedish Pensions Agency finds that the OECD has clearly succeeded in this respect in its publication "Pensions at a Glance," despite the shortcomings noted here. The publication will be a valuable aid to everyone engaged in the field of pensions in much of the world.

Summary

The OECD,¹ like the EU Commission,² has published analyses of expected pension levels in their respective member countries. Of the many measures used by organizations, the one referred to as the "replacement rate," or pension (public pension and occupational pension) in proportion to final earnings, is the one most widely referred to in Swedish media. The replacement rate is calculated for a typical-case individual who retires at age 65. In the OECD's calculations, this individual is born in 1988, and in the Commission's calculation, in 1982. In a report by the Commission, the replacement rate in these typical cases has been estimated at just over 48 percent, and in a subsequent report at almost 52 percent. In the OECD's example the ratio is nearly 54 percent.³ In the calculation of the Swedish Pensions Agency for the equivalent typical cases, it is slightly above 62 percent.

In this memorandum we have compared our own calculations primarily with those of the OECD. The reason is that the OECD's calculation is most recent and that the OECD, unlike the Commission, presents its findings separately for the national public pension and the occupational pension. This makes it easier to compare the findings. Moreover, the difference between the Commission's latest calculation and the OECD's is so slight as to be of minor interest. In our view, the reason for the difference between the OECD's calculation and our own also explains the difference in relation to the Commission's calculations.

The results of the OECD's calculations differ from those of the Swedish Pensions Agency largely because the OECD apparently does not consider the economic adjustment norm in the inkomstpension system. As an effect of this norm, the annuity divisor is lower, and the initial pension higher. Table 1 provides some comparisons of key numbers between the OECD's calculations and those of the Agency.

¹ Pensions at a Glance 2011, Retirement-Income Systems in the OECD and G20 Countries

² Commission: EUROPEAN COMMISSION "EPC-SPC Joint Report on Pensions Country Profiles", Brussels 29/10 - 2010

³ Table, page 119, "Gross pension replacement rates by earnings"

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Table 1. Summary, Comparison of Replacement Rates, OECD and Swedish Pensions Agency

	OECD	a) Pensions agency	b) OECD, adjusted*	Unexplained difference (a-b)
Pension in % of final earnings in 2053 at age 65	53.8	62.5	62.7	-0.2

* The Swedish Pensions Agency's annuity divisors and inheritance gains factors have been used in the OECD's model.

From the table above it can be seen that the unexplained difference is 0.2 percentage point. The difference is negligible for purposes of this memorandum. An appendix provides a simplified overall calculation that confirms a replacement rate of around 62-63 percent.

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Purpose of the Memorandum

The purpose of this memorandum is to compare the OECD's calculations of the average replacement rate before taxes with the Pension Agency's own calculations and to seek to explain any differences in results. It is natural for different calculations to yield different results, but there should be no unexplainable differences. If any such differences are found, we shall contact the OECD in order to join them in searching for an explanation. The Swedish Pensions Agency realizes how difficult it is to make relevant comparisons between countries and considers that the OECD has been quite successful in doing so in its publication "Pensions at a Glance," despite the shortcomings mentioned here. The publication will be very useful to everyone engaged in the field of pensions throughout much of the world.

Criticism of Replacement Rate as a Measure

In an analysis presented in September, 2010,⁴ the Swedish Pensions Agency showed that the measure known as the "(average) replacement rate" is highly sensitive to the choice of assumptions for the calculation. In the analysis it is also shown that the distribution of the actual replacement rate, that is, the replacement rates for actual individuals in relation to the average replacement rate for these individuals, is considerable. As an indication of the degree to which the average replacement rate is problematic as a measure, it may be noted that for over 25 percent of the individuals in annual birth cohort 1939 who began drawing a pension at age 65 (in 2004), the replacement rate exceeded 100 percent of their average income at ages 60-64. In the calculation, only the national public pension, not the occupational pension, was included.

In light of the analysis above, the Swedish Pensions Agency has shown that the *average replacement rate* is inappropriate as a measure for informing ensured individuals about the change in income that they can expect when they retire from working life and. Those wishing to obtain an idea of the size of their expected future pension should turn to www.minpension.se. There a pension projection is made for the individual's national public pension and occupational pension as well as certain private pension saving.⁵ In such cases, when a single "number" is shown to indicate the pensioner's expected average replacement rate, it is important to inform people on such matters as the possible inaccuracy of the calculations for individuals.

To focus only on gross pension in relation to final earnings often results in a misleading impression of living standards in the typical case before and after retirement. Considering disposable income will provide a more accurate picture of the change in purchasing power when the individual retires. For this reason the OECD also includes calculations of the replacement rate after taxes. The purpose of this memorandum, however, is solely to compare the OECD's calculations of the magnitude of a pension with those of the Swedish Pensions Agency. For this purpose, it will suffice to consider the calculation of replacement rate before taxes.

One difficulty with using the replacement rate to describe the change in living standards after retirement – whether the replacement rate applies to income before or after taxes – is that the expenses to be financed by the individual's earnings and pension, respectively, also change at retirement. Retirement probably makes it easier to reduce one's own living expenses, partly because of a decrease in work-related expenditure; moreover, certain discounts are available, on travel for example. On the other hand, some expenditure, such as for health and other care, may be higher.

⁴ <http://www.pensionsmyndigheten.se/3129.html>

⁵ Certain quality defects remain in www.minpension.se. As a result, not all hourly employees are given an accurate pension forecast there. The principal shortcomings in quality concern the agreement for municipal and county employees.

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The Calculations

The OECD has calculated pensions in proportion to final earnings for Sweden and other OECD countries⁶. The calculations are based on national legislation and labour-market agreements for 2008. For Sweden, the OECD estimates that the ratio of pension before taxes (sum of the national and occupational pensions) to final earnings before taxes is 53.8 percent. This ratio can be compared to 57.3 percent, the unweighted average for the entire OECD area. The proportions have been calculated for typical cases said to represent the average for the respective country but with the following assumptions that are the same for all countries:

- Inflation is 2.5 percent per year.
- Earnings increase in real terms by 2 percent per year. This means that the nominal increase is assumed to be 4.55 percent per year.
- The real annual return after contributions is 3.5 percent. This means that the nominal annual return is assumed to be 5.57 percent and that the real return exceeds real growth in incomes by 1.5 percentage points. (The amount of this “excess return” is important for determining the replacement rate for the portion of pensions that depends on the rate of return).
- The calculations refer to single men.
- The rules for pensions and taxes are those applicable in 2008.

For Sweden the facts in the typical case are the following:

- The individual is born in 1988 and retires in 2053 at age 65.
- He works for 45 years after entering the labour market in 2008 at age 20.
- He works in the private sector, with initial annual earnings of SEK 352 470 (just above SEK 29 370 /month) at the level of earnings in 2008. His earnings correspond to the average earnings for all men in 2008.⁷
- Working in the private sector, he is assumed to receive an occupational pension under the provisions of the ITP Agreement (the Supplementary Pension for Employees in Industry and Commerce, ITP 1). He draws an occupational pension for the rest of his life.

These assumptions are largely the same as for all other OECD countries, though with certain differences.

The Commission has also reported the ratio of pensions to final earnings for Sweden and other European countries.⁸ For Sweden the ratio is found to be 51.6 percent. The Commission’s assumptions underlying the calculations, however, differ somewhat from the OECD’s. The Commission’s assumptions are presented in Appendix 2.

Table 2 shows some comparative key numbers for the respective calculations of the OECD and the Swedish Pensions Agency.

⁶ OECD, ”Pensions at a Glance 2011”,

http://www.oecd.org/document/49/0,3746,en_2649_34757_42992113_1_1_1_1,00.html

⁷ The average pension-qualifying income in Sweden in 2008 was SEK 18 600 per month, considerably less than the average income of a full-time employee in industry. Some of the difference is explainable by part-time work.

⁸ EUROPEAN COMMISSION “EPC-SPC Joint Report on Pensions Country profiles”, Brussels 29/10 -2010. The underlying assumptions and the method used in the cases are presented in the following appendix:

<http://ec.europa.eu/social/BlobServlet?docId=4307&langId=en>

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Table 2. Some Comparative Key Numbers for the Respective Calculations of the OECD and the Swedish Pensions Agency

Demography:	OECD	Agency
Life expectancy after 65		
Women	23.8	23.12
Men	20.7	21.20
Pension system		
Annuity divisor, inkomstpensionen (IP)	21.97*	18.35
Annuity divisor, premium pension (PP)	17.48*	15.93
Inheritance gains adjusted for costs of administration, IP	2.2%*	3.6%
Inheritance gains adjusted for costs of administration, PP	0%**	0%

* As shown in the OECD's model. **No inheritance gains factor included in the model; it is implicitly 0 percent. In the Swedish Pensions Agency's model, inheritance gains before costs of administration are almost five percent, but approximately 0 percent after those costs. In the Swedish Pensions Agency's calculation for the premium pension, the annuity divisor applies to fund insurance with no survivor benefit.

In addition to the above-mentioned "gross" replacement rate before taxes, the OECD and the Commission also calculate the replacement rate after taxes. For Sweden the OECD calculates that the net replacement at age 65 is 53.6 percent given the tax provisions for 2008. The Commission finds it to be 54.7 percent under the tax rules for 2006. Thus, the replacement rate calculated by the OECD, based on after-tax income, is slightly less than the replacement rate before taxes; the reason is that with the tax credit on earned income, introduced in 2007, earned income is less heavily taxed than pensions. The Commission's calculations result in a higher replacement rate after taxes than before taxes because those calculations are based on the rules applicable in 2006. In the Swedish Pension Agency's model, by contrast, the current rules (2011) apply, and the replacement rate after taxes, like the OECD's rate, is somewhat lower because of the tax-credit on earned income (jobbskatteavdraget).⁹

With the same assumptions for the economy (growth, return, inflation, the growth profile of individual income) as those used by the OECD, the Swedish Pensions Agency calculates that the pension (national public pension and occupational pension) before taxes is 62.5 percent of final earnings. This is almost nine percent higher than the rate reported by the OECD. The explanation for this substantial difference is probably that the OECD does not consider the economic-adjustment norm in the annuity divisor for the inkomstpension¹⁰. The annuity divisor is used to convert pension capital into a lifetime stream of monthly

⁹ As a pensioner at age 65, the individual must wait until age 66 to take advantage of the increased basic deduction in the income taxation of older individuals, since only persons who have reached age 65 by the start of the year are eligible for the deduction.

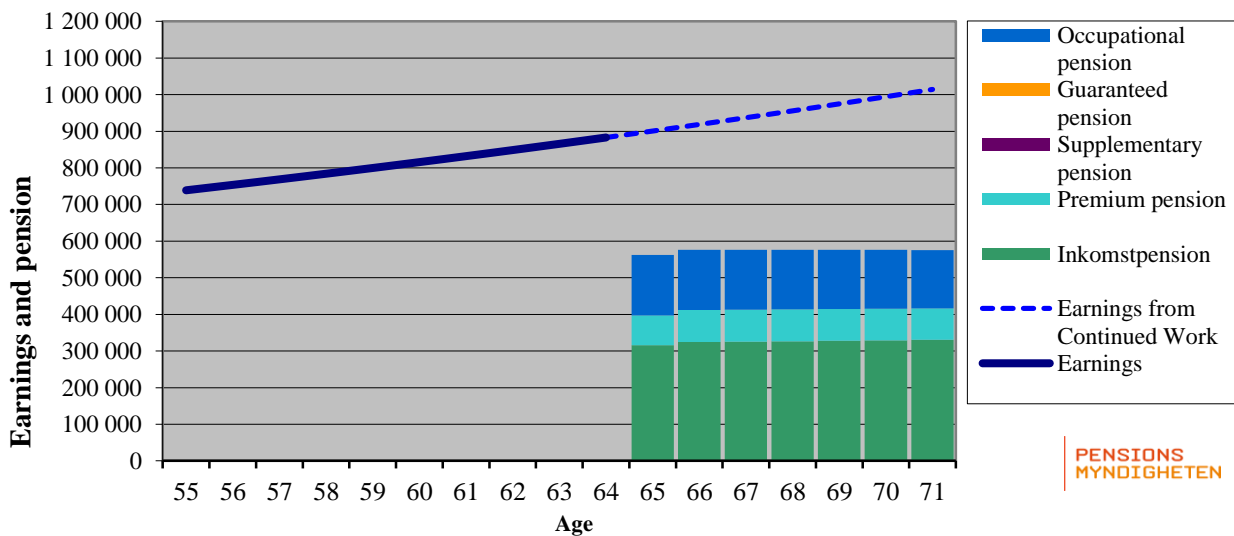
¹⁰ In the pension model of the OECD, which has been made available to the Swedish Pensions Agency, the annuity divisor is shown to be 21.97 for the inkomstpension system and 17.48 for the premium pension system. In our calculations, which are based on the population projections of Statistics Sweden (SCB) and of the Agency, the annuity divisor for the inkomstpension is 18.35 and for the premium pension, 15.93, for an individual born in 1988 and retiring at age 65. The annuity divisor of 21.97 in their model probably reflects remaining life expectancy without regard to the economic adjustment norm of 1.6 percent. For the inkomstpension in their model, the accumulated inheritance gains, adjusted for costs of administration, are about 2.2 percent, which may be compared with our calculation of some 3.6 percent. No inheritance gains for the premium pension are provided in the OECD's model, but, they are largely of the

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pension disbursements. The annuity divisor is calculated on the basis of assumptions about mortality and a projected rate of interest. For the inkomstpension the projected rate of interest is 1.6 percent. In the Swedish Pensions Agency's calculation, it is assumed that mortality and the projected rate of interest are the same for the premium pension and for the occupational pension (ITP1), or approximately 3.5 percent. We do not know how the OECD addresses these situations since the annuity divisor for the premium pension is different from the assumed interest rate of 3.5 percent.

The figure below shows how gross income (earnings and pension at 2010 price levels) changes annually between the ages of 55 and 71 in the Swedish Pensions Agency's calculation.

Figure 1: Earnings and Pension before Taxes, and Contributions from Ages 55 to 71, Expressed in 2010 Price Levels with the OECD's Assumptions



As noted, the calculations include an occupational pension in the form of a simplified model for the ITP1. If the occupational pension is received for a shorter period, such as five years, rather than for life, the initial pension will be higher in relation to final earnings.

With a straight-line income profile, that is, where the individual's earnings each year grow at the same rate as the average income, as is assumed by the OECD, it is reasonable to compare the pension with final earnings. It is not uncommon, however, for older people to reduce their working hours and earnings before retirement;¹¹ growth in hourly earnings may also be weaker for older individuals. With such an income profile, which is typical in Sweden, the replacement rate is higher, since the pension is compared with lower final earnings. In order to avoid overstating the replacement rate, it is common in such an analysis to compare the pension with the average income (in constant prices), for the last four years, for example, instead of comparing it with final earnings. It can be seen in the diagram that the pension is slightly lower at age 65 than at age 66, as an effect of the taxation process.¹² The table shows earnings in 2010 prices and as a share of final earnings.

same magnitude as the costs of administration. If the OECD model is adjusted for the data forecast by the Swedish Pensions Agency, the results agree.

¹¹ Or that growth in earnings slowed in the years before retirement. The income profile for the economically active years is probably more concave.

¹² The time lag in the taxation of incomes means that there is also a time lag in pension credit. Thus, the pension credit for the year t is not known until the end of year $t+1$. This final pension credit is included in the tables.

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Table 3. Earnings at Age 64 and Pension at Age 65 in 2010 Prices, per Month

	2010 prices	In pro- portion to final earnings	Calculated proportion, OECD	Adjusted proportions, OECD ^Δ
Earnings at age 64, SEK				
Final earnings	73 800	100.0%	100 %	100 %
Pension at Age 65, SEK^γ				
Gross income	46 100	62.5%	53.8%	62.7%
Of which national public pension	34 500	46.8%	39.6%	47.2%
of which inkomstpension	27 700	37.6%	31.1%	37.8%
of which premium pension	6 800	9.2%	8.5%	9.4%
of which guaranteed pension	0	0.0%		
Of which occupational pension	11 600	15.7%	14.5%	15.5%

^γIncl. pension credit earned at age 64

^ΔIn regard to annuity divisor and inheritance gains

Note: Amounts in the table are rounded off; thus, the sum of the subtotals does not necessarily agree with the total amount. The reason for the high monthly income of SEK 73 800 is that earnings are assumed in the calculation to increase by 2 percent each year.

The table shows that if the OECD's calculations are adjusted for annuity divisors and inheritance gains in accordance with the population projection of Statistics Sweden (SCB), the total result will be largely consistent.

How Much Is the Pension Increased by Working Longer?

To some extent, though not completely, a pension saver may decide when to retire. The freedom to affect the time of retirement varies from individual to individual and from employer to employer. In Sweden the employer may refer to age as a reason for terminating the employment contract, but not before age 67. The OECD, however, uses 65 as the retirement age in Sweden, one reason being that the guaranteed pension cannot be paid until that age. In cases where the individual may decide when to retire, the replacement rate can be increased by waiting longer before drawing a pension. The choice between pension (leisure) and additional consumption has been studied by economists and is based on the theory of labour supply. Briefly, the theory assumes that the individual chooses what is of greatest utility to her/him.¹³ Nowadays relatively few people continue working after age 65. In the choice between continuing to work and retiring, the individual's personal health is a highly significant factor. For couples, the decision will probably take the partner's situation into account as well. In addition, norms – or generally accepted views in society about what is "normal" – probably have a considerable impact on retirement behaviour, as do the rules for the national public pension and the occupational pension.

The OECD's report studies the changes in pension wealth in proportion to average incomes as an indicator of the profitability of postponing retirement. Pension wealth is the total of all pension incomes during a pensioner's expected lifetime, discounted by 2 percent. For Sweden, pension wealth is increased 4.2

¹³ An increase in income from capital, or other income that is not dependent on the number of hours worked, will normally lead to increased leisure, the so-called income effect. An increase in earnings or a decrease in taxes will also produce an income effect, but at the same time it will be "more expensive" to refrain from work to obtain more leisure. This so-called substitution effect tends toward less leisure and more time spent working. Which of the income and substitution effects will predominate depends on individual preferences.

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percent by continuing to work, according to the OECD (Table 3.2 page 57). How much higher the pension will be for postponing retirement is otherwise not shown in Pensions at a Glance 2011.

In the OECD report "Decomposing Notional Defined-Contribution Pensions,"¹⁴ it is calculated that in the Swedish pension system, the pension of a typical-case individual will be about 5-6 percent higher as a result of working longer. The OECD's pension model has been used for the calculation. The Swedish Pension Agency's calculation in the previous example concluded that the pension (in SEK at 2010 prices) would increase by about 8.3 percent and by 5.8 percent in relation to final earnings. Previously the OECD calculations disregarded the fact that that in Sweden's national public pension system new pension credit is earned as long as the individual keeps working, no matter what her/his age. In this regard Sweden differs from most other OECD countries and also from several occupational pension schemes. Now, however, the OECD's calculation happily appears to allow for the fact that new pension credit is earned in the national system after age 65 as well.

In our calculation below, we have assumed, like the OECD, that the typical-case individual will not receive new contributions to the *occupational* pension after age 65. In the ITP1 scheme, the employer, by agreement, may continue to pay premiums after the individual turns 65, but the employee is not entitled to this benefit under the collective agreement. Even so, postponement of an occupational pension, whether premiums continue to be paid or not, will still result in a higher pension; pension capital will earn a return for an additional year, there will be an additional year of inheritance gains and the annuity divisor will be lower. Table 4 shows the calculated effects when the typical-case individual works for an additional year and when he/she retires at the age of 68 years and four months. The reason why 68.3 has been chosen is that the Swedish Pensions Agency in its Annual Report (2010) calculated that 68.3 years was the retirement age required for an individual born in 1990 to receive the same pension as he/she would have received at age 65 if life expectancy had not increased from the time when life expectancy began to affect the magnitude of the monthly pension.¹⁵

Table 4. Gross Replacement Rate at Different Retirement Ages

Replacement rate:	Retirement at age 65	Retirement at age 66	Retirement at age 68.3
Total pension	62.5%	66.0%	75.5%
Of which national pension	46.8%	49.6%	57.4%
of which inkomstpension	37.6%	39.9%	46.2%
of which premium pension	9.2%	9.7%	11.2%
of which guaranteed pension	0.0%	0.0%	0.0%
Of which occupational pension	15.7%	16.3%	18.0%

Note: The gross rate is the pension in proportion to final earnings. Earnings are assumed to increase by 2 percent per year in real terms.

The pension in monetary terms is increased by over 10 percent and over 40 percent, respectively, by working for an additional year or 3.3 years. In 2010 prices the pension will increase by almost 8 percent and about 30 percent, respectively, since earnings will also have increased during the prolonged period of

¹⁴White House, OECD Social, employment and migration working papers no. 109 (2010), Table A1

¹⁵ The principles for pension reform were adopted by Sweden's Parliament in 1994. For this reason, the actual and projected increases in life expectancy since that time have been used in calculating the "life-expectancy-neutral" pension age for the typical-case individual, who was born in 1988.

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working life. Expressed in proportion to final earnings, the pension increases by 5.8 percent and about 21 percent, respectively.

In Sweden, retiring later results, as noted, in a higher pension for four different reasons: Growth in the pension balance as new pension credit is accumulated (though this does not necessarily apply to the occupational pension and the ITP 1 plan¹⁶), additional interest on pension capital earned,¹⁷ a lower annuity divisor¹⁸ and additional inheritance gains. The effect of these four factors can also be easily calculated in the case where a typical-case individual's income is assumed to increase at the general rate of growth in incomes.

Table 5 below provides a simplified calculation of the change in pension resulting from postponing retirement one year at age 66.

Table 5. Simplified Calculation of the Increase in Pension in Proportion to Final Earnings Resulting from Working One Additional Year from Age 64 to Age 65

	IP	PP	ITP
Divisor(65)	18.35	15.93	15.93
Divisor(66)	17.74	15.53	15.53
a) Change in divisor	3.4%	2.6%	2.6%
b) Inheritance gain(65)	0.5%	0.3%	0.00%
c) Cost of administration	0.0%	-0.2%	0.00%
d) New pension credit*	2.2%	2.2%	0.00%
e) Excess return	0.0%	1.5%	1.5%
Total (a-e)	6.3%	6.6%	4.1%

The total is the product of percentage changes a-e.

IP = inkomstpension, PP = premium pension, ITP = occupational pension

* refers to pension credit earned in the additional year of work in proportion to pension capital at the beginning of the additional year. With a straight-line income profile and if the effect of the "excess return" is disregarded, this credit can be calculated as 1/number of working years prior to the extra working year. In the example this is $1/45 = 2.2\%$. In a defined contribution pension system, the same pension credit will result in the same additional pension in monetary terms regardless of previous income history, but the percentage increase will differ depending on previous income history. In a defined benefit system the opposite is often true – the pension from postponed withdrawal is increased by the same percentage, but by a differing amount in monetary terms.

Given the highly positive trend in life expectancy that we have experienced and that most analysts believe will continue in the period ahead, it is our opinion that it would be useful if the OECD (like the EU) extended its calculations in the future to cover pension levels at a retirement age above 65. As is shown in

¹⁶ In the ITP1 scheme the employee may agree with the employer to continue payment of premiums if the employee still works after age 65. Different occupational pension agreements are governed by different rules. In our calculations no occupational pension credit is earned after age 65.

¹⁷ The inkomstpension grows by the income index, and the premium and occupational pensions by the return on capital.

¹⁸ The annuity divisor in the inkomstpension system is equal to remaining life expectancy adjusted by the economic adjustment norm of 1.6%. In the premium pension system, remaining life expectancy is adjusted for the estimated return on the pension asset. The projected annuity divisor for birth cohort 1988 is decreased in the inkomstpension system from 18.35 percent to 17.74 percent through postponement of retirement for one year, from age 65 to age 66, and this adjustment in itself increases the inkomstpension by about 3.4 percent.

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Table 4, the replacement rate in a typical case in Sweden is calculated to be nearly 76 percent of final earnings if the retirement age is adjusted for the tendency of life expectancy.

In many OECD countries the pension system is currently underfinanced. Normally the single most important reason for this is the increase in life expectancy. It would be desirable to describe the stability of the pension system of different countries so as to indicate whether the replacement rates presented will be sustainable in the future if there is no redistribution or growth. It may be mentioned that in the Swedish pension system pensions decrease automatically, via a new and higher so-called annuity divisor, for new pensioners if life expectancy increases. This means that there is a financial incentive for the insured to retire at a later age after the increase in life expectancy. This method is an alternative to increasing the formal retirement age. The OECD recommends a higher formal retirement age. Regardless which of these two methods is chosen by member countries, it is important that the OECD in its analyses capture the incentives for postponing retirement in different pension systems.

In conclusion, we at the Swedish Pensions Agency would like to add a final comment by thanking the OECD for a job very well done. The publication "Pensions at a Glance" is worthy of its title – it provides a quick and excellent overview of the pension systems in different countries. However, we urge other countries to review the OECD report for their own benefit so that any remaining shortcomings may be corrected, thus making "Pensions at a Glance" even better, if possible.

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Appendix: The Swedish Pension System, a Simplified and Transparent Calculation of the Replacement Rate

For individual's born in or after 1954, the "Swedish pension system" can be considered to consist of the inkomstpension, the premium pension and the occupational pension. In the OECD's calculation the rules of the ITP1 scheme are used in describing the occupational pension. All of these three pension forms are of the defined contribution type.

Inkomstpension (IP):

The contribution is 16 percent of pension-qualifying income or, since the individual social security contribution of 7 % does not result in pension credit, 14.88 percent [=16*0.93] of income up to the contribution ceiling of 8.07 income-related base amounts. The contributions are set aside annually and are revised upward annually by the change in the income index. The pension balance then consists of the pension credit recalculated by the income index, with the addition of inheritance gains and deduction for costs of administration. The pension at the time of retirement is calculated by dividing the pension balance by an annuity divisor which reflects both remaining life expectancy and an advance or forecast interest rate of 1.6 percent. The pension is then recalculated annually by the income index after deduction of (division by) the interest credited.

Premium Pension (PP):

A contribution of 2.325 [=2.5%*0.93] percent of income up to the income ceiling of 8.07 income-related base amounts is set aside and earns interest at the rate of return on capital. The pension at retirement is calculated in a manner analogous to the rules of the inkomstpension scheme but with an estimated return/interest of 3.5 percent in these calculations, and with the premium pension disbursed as fund insurance without a survivor benefit.

Occupational Pension (ITP 1):

The contribution to the ITP, 1 – 4.5 percent of earnings up to 7.5 income-related base amounts and 30 percent of the portion of earnings exceeding 7.5 income-related base amounts, is set aside and funded. The employer pays the premiums, and the amounts set aside start to accumulate for the employee beginning with the month when he/she reaches age 25. In the typical case this will result in 40 years of paid-in premiums, thus differing from the assumed 45 years of paid-in contributions in the IP and PP schemes. In the typical case there is only income under 7.5 income-related base amounts. The calculation of the pension has been simplified here by applying the same annuity divisor as for the premium pension.

The Replacement Rate: Pension in Proportion to Final Earnings – a Simple Rule-of-Thumb Calculation:

In the OECD's typical case the man is assumed to work for 45 years and to have the same earnings in relation to the average income for his entire working life, or a so-called straight-line income profile. In the new pension system and in the ITP1 scheme, the replacement rate for a person with a straight-line income profile is calculated according to the following simplified expression:

IP:

Number of years * Annual contribution * Addition of inheritance gains * Deduction for costs of administration = pension capital on retirement expressed in relation to final earnings.

To obtain the replacement rate, this capital is divided by the annuity divisor.

In the OECD example: $45 * 0.1488 * 1.057 * 0.98 / 18.35 = 0.378$, or a replacement rate of 37.8 %.

The "return" (income indexation) in the inkomstpension scheme is identical with the development of the individual's earnings in the OECD's typical case of a so-called straight-line earnings profile. Therefore, the growth in income/indexation does not affect the replacement rate.

PP: Number of years * Annual contribution * Addition of inheritance gains * Deduction for costs of administration * Excess return / annuity divisor. As the growth in funded capital is assumed to be different from (higher than) the development of earnings, this difference must be considered in the calculation. We refer to this difference as the "excess return". The amount of this excess return, in number of years of final earnings, can be calculated at about 1.397 [= (1.015)^{22.5} * final annual earnings, where 22.5 is roughly the average number of years for which the contributions earn interest]. The inheritance gains are calculated as largely equal to costs of administration. In the OECD example: $45 * 0.02325 * 1 * 1.397 / 15.93 = 0.093$, or a replacement rate of 9.3 %.

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ITP1: Number of years * 4.5% * Excess return / annuity divisor. In the OECD example: $45 * 4.5\% * 1.015^{20} / 15.93 = 0.153$, or a replacement rate of 15.3%.

Total replacement rate by these simple rules of thumb: $37.8 + 9.3 + 15.3 = 62.4$

Appendix 2: The Commission's Typical Case for Sweden

The Commission's typical case for Sweden:

- A man born in 1982 and retiring in 2047 at age 65.
- He works for 40 years beginning at age 25.
- He is employed in the private sector as an "average worker" with initial annual pay of SEK 324 618 (approximately SEK 27 050/month) in 2006 prices.
- His earnings are assumed to increase in real terms by 1.8 percent per year.
- Inflation is 2 percent per year.
- His average annual return in real terms after contributions is 2.5.
- As he is employed in the private sector, he is assumed to receive an occupational pension according to the so-called ITP agreement. He draws his occupational pension for life.
- The 2006 rules for pensions and taxes apply.