Foundations of the Standard for Pension Projections

The aim of “Foundations of the Standard for Pension Projections” is to describe the context and rationale of the choice of alternatives and formulas found in the Standard. It is not to be viewed as a more detailed description of the Standard.

1.Why a Projection Standard?

The overriding aim of a standard for pension projections is to provide the insured with as uniform and excellent a result as possible, irrespective of where it is presented. A secondary aim is to produce projections that people can trust and understand, through the consistency of the underlying assumptions and a frank and open presentation.

Pension projections are used in two main contexts: partly they provide a picture of future expected pensions in forecasting tools of various kinds, partly they make it possible to simulate expected retirement outcomes under a variety of conditions. The pension projection is perhaps the most important line of communication between the pension provider and pension savers. For many people, a projection is the only thing that gives them a rational basis for decision making on matters affecting their future pension. Often, projections are made without forecasters making any assumptions of their own about conditions. If different projections then produce widely differing results, confidence is impaired and the projection cannot be used as a basis for decision-making.

Uniformity of calculation and presentation will help create clear communication about pensions and provide pension savers with a firm basis for decisions concerning their work and saving. A transparent presentation of a document describing how the calculations are made and what thinking lies behind the choice of calculation methods and assumptions, will enhance trust and confidence in the projections.

For younger people the projection is naturally uncertain, but a projection must provide a reasonably clear picture of the future pension if it is to function as a wake-up signal and basis for a decision on whether to take action. Such action might consist of changing one’s work situation – for example, going from part-time to full-time, or starting to save privately for retirement.

For older people close to retirement, the projection is primarily a basis for deciding when to retire, but it also enables them to see the effects of changing to part-time in order to gradually ease workload. The projection should thus be able to provide a more or less accurate indication of the size of their pension at different rates of withdrawal and at different times of withdrawal if these fall within the next few years. If the quality of the projection is deemed insufficiently high in these instances, the person concerned should be advised to turn to the pension company administering the pension in order to get a more accurate prediction.

Two guiding principles have driven the proposal for a Projection Standard: the projection must be easy to understand and to communicate, and it must be calculated as accurately as possible.

2. Scope

The Standard for Pension Projections covers national pension, occupational pensions (individual and collective) and private pensions. The Standard is designed for pension projections presented as "pre-calculated" to the recipient, that is, where no ‘own assumptions’ are made.

If a person requests that the projection cover a specific time period for pension withdrawal (starting time and/or duration), it should not in this connection be classed as an ‘own assumption’. One of the most common uses of a forecasting tool is in retirement planning, for example, by showing the size

of pension at different times of withdrawal. To serve as a basis for decisions of this kind, the pension must be calculated at the various points in time using the same criteria, that is to say, the Standard should be followed even when the time of pension withdrawal is changed.

The Standard relates to the information base and assumptions (in the Standard called factors) used from the present time until the date of retirement - and in some cases even beyond retirement. One goal of the Standard is to ensure the Pension Projection answers the question:

If I continue to work and save as I do today, what kind of pension will I get?

As a general rule, therefore, the projection calculation should be based on actual data about the current situation and on the assumption that this data will remain unchanged. When calculating the amount of pension in the projection, current statutory regulations and agreements pertaining to the insured should be used wherever possible.

The Standard contains both general factors over which the pension company has no control and are therefore independent of the individual product, and product-specific factors that are determined by each pension company and whose value depends on the individual product.

For the general factors found in the Standard, there is a single alternative. For product-specific factors, the Standard uses actual values for the particular product whenever available. If actual values cannot be used, the Standard provides a standard formula for product-specific factors. The presentation of the projection should clearly indicate whether it is based on actual values or standard formulas.

The Standard includes both defined-contribution and defined-benefit pensions. For defined-benefit pensions, the only relevant factors are Inflation, Economic Growth, Future Income/Premiums, Presentation.

3. Limitations

One of the most important functions of a forecasting tool is its ability to simulate a variety of hypothetical scenarios. It might, for example, be a question of changed income or investment options for pension capital. In such simulations, it must be possible to make one’s own assumptions to see what effects such a hypothetical future scenario would have on the pension outcome. The Projection Standard should not restrict such possibilities. On the contrary, the Standard may be used as a point of departure for different simulations.

In a simulation of various return assumptions, the information should be supplemented with risk information, highlighting the risk level for various selected investment alternatives. Such information requires more detailed explanation than is currently thought possible to provide for all the contexts the Standard Projection is intended to be used in.

It is also possible when presenting the Projection to inform about the uncertainty of other assumptions, for example, continued earning. However, it has not been judged possible to standardize the occurrence or structure of such information. Therefore, the Standard does not deal with the issue of whether, or how, any such risk information should be presented.

The size of amounts relating to guaranteed liabilities in traditional insurance is not covered by the Standard.

The Standard does not include how to coordinate the management of various defined-benefit pensions.

4. Factors which govern the projection calculation

The factors which the Standard covers and which will be discussed, detailed and justified in this appendix are as follows:

General factors: Standardized assumptions – all projections

- Inflation
- Economic growth
- Future income/premiums
- Capital yield during saving period
- Tax on investment return
- Presentation

Product-specific factors: Actual data is used – standard formulas if no data available

- Fees
- Survivor benefit and/or repayment cover
- Inheritance tax
- Life expectancy assumptions and projection interest rates

5. General factors

5.1 Inflation and Economic Growth

5.1.1 Inflation and Economic Growth in pension projections

In the context of pension projections, growth is generally synonymous with the development of the general wage level. Growth is used in pension projections mainly to calculate – on the basis of the last recorded income – the development of the individual's income annually over the projection period. This in turn affects the size of contributions, or pension rights, paid into income pension, premium pension and occupational pension. For defined-benefit pension plans, income growth affects the pension base used in the pension calculation.

Within the national pension scheme, growth is also used as interest rate in the income pension. This means that the pension balance (accumulated pension rights) is recalculated upwards each year by an interest rate equal to assumed growth. Growth, or the development of the general wage level, is measured in the national pension scheme by the income index, that is, the development of average pensionable income in Sweden (including income above the earnings ceiling).

In the projection calculation, a choice must be made between calculating the projection in real values or in nominal values (that is, assuming future inflation). This choice also influences the choice of growth and yield of funded capital, which must also be expressed in real or nominal terms.

5.1.2 Real calculation model

In a real calculation model, all calculations are made in fixed prices, that is to say, inflation is set to zero. The calculation may be made either without growth or with a given assumed positive growth.

If the real calculation is made without growth, that is, the projection uses zero percent growth, the projection amount is expressed in terms of the same price and wages levels as at the time of the projection. In this alternative, there is no income or standard increase during the time leading up to retirement. Zero growth over a longer period is highly improbable. The reason for using this alternative is simply to provide a projection amount expressed in current price and wage terms which can thus be directly related to current income.

If the real calculation is performed using positive growth, the projection amount will be expressed as an anticipated future income level at fixed prices. That is to say, the amount also includes the change in purchasing power resulting from growth. The problem for the individual is to understand what the amount really means. An annual real growth rate of 2 % over 30 years means an increase in standard of just over 80 %. The projection amount must therefore be compared with a salary which is also 80 % higher in real terms. A positive growth means that young people will receive projections indicating a pension which in fixed prices is as high as or higher than their current income.

Understanding may be facilitated by giving the level of compensation or an estimated final salary at the time of retirement. That makes it possible to see the relationship between income and pension, but it may still be difficult to grasp the real significance. Income level is assessed in relation to other people rather than as an absolute level. So even if the high amount in fact reflects a corresponding rise in standard, a comparison of the projection result with today's standard may well be misleading since the comparison should rather concern one's own and others' standard in 30 years. The demand for what is deemed to be an acceptable or normal standard increases continuously with growth. And since what will be "normal standard" in 30 years is not known, there is nothing to compare with.

The Swedish Pensions Agency has conducted a number of focus group tests in connection with the 'orange envelope'. The orange envelope projection reported earlier projection values in fixed prices at 0 and 2 percent of real growth. The tests clearly showed that most people find it difficult to relate to the concept of growth and to grasp what the projection value in the growth alternative actually represents. Moreover, assumed growth is often itself taken to be a projection of future growth, which leads to the realism of the projection result being called into question.

5.1.3 Nominal calculation model

In a nominal calculation model an assumption is made about a certain future inflation rate. Here growth is equated to either assumed inflation (no real growth) or to a higher figure (positive real growth). The reasoning on growth in the real calculation model is applicable here too. The difference is that the projection results are expressed not only in higher wages but also in higher prices, meaning that it can be even more difficult for the individual to understand what the amount actually represents.

5.1.4 Nominal calculation model with recalculation

An additional option is to use a nominal calculation model, but then convert the result of the calculation to the current price and wage levels by recalculation of the result by the change in the nominal growth assumption during the projection period.

5.1.5 Selection of calculation model

The main difference between the calculation models is that they express the projection result in different values: current prices and wages, future real wages, or future nominal wages. The point of departure for the Standard is that a model expressing the projection result in current price and wage levels is preferable because it is the one whose result is easiest to understand by the individual and it does not require any additional information in order to be interpreted in a reasonable manner.

There are, however, pension products where the calculation model has significance for the actual outcome of the projection. This is true of guarantee pension within the national pension, and non-indexed paid-up policies or price-indexed paid-up policies within occupational pensions.

The value of such paid-up policies will regularly be overestimated in a real calculation. Non-indexed paid-up benefits policies are estimated to number some hundred thousand (the figures are

uncertain). The average pension amount from paid-up benefits policies is not known but is thought to be low in many cases.

Another product is the price-indexed paid-up policy which will become overvalued relative to those benefits whose value depends on income growth. A third category of paid-up policies are those that are not guaranteed price indexing but historically have nevertheless generally been price-indexed.

Guarantee pension within the national pension is calculated according to a base level determined as a factor of the price base amount. In the case of positive growth, the base level will become relatively lower over time, the significance of guarantee pension will diminish, and over a longer period of time fewer and fewer people with income-based pension will receive anything extra at all from guarantee pension. As a result, the total pension amount will increase more slowly than the growth rate, meaning that the pension relative to final salary will be lower. This will be true if guarantee pension levels remain fixed over time, but another possible scenario is that guarantee pension levels are adjusted over time in order to provide a reasonable standard of living for the worst-off pensioners. If so, the projection gives too negative a picture of the future pension.

Without growth, guarantee pension retains its full value over the projection period, which may lead to an overestimation of the total pension for people with low incomes, since the norm is positive growth with successively decreasing relative value for guarantee pension. But as noted above, the projection size of guarantee pension without growth would still prove to be reasonably accurate if the benefit levels for guarantee pension were gradually changed by Parliament so that the size of guarantee pension relative to average income remained more or less constant.

The only model that addresses these special problems and also expresses the result in current prices and wages is the nominal calculation model with recalculation. The disadvantage of this model is that it entails assumptions about inflation and growth, which then become additional factors that have to be standardized. The model also involves more computational steps in the projection calculation itself, requiring greater capacity for the production of large volumes of projections for annual statements, etc.

For the Projection Standard, the real calculation model without growth has been chosen. The rationale for this choice is that the model is simple to understand and apply, it is already established and it gives most people a good picture of their pension, since it relates correctly to their current salary.

The nominal calculation model with recalculation will, however, be evaluated and may be used in a later version of the Projection Standard.

5.1.6 Balancing in the national pension

When the automatic balancing mechanism within the national pension is activated, it is unclear during periods whether and how fast the financial balance is recovering and if and when income indexation should again apply. The projection calculation must then decide whether only the balance ratio and balance index known at the time of the projection are to be used as the basis for the projection or whether a projection should also be made for a return to income indexation. If only known figures are used, the projection risks being too low in the case of projections where retirement starts after those years for which the balance ratio and balance index are known. On the other hand, this alternative means that a separate projection of economic growth must be made and be included in the projection.

In the projection factors for national pension included in the Standard, only known values of balance ratio and balance index are used. The rationale for this choice is partly that it accords with the principle that the current situation will continue until retirement, and partly that a projection of balance ratio development is very uncertain.

5.2 Future income/premiums

Future income is the factor that determines future contributions/premium payments to defined-contribution pensions, and it determines the pension base for defined-benefit pensions. Thus it also has a decisive influence on the result of the projection calculation. Since future income is unknown, an assumption must be made about the income from the time of the projection until retirement.

The assumption includes two elements: first it must determine what income to start from, and then how this income will develop up until retirement.

5.2.1 Startout income

There are basically two ways to determine the startout income. Either use the average income over recent years or use the latest known income.

The rationale for using an average income is to even out temporary changes in income so that a change in one particular year will not unduly impact assumed future income. This measure of income is appropriate if there is great variation in income each year relative to a fixed basic income.

On the other hand, the method is unsuitable if the income follows an annual upward trend, as in the case of a stable salaried income developing in line with general wage trends. In this case, an average of the income will consistently underestimate the income – by how much will depend on the number of years covered by the average. Generally, this will result in the projection underestimating the income of the majority of younger or middle-aged people, who generally have growing real incomes, while incomes will be overestimated for older people, who normally have diminishing real incomes.

A further drawback of using the average calculation is that a permanent change in income due, for example, to a raise, part-time work or change of job, will not have full effect until the end of the period of years the average covers.

The advantage of using the last known income as the basis for assumed future income is that for the majority of those in permanent employment it is a fairly stable and up-to-date value. Where income changes in a trendwise fashion, the value will gradually adjust itself to the growing or diminishing income. A further advantage is that permanent income changes will be reflected immediately in the projection. The downside to using the last known income is naturally the fact that temporary changes in income have a major impact on the projection.

At the communicative level, the last known income means the income is known to the individual and temporary deviations from normal income are likely to be known. The fact that changes in income, even temporary ones, have a major impact on the projection may also help people to better understand how the pension system works.

The concept of the last known income is not an unambiguous concept. In the context of national pension, it means pensionable income two years prior to the projection year, while for occupational pension pensionable salary can be both the previous year's income and an average monthly income throughout the year. Furthermore, the concept of income may vary between different products within one and the same collective agreement area. For example, for certain products it may be defined as basic salary without overtime, bonus or suchlike while for other products it may be actual wages paid.

In some pension schemes the reporting of income from employers is done on a monthly basis. In order to calculate pensionable salary in the annual statement, an average of monthly salaries reported over the year is used. To exclude salary that is not considered permanent for the insured, exceptional payments – such as in the case of illness or a bonus payout – are ignored.

The Projection Standard is predicated on the projection starting out from the last known income. If the actual pay structure is not known, the last known fixed monthly salary is used as a basis for calculating future income in the projection.

Note, however, that the above applies to the startout income for an assumption of future income. There are defined-benefit pensions where the actual pension calculation is done by calculating average salary for the final years prior to retirement. This is described in more detail in 6.5.

5.2.2 Income development

For the development of income up to retirement, there are four possible alternatives. The first alternative is to let the income follow general income growth up to the time of retirement, that is, the income develops annually in step with average wage developments and individuals keep their relative positions vis-à-vis income throughout the whole of life up to retirement. This alternative has the same objective as that stated for the Projection Standard, namely to answer the question: what will the pension be if the current situation continues up to retirement?

The second alternative is that a person's income grows by a certain annual percentage somewhat higher than general income development. This means the individual will have an income growth permanently above the average, resulting in an overestimation of the size of the pension in the projection for a large part of the population. Therefore this alternative ought not to be used.

The third alternative is to let each collective agreement area determine income growth, that is, have a typical growth for private white-collar workers, blue-collar workers, state employees, etc. One problem with such an alternative is that the dividing line between the various agreement areas is diffuse and has become increasingly less precise over the years. Another problem is that many people change their jobs and agreement area both once and many times throughout their lives, necessitating different methods of calculating income growth in the projection. There is also a large group that by definition cannot be sorted into a specific agreement area and would therefore not have typical income growth. This alternative would mean large sources of error in the projection calculation and would also create communicative problems, since it would be difficult for an individual to work out on what basis the projection had been calculated. Therefore, this alternative ought not to be used.

The fourth alternative is to let the income grow in step with the average income of cohorts. In practice, this would mean income growth would be above average during a person's younger years but later stagnate and remain below average from about the age of 55 up until retirement.

There are several reasons for lower average income growth in later years of working life: flatter salary growth, reduced working hours, increased sick leave, sick pay and the withdrawal of occupational or private pension. When these situations occur, the projection will change due to the actual change in income the new situation involves. This applies for example to sick pay or lower salary due to reduced working time or withdrawal of pension. If the projection based on cohort incomes takes into account "average" behaviour, the impact of such situations may be doubled – partly through the startout income for the projection being reduced by the actual event, partly through the average effect of all such events impacting income development up to retirement.

Using a diminishing income profile for a projection made in middle age or later, compared with a fixed income profile (assuming positive growth), means the projection value will be lower in absolute figures. The lower absolute projection value is due to the fact that with a diminishing income profile income growth is slower and thus results in a reduced lifetime income. However, if one looks at the compensation level, it means the projection value will be higher relative to final salary. The reason is that the value of already accrued pension rights increases in step with average earnings, that is to say, at a higher rate than the assumed future income growth of the individual. This alternative is also difficult to communicate because it is not easy for the individual to understand the basis on which the projection is calculated.

The Projection Standard has chosen the alternative of letting the salary follow general wage trends. With the Standard's twin assumptions of constant prices and zero growth, it means an unchanged salary until retirement. The rationale for this choice is that the result is easy for the recipient to interpret and that it follows the principle of answering the question what the pension will be if the current situation continues until retirement.

5.3 Capital yield during the saving period

The Projection Standard uses a general capital yield assumption, irrespective of which asset class the pension capital is invested in. One reason for this is that it enables pension projections to be presented without the need for supplementary information about various levels of expected yield and risk. Another reason is that an individual's pension capital may be, and often is, placed in different asset classes and that it also varies over time.

To achieve the common capital yield assumption requires on the one hand assumptions for each asset class and on the other assumptions of how pension capital is distributed among these asset classes. The basis for these assumptions is given in Appendix 1.

When assumed return on shares (6.5 percent) and interest rate (4.0 percent) and the capital allocation between them (about 75 per cent shares and 25 per cent interest) are combined, the result is an assumed nominal return of 5.9 percent. The Standard's inflation assumption derives from the Bank of Sweden's inflation target of 2 percent. That gives a common real rate of return of 3.9 percent.

In cases where a projection is given for a single product that is not included in the overall projection for the total pension, and the actual asset allocation of the individual is known, this can be applied to the basic assumptions concerning shares (6.5 percent) and interest (4 percent) and the yield thus estimated can be used in the projection.

5.3.1 The concept of excess return

A basic principle of the Projection Standard is that the projection result should be expressed as a value directly related to the salary that the individual has today. Therefore, the projection is calculated in fixed prices and with zero percent growth (wage development). This means that the projection salary will remain unchanged during the period up to retirement and that pensions not affected by investment income (income pension and defined benefit pensions) will also be expressed in terms of today's price and wage levels. To establish the correct relationship between pensions affected by investment income and those not affected, and between pensions affected by investment income and salary, those pensions affected by investment income may only be affected by the part of the return which exceeds wage growth.

Since it is proposed that the projection be calculated in an "artificial environment" with fixed prices and with zero percent growth (in the projection the same as wage growth), while the assumed rate

of return is expressed in a "real environment" with normal inflation and normal wage growth, the return assumption in the projection calculation must be expressed as "excess return", that is, it must be adjusted to an assumed normal wage growth in order for the projection amount to be correctly related to the current salary.

The assumed rate of inflation is naturally set at the Bank of Sweden's inflation target of 2 percent. The assumed growth rate has been set at 1.8 per cent in real terms. With adjustment for assumed inflation and growth, the return assumption in the projection will be 2.1 percent (5.9 – 2.0 – 1.8). The basis for the assumption of 1.8 percent growth is given in Appendix 2.

5.4 Tax on investment return

Current taxation, 15 percent of the government borrowing rate, is assumed to remain constant over the projection period. For an assumed government borrowing rate, there are two main alternatives. One is to use the most recent annual government borrowing rate. In this case, the Standard must be changed every year. For the projection, it would mean the result varied over the years depending on short-term changes in interest rates. Such an effect is not desirable and therefore the government borrowing rate is assumed in the Projection Standard to be the same as the assumption of long-term bond rate according to the capital yield assumption above, that is to say, 4 percent.

5.5 Presentation

Every year since 1999, the pension projection in the orange envelope has used the retirement ages of 61, 65 and 70. In 2006, other ages were introduced for those aged 60 or older. Depending on age, retirement ages thus range from 63 years and upwards. As of 2012, a so-called ‘own cohort’ retirement age is also given in the orange envelope. This means the age at which a birth cohort needs to retire in order to compensate for increased life expectancy.

The reasons for choosing the ages of 61, 65 and 70 are as follows: 61 is the earliest possible age at which old-age pension may be received. 65 was chosen because it was considered the "normal" retirement age, being the retirement age under the old system. 65 is also the age at which certain social insurance benefits, such as sickness and activity compensation and unemployment insurance come to an end and others such as guarantee pension and housing supplement for pensioners (BTP) start. 70 was chosen to provide a retirement age after 65 corresponding to the 61-year alternative. The reason for having several different retirement ages is to show how the retirement age impacts the size of monthly pension payments. One is reminded that it pays to work longer, and that remaining life expectancy at retirement greatly influences the size of pension.

For those over 60 and closer to retirement, the selected retirement ages lie closer in time and frequency in order to provide this group with projection alternatives likely to be more relevant for an impending decision on retirement.

In occupational pension agreements, the normal retirement age is 65. Even here, it is possible to claim a pension both earlier and later, but generally no further pension benefit is earned after the age of 65.

One problem with using 65 as the retirement age in the projection is that it perpetuates the perception that there is a normal retirement age, which is 65. This has also been demonstrated very clearly in the focus group tests that have been conducted. Another problem is that the level of compensation at age 65 is destined gradually to decrease. This is a fact, but it tends to suggest the need for private savings to maintain income standards unchanged at the set retirement age rather than the need to postpone retirement. Gradually shifting the date of retirement in the projection

would increase knowledge of how the pension system works as well as emphasize the need to postpone retirement in order to receive a pension of sufficient size.

Given the different conditions found within national pension, the various occupational pension agreements, and private pensions, it is justifiable to use different retirement ages in the projection. Virtually all occupational pension schemes offer the opportunity of premature or postponed retirement with more or less actuarially calculated deductions from or supplements to the pension relative to the "normal age" of 65. In most occupational pension schemes, however, no further pension points are earned after 65. If no set retirement date is specified in the projection conditions, it is thus reasonable in the projection to use the retirement age named in the agreement. In the absence of a fixed retirement age, the retirement age of 65 should be used. If the person for whom the projection is made is 65 or older, the retirement date may be set to the following month or the next whole year.

A projection result may be presented either as a percentage of final salary or as a fixed sum in SEK. A percentage of final salary may be thought to be the more accurate way of reporting the result, since the relationship pension/salary may be relatively stable over the years while a fixed sum in SEK is normally always wrong unless the projection is made immediately prior to retirement. However, many people find a percentage difficult to make sense of, while those who might possibly prefer a percentage can usually also understand the meaning of a fixed sum in SEK and apply it to the pension/salary relationship. The projection result should therefore be presented as a fixed sum in SEK.

As a projection by definition involves a degree of uncertainty relative to actual future outcomes, the projection result should not be not presented as a precise unrounded figure in SEK, since that would give the impression of certainty. The projection result should be rounded to the nearest 100 SEK. Whether to round the total amount, or the national pension, occupational pension and private pension separately, is up to the projection provider to decide. In some cases, such as when individual policies are reported, it may also be appropriate to leave the result unrounded.

Certain information should be included with the projection. It must be stated whether pension amounts are payable for life or for a limited period only, and if and how the amounts vary for the different periods.

The recipient should be reminded that it is only a projection and that the actual figures may well turn out to be different. People close to retirement who receive projections for insurance schemes other than their own should be advised to contact the pension administrator of their own insurance scheme in order to get more exact details of their pension.

It should also be possible – for example, via a clickable link – to get more details about the projection calculation such as "This is how we have calculated your pension." Under this heading, values should be given for relevant factors underlying the projection. It should also be stated whether the projection calculation follows the Standard, and whether the projection is based on actual values or standard formulas.

6. Product-specific factors

With regard to product-specific factors, the Standard uses actual data whenever it is available and when it is not available the Standard’s default formulas are to be used.

In practice, situations may arise where it is not totally self-evident whether to use actual data or default formulas even when actual data is available. An individual may be covered by various

insurance policies which provide only fragmentary information about the actual details of product-specific factors. It may then be reasonable, for both practical and communicative reasons, to use the Standard's default formulas throughout.

The Standard's default formulas for product-specific factors are based on the following:

For national pension, the projection uses the prognostic factors produced annually by the Swedish Pensions Agency. The national pension is governed by statute and has strict, general rules that determine how these factors are to be calculated, and the factors are the same for all individuals. Therefore, prognostic factors can be regarded as actual data for forecasting purposes and it is also reasonable to use these prognostic factors in the Standard. The prognostic factors are available at the Swedish Pensions Agency website and are updated annually in September (index) and November (other factors).

For collective occupational pensions, the majority of holders make no active choice but default to the so-called non-choice solutions. The starting point for the standard formulas is therefore the value of the factors in these non-choice solutions. There are a wide variety of occupational pension agreements with partly different solutions, but most collective agreements follow the example of the four major collective agreement areas, the ITP (white-collar), the SAF-LO (blue-collar), KAP-KL (county council and municipal) and PA03 (central government). Therefore, in order to create a viable standard, these four agreement areas have been selected as the basis for the standard formula. In practice, this means that private white-collar workers, private blue-collar workers, municipal or county municipal employees, and state employees are referred to their respective agreements.

For individual occupational and private pensions, the default formula is based on estimated median values of existing products in the market.

6.1 Fees

The level of fees has a significant impact on the outcome of defined-contribution pension savings and the issue of the significance of fees has received increased focus in recent years. It is therefore essential to include in the projection calculation a reasonable estimate of the size of fees in cases where no information on actual fees exists.

Within the national pension, fees are charged for both income pension and premium pension. The fee rate used in the projection calculation stems from the projection value rules determined each year by the Swedish Pensions Agency. For income pension, an administrative fee is charged that is currently about 0.04 percent of the pension balance. For premium pension, there is partly an administrative fee charged by the Swedish Pensions Agency, and partly an asset management fee charged by each chosen fund. The administrative fee is currently about 0.1 percent and stems from the Swedish Pensions Agency projection value rules. The asset management fee varies widely between different funds, but the Swedish Pensions Agency discount system levels out actual fee charges. Due to the practical problem of dealing with about 800 different funds and the levelling effect of the discount system, a standard value is always used for the asset management fee in the premium pension system. The average charge after discount is to be used as the standard fee in the Projection Standard. This fee is currently about 0.3 percent, so the total fee for premium pension is set at 0.4 percent.

For defined-contribution collective occupational pensions, an administrative fee is charged by each selection centre (for KAP-KL and PA03 no selection fee is charged) and then an asset management fee (or administrative and asset management fee) is charged by the selected alternative. Because the majority of those with a collective occupational pension do not make an active choice but end up in

the non-choice option, it is reasonable to use as a default for collective occupational pensions the fees charged partly by the selection center and partly by the administrator of the non-choice option.

For the collective agreements of PA03, KAP-KL and SAF-LO, fees vary depending on when exactly the premium is paid. The fees have the greatest significance for younger people with many years left before retirement, while having only a marginal effect on the pensions of people close to retirement. It is therefore reasonable to use the currently charged fees as the default in the Projection Standard. For PA03 and KAP-KL this means the fees applying as of 2012, and for SAF-LO the fees applying as of 2009.

Individual occupational and private pensions generally have significantly higher fees than collective occupational pensions. There is a large spread between fees but an average of the various fees should be used as the standard fee. The Projection Standard's standard fee is based on an average of the fees published on the Swedish Consumer Agency's website and is as follows:

Insurance	**Fixed charge, SEK**	**Percent of capital**
Trad	100	0.7
Fund	250	1.5
Unknown	150	1.0

6.2 Survivor benefit and/or repayment cover

In several occupational pension products, it is possible to select survivor benefit. Survivor benefit usually offers a choice of payout of one or more base amounts over a selectable number of years. Survivor benefit may also be a preset option that can be opted out of. In such cases, it is usually a question of repayment cover, meaning saved capital is paid out.

For survivor benefit a fee is generally charged leading to a reduction in the contribution to retirement pension. The fee for survivor benefit varies with the option selected and usually also with the age of the insured. For people in their 50s and upwards, the fees for survivor benefit can be considerable. No fee is normally charged for repayment cover, but on the other hand in such cases the insured will receive no inheritance gains.

In order to make a correct projection calculation for retirement, the status regarding survivor benefit must be known so that premiums for old age pension or inheritance gains are calculated correctly. It is also essential to know what premiums are charged by each company for various survivor benefit options and for different age groups.

A problem associated with survivor benefit is that in the projection situation is not known how long the insured person intends to continue with survivor benefit. For most people, it would be rational to cancel survivor benefit once they start getting on in years, partly because the family situation usually changes once children move out and partly because survivor benefit in most cases becomes very expensive for older age groups. In reality, however, many people do not think about this but continue paying for survivor benefit even when there are better solutions. This is probably especially true of those products which include repayment cover in the preset solution and require it to be actively deselected.

The question is thus what to assume in the projection. Will survivor benefit continue until retirement or be discontinued at an assumed age? Allowing survivor benefit to remain may produce too low a pension projection (if the insured should deselect survivor benefit later on) because the premiums for survivor benefit eat up a large portion of the funds reserved for old age pension. On the other hand, it is inappropriate in a projection to assume a type of behavior on the part of the insured that

they themselves may be unaware of. And the projection might end up showing an excessively high amount (if the insured allows survivor benefit to continue), which would be an even worse situation. Therefore, it is recommended that the projection assume that the situation existing at the time of the projection will continue in the future. Meanwhile, people should be alerted to the effects of survivor benefit on old age pensions, at least after reaching a certain age.

If the actual situation regarding survivor benefit is unknown, the following default formulas are used in the Projection Standard:

National pension

No survivor benefit/repayment cover.

In Premium pension, one may select survivor benefit during the pension pay-out period. At present this option is not included in the Projection.

Collective occupational pension

The Projection uses the alternative included in the non-selection option for each agreement area.

This default has been chosen because the majority of those with collective occupational pensions are included in the non-selection option.

Individual occupational pension and private pension

The Projection is calculated on the assumption that there is repayment cover.

This default has been chosen because the majority of individual occupational pensions and private pensions have repayment cover.

6.3 Inheritance gains

Inheritance gains are calculated according to a standard formula based on the so-called 'Pension Insurance Safeguards' (tryggandegrunderna). The mortality rate given in the 'Pension Insurance Safeguards' for the generations of the 1940s, 50s, 60s, 70s and 80s is used separately and with an average for men and women. Any repayment cover is taken into account.

Inheritance gains during the pension payout period are included in the divisors used in the Pension Calculation.

The table below is based on the 'Pension Insurance Safeguards', stipulated by statute FFFS 2007:24 of the Financial Supervisory Authority (FI).

The statute stipulates how mortality is to be calculated using a Makeham function:

$$\mu_x = \begin{cases} a + b \cdot e^{cx} & \text{för } x \le w \\ \mu_w + k \cdot (x - w) & \text{för } x > w \end{cases}$$

where w = 97 and k = 0.003 and where a, b and c depend on year of birth and gender.

The parameters a, b and c in the mortality function are given in the following table.

The table also indicates the percentage of the capital to be distributed as inheritance gains this year. It corresponds to the one-year mortality risk in 2011 for a person born in the middle of each decade.

Average of men & women	a * 10^3	b * 10^6	c	Inheritance gain
1940s	1.6	2.112	0.124	0.92%
1950s	1.3	1.019	0.130	0.28%
1960s	1.2	0.434	0.139	0.15%
1970s	1.1	0.138	0.151	0.11%
1980s	1.0	0.075	0.159	0.10%

Mortality for persons born during the 1980s is also used for those born later.

6.4 Life expectancy assumptions and projection interest rates

There is a wide spread of values in life-expectancy assumptions and projection interest rates between different insurance schemes, reflecting more than simply a different view on actual life expectancy or future returns. Life-expectancy assumptions and projection interest rates are also used to ensure a desired payment profile during retirement. The shorter the assumed life span and the higher the assumed projection interest rate, the higher the first pension payout. The pension administrator may here choose a value for these factors depending on whether a front-heavy or tail-heavy payout profile is desired. Different values may also reflect different views on how conservative the assumptions need to be.

As far as is known, the Swedish Pensions Agency is the only pension administrator to develop separate assumptions specifically for forecasting operations.

The Swedish Pensions Agency's projection assumptions concerning life expectancy are based on Statistics Sweden's projections of future mortality, which means projections for younger generations are based on the longer lifespans these are expected to have. For occupational and private pensions, if the various insurance schemes' actual values are used, the projection calculation will reflect the situation for the generation retiring in the next few years. Conversely, the calculation will underestimate life expectancy – that is, produce projection values that are too high – for the younger generations.

Therefore, as a basis for the Standard's default formula, the generational mortality of the 'Pension Insurance Safeguards' has been chosen in order to provide a better expected value for future life-spans. It may also be noted that there are ongoing programs in certain companies aimed at using generation-adjusted mortality for future projections.

National pension

Projection divisors set by the Swedish Pensions Agency are used.

The projection divisors are different for income pension and premium pension. The projection divisors are based on actual divisors for national pension, but take into account Statistics Sweden's mortality projections. New projection divisors are determined each year in November.

Collective occupational pension

Since the majority of those with collective occupational pensions do not make a choice but accept the non-choice alternative, this group has been chosen as the basis for the standard formula. It has not been possible to obtain free access to the mortality assumptions and projection interest rates applying to non-choice alternatives for each of the four collective agreement areas. Since a standard must be freely available to anyone wishing to use it, the standard formula has instead been based on data in the public domain that is freely accessible.

As the standard formula for mortality, the mortality rates from the 'Pension Insurance Safeguards' have been used, where the generations of the 1940s, 50s, 60s, 70s and 80s are used separately and with an average for men and women. Any repayment cover is taken into account. Projection interest rate is based on the projection interest rates of non-choice alternatives, as published on the Consumer Insurance Agency's website. Declared gross interest rate is reduced by the fee amounts quoted on the same website for respective non-choice alternatives as well as by a dividend tax of 0.6 percent.

Individual occupational pensions and private pensions

In the case of individual occupational pensions and private pensions, the product offering is very extensive. It is thus impossible to have a standard formula adapted to the different products, since the standard formula must of necessity be simple and present a reasonable mean value of existing products. In addition, the sources of the standard formula must be freely available.

As the standard formula for mortality, mortality rates of the 'Pension Insurance Safeguards' have been used, where the generations of the 1940s, 50s, 60s, 70s and 80s are used separately and with an average for men and women.

Any repayment cover is taken into account.

As the projection interest rate, an average of projection interest rates for the non-choice alternatives is used, estimated at 2 percent after taxes and fees.

6.5 Calculating defined-benefit pensions

In calculating the pension amount, the actual rules applying to the various pension products are to be used in concert with the values produced by the other assumptions. This means, for example, that in calculating defined-benefit national and municipal pensions, the pension base is calculated as an average of the last five years – or five of the last seven years – prior to retirement. If a projection is made within five or seven years of the start of retirement, it will thus be based on a combination of actual historical earnings and assumed future earnings.

For traditional life insurance policies with guaranteed amounts, the projection amount should be based on an amount calculated with dividend. If dividend is taken back, this will appear in the projection at the time it is taken back.

The calculation of defined benefit pensions is normally rule-driven if payment is made under the pension agreement's preset options. When payment of a defined benefit pension is to be made from a different date and/or for a different duration than under the pension agreement's preset options, a product's actual conversion factors are chiefly used, which are either rule-driven or based on the pension administrator's actuarial assumptions. If these product-specific conversion factors cannot be accessed, standard conversion factors are used instead, based on the mortality rate of the 'Pension Insurance Safeguards' and the non-choice alternative's projection interest rate under Section 6.4.

Appendix 1 to Foundations of the Standard for Pension Projections

1. Points of departure for yield assumptions

There are several compelling arguments as to why shares may be expected to give a higher yield than investment in bonds over the long term. Shares are riskier and investors therefore demand a higher expected yield when they invest in shares compared with bonds. Shares are riskier than bonds because shareholders are only entitled to their share of a company's assets once the claims of the company's bondholders have been met. The risk premium for shares is usually expressed as a premium in relation to risk-free interest usually represented by interest on government debt instruments with short maturities. It is clear from the above arguments why the expected yield on equity investment in a specific company should be higher than expected yield on investment in corporate bonds issued by the same company. Corporate bonds for their part should normally be priced to give a higher yield than corresponding government bonds since investors in corporate bonds are exposed to the risk of bankruptcy. Government bonds should in turn provide an interest rate risk premium relative to Treasury bills because the higher interest rate risk means the value of long-term bonds will fluctuate more than the value of Treasury bills. The above discussion reveals why it is reasonable to expect shares in the long term to give a higher yield than what may be expected from investment in less risky instruments.

As a point of departure for the long-term yield assumptions for different types of asset classes, use has been made of the long-term equilibrium interest rate which as of 2012-01-01 is to be used for discounting long insurance liabilities according to the so-called Solvency II Directive. In addition, estimates of risk premiums for various asset classes based on the Credit Suisse Global Investment Returns Yearbook 2010 have been used. This publication is an update of the results presented in the book "Triumph of the Optimists" (Princeton University Press, 2002). The book is written by Elroy Dimson, Paul Marsh and Mike Staunton and is based on historical data going back 100 years in time.

1.1 Long-term equilibrium interest rate

Solvency II is the new solvency directive requiring insurers to have sufficient financial resources to manage the risks found in the company balance sheet. Because many insurance companies, especially life insurance companies, have very long-term liabilities, a significant component of the regulations is how long-term insurance liabilities are to be evaluated and discounted. For most interest rate markets there are liquid interest rate notations to be had up to 10-30 years ahead. For longer durations, however, relevant market data to use as a basis for discounting is often lacking. An important component of the regulatory system now being introduced is therefore the assumption of a long-term equilibrium interest rate that will serve as the basis for discounting long-term insurance liabilities. This long-term equilibrium interest rate has been fixed at 4.2 percent.

The assumptions used in pension projections should be based on very long-term assumptions and should not be changed too frequently. There are several additional advantages when the assumptions underlying a life insurance company's financial reporting are clearly linked to the pension projections that the company's customers receive. Against this background, the long-term equilibrium interest rate used in connection with Solvency II would also seem to be a reasonable point of departure in projectioning. It should be emphasized that the long-term equilibrium interest rate has been set with a view to being a "best estimate" and thus includes no expressed or implicit safety margins.

The long-term equilibrium interest rate of Solvency II may be said to represent yield from investment in bonds with longer maturities than those available in the financial market. It is therefore reasonable to assume a somewhat higher term premium compared with a long bond portfolio. The expected return from investment in a portfolio of long-term bonds may therefore over time be expected to amount to approximately 4%.

1.2 Term premium

The normal yield curve slopes upward, which is usually explained by the fact that investors in bonds with longer maturities demand compensation for the increased interest rate risk these entail. Yield difference between a short money market investment and long bonds varies over time and across markets. Elroy Dimson, Paul Marsh and Mike Staunton have analyzed the size of this duration premium based on historical data and note that the yield difference between a short-term investment equivalent to a short-term treasury bill and the interest on long-term bonds may be expected to amount to about 1 percentage point

1.3 Risk premium of shares

The historically realized global equity risk premium relative to short-term interest rate instruments amounts to approximately 4.4%. This premium has varied considerably between different periods. There are several reasons why the future equity premium is likely to be lower than that historically realized. There are both quantitative and qualitative arguments as to why the expected future risk premium in global equities is likely to be lower than that historically realized. Common arguments for why the historically realized risk premium is higher than what might reasonably be expected in the future are: unexpectedly high economic growth, dividend growth, the effects of trade liberalization.

The fact that future expectations of excess yield on equities relative to short-term interest-bearing investments have fallen in the last decade is one more reason why the historically measured risk premium can be expected to be lower than the future expectation. The fact that reduced future expectations lead to a short-term increase in the realized return/risk premium can, slightly simplified, be compared to what happens with a long fixed income investment when interest rates fall. The future expected returns fall while lower discount rates lead to a positive price effect in the short term. There are also several other technically oriented arguments as to why the historically realized risk premium is higher than what can be expected in the future.

Elroy Dimson, Paul Marsh and Mike Staunton argue that it is reasonable to expect a long-term risk premium in global equities in the range of 3-3.5% above a short-term interest-bearing investment.

1.4 Swedish shares

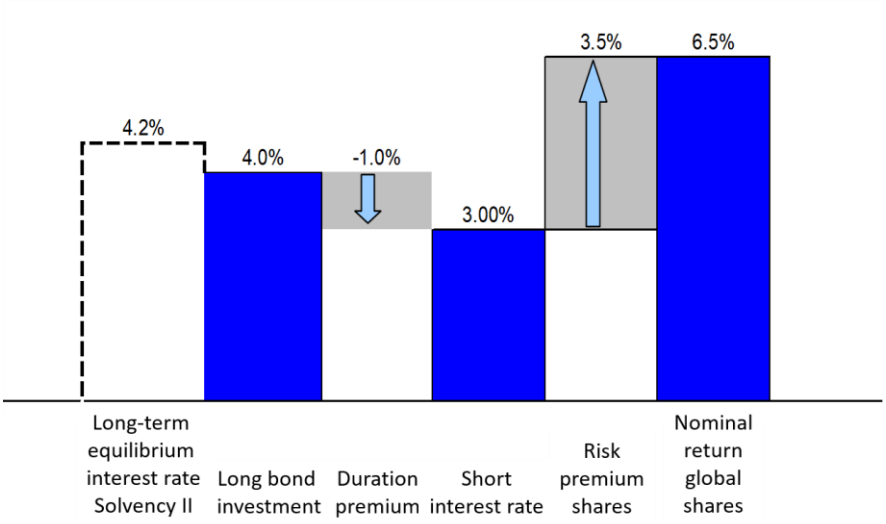
Given the relatively large proportion of Swedish shares in Swedish pension savers' asset portfolios one might consider making separate estimates of the expected risk premium for this asset class. Swedish equities in recent years have had a return significantly higher than what global equity investment has generated. However, it is not reasonable to expect that in the long term compensation per risk unit would be higher for a Swedish stock investment than a corresponding global investment. As an argument for why the expected return should be higher on a Swedish stock investment it is sometimes claimed that the Swedish stock market has a higher market sensitivity measured as beta. However, there is little basis for making other return assumptions for Swedish equities than for global equities. The long-term realized equity risk premium for Swedish shares is 4.2% compared to 4.4% for global equities.

1.5 Other assets

The return on other assets, such as so-called alternative investments and real estate investments, are assumed to be distributed equally between long interest rate and equities. The reason is that the existence of other assets primarily affects the relationship between risk and expected return. It is possible to treat them in this simplified way since the assumption is not intended to show risk-adjusted returns.

1.6 Summary of yield assumptions for asset classes

The structure of the long-term rate-of-return assumptions is illustrated schematically below. The figure summarizes the nominal rate of return assumptions proposed for each class of asset (before fees).



1.7 Asset distribution of pension capital

The assumptions for capital allocation, distribution between premium pension and occupational pension, and fees, as listed below, are based on the new products available within occupational pensions today, despite the fact that the greater part of the capital today is not invested according to them. This is because we have wished to focus on how incoming premiums are placed, since these will determine how pension funds are invested in the future. Generally, this means a higher proportion of shares and a lower fee level compared with how the total capital is invested today. All assumptions for occupational pensions are based on collective agreements for occupational pensions since they constitute the vast majority of occupational pension funds.

Assumed distribution fund insurance TJP	30 %
Assumed distribution traditional insurance TJP	70 %
Assumed capital allocation occupational pension shares	70 %
Assumed capital allocation occupational pension interest	30 %
Assumed capital allocation premium pension shares	90 %
Assumed capital allocation premium pension interest	10 %
Assumed distribution occupational pension	70 %
Assumed distribution premium pension	30 %

By weighting together the above assumptions, we obtain a total capital allocation of approximately 75 percent shares and 25 percent interest rate.

Appendix 2 to Foundations of the Standard for Pension Projections

Assumption about the future development of the income index

The income index plays a crucial role in the income pension system. The percentual changes in the income index are used every year to write up the accrued pension capital of pension savers. The same percentual changes are used (after deduction of the so-called norm of 1.6 percent) to write up the income pension for those who are pensioners.

The income index is intended to reflect the annual average income growth for those who are economically active or at least are in the so-called economically active age. Salaries make up the bulk of this income, but in addition there are income-related social security benefits from sickness and parental insurance, etc., and unemployment benefits. The income-related part of sickness and activity compensation (early retirement) is also included.

Wage developments thus greatly impact the development of the income index. A simple approach common when making long-term assessments is to start with an assumption of productivity growth in the economy (the volume of production per hour worked) and then link real hourly wages to this – most often the same growth rate being assumed. The thought behind the latter assumption is that the profit margin per product unit is constant in the long term.

Long-term productivity trends

Assumptions about long-term productivity trends are usually based on studies of history and on hypotheses concerning what might exert an influence in the future. In Figure 1, changes in productivity are measured as percentual changes in real GDP per hour worked in the economy annually since 1960. It is difficult on the basis of the year-to-year data to determine exactly what the long-term growth in productivity really is and where it is heading. The annual variations are considerable. The diagram attempts to capture the trend by showing for each year an average for 10 years back in time – a 10-year moving average rate - together with the change rates for the individual years.

There was a decisive long-term slowdown in productivity growth rate during the period from the late 1960s to the early 1980s. Sweden shared this experience with other industrialized countries in Western Europe as did USA and Japan – even though the slowdown in Sweden was among the most pronounced.

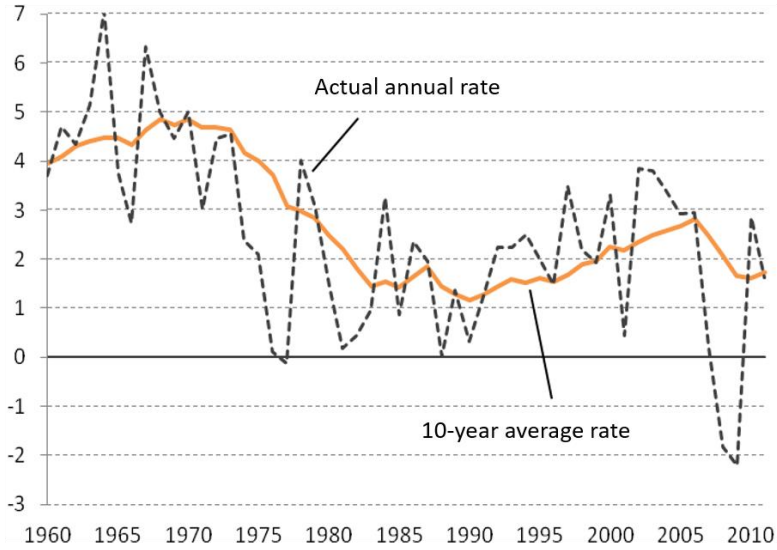
The postwar period up to the early 1970s had been characterized internationally by strong productivity growth. An important factor initially was the technological gap that existed after World War II between the United States and other industrialized countries. Imported technology from the United States made it possible to rapidly improve productivity in Western Europe and elsewhere. We still had labour reserves available in the agricultural sector, and productivity in the economy as a whole was reinforced by transfer gains made when resources were shifted to the notably more productive industrial sector.

In Sweden, productivity growth was 4 percent annually during the 1950s, almost 5 percent annually during the 1960s, and 2.8 percent annually on average as late as the 1970s. Growth received a further boost from the liberalization of world trade that took place. Tariffs began to be dismantled as a result of global negotiations and in Western Europe through the formation around 1960 of the EEC (predecessor of the EU) and EFTA. Later, a free trade agreement was signed between the two blocks.

International specialization and division of labour increased, and, not least in Sweden, there was productivity-enhancing structural change.

Diagram 1. Productivity growth in the Swedish economy measured as GDP per hour worked

Percent



Until the early 1970s, the international capital market was strictly regulated within the framework of the so-called Bretton Woods system. Exchange rates were fixed and could only be changed spasmodically through devaluations and revaluations. Larger deficits in a country's balance of payments could only be financed with the assistance of the International Monetary Fund. The dominant reserve currency was the U.S. dollar. When the United States economy started to have balance of payments problems - partly as a result of the war in Vietnam - the Bretton Woods system broke down in 1971. A period of floating exchange rates began, and the dollar fell sharply. At the same time international inflation accelerated. Inflation peaked with the oil-producing OPEC countries' oil price shock 1973-1974. This was epoch-making for the global economy, with far lower productivity growth and overall economic growth than before. The time of rapid structural change was largely over. Some of the older industrialized countries reverted to a policy of special sector subsidies and trade barriers to protect domestic production and employment. It is also possible that the great potential for productivity growth that had existed in industrial production was already been largely exhausted, irrespective of the financial problems suffered by the world economy.

Productivity growth increased again in the 1990s, and this trend continued until 2006. For the ten-year period 1996-2006, growth in Sweden's GDP per hour amounted to 2.9 percent annually, admittedly well below that of the 1950s and 1960s. The renewed growth was interpreted by many - both internationally and in Sweden - as evidence that a new change in the prospects for growth had occurred: the era of the 'new economy'. The concept of the 'new economy' was associated primarily with the great advances in computing and information technology, but also with the increasingly globalized financial markets, deregulation of a number of service sectors, new flexible forms of work organization, etc. The sharp fall on stock markets for Swedish and global IT companies in the early 2000s did not constitute grounds for seriously doubting the new technology. The important thing was that the technology itself was still there, even though the question of what enhanced growth prospects it might fuel in the long term remained unanswered. Computers and IT technology have

existed and evolved over several decades, and many important breakthroughs saw the light of day long before the 1990s.

It can be argued – and has been, not least in the U.S. - that the new economy mainly favoured productivity in the IT companies themselves, and that it left no deep traces in the remaining (naturally much larger) traditional economy. During the period 1995-2000, Swedish productivity growth was 2.5 percent per year, but only 1.5 percent excluding the IT and telecommunications industries. It is unlikely that IT productivity growth long term will be able to continue as in the 1990s, with a 40-percent annual increase in volume. Unless significant spillovers to the more traditional market segments occur, there is a great risk that the economy's overall productivity will start to drop again.

It is difficult to gauge what - if any - long-term consequences will result from the 2008 global financial crisis and its successors in primarily Europe 2011-2012. What is clear is that Swedish productivity growth during these years has ridden the roller coaster in a spectacular manner. For the first time in the postwar period significantly negative numbers were recorded in 2008 and 2009. However, this was caused by a form of behavior on the part of employers that might be labelled "new modern". Prior to the serious crisis of the 1990s, recessions were not usually allowed to result in job losses but in reduced productivity and lower profits. Retaining the workforce ("labour hoarding") was seen as an investment for a future boom. The crisis of the 1990s resulted instead in layoffs and unemployment. This allowed productivity growth to be maintained. It was primarily the least profitable employees and the least productive workplaces that were axed. Average productivity in remaining activities rose accordingly. It had the effect of a kind of reconstruction not unlike developments in the 1960s, with the difference that the workers laid-off had no new activities to go to but became unemployed. Employers could tighten efficiency and loyalty requirements on the remaining staff as a result of the weak state of the labour market.

In connection with the financial crisis of 2008, the older form of employer behavior seemed to have come into favour again: the labour market situation deteriorated less than expected but there was a marked short-term effect on productivity growth.

Assuming that the global economic turmoil of recent years does not lead to far-reaching changes in how the global economy functions – which is not altogether unthinkable and might hamper development – it may be reasonable to expect future productivity growth in Sweden to reach the same level as in the period 1970-2011, that is, 1.9 percent annually, measured as GDP growth per hour worked. In the context of this assumption, the "boom years" of the 1950s and 1960s appear exceptional, occasioned by the global reconstruction after World War II, the return to global free trade, etc.

Real hourly wages

Real productivity growth in the economy cannot easily be translated into an assumption of real hourly wages development. In particular, two factors are important: profit margins and the payment of social security contributions.

Figure 2 shows the 10-year average (the same type as in Figure 1) for both productivity (GDP per hour worked), and real hourly wages in the economy. It is striking that real hourly wage increases were significantly lower over a long period stretching from the early 1970s to about 2000.

Diagram 2. Productivity growth in the Swedish economy and real hourly wages growth 1950–2011

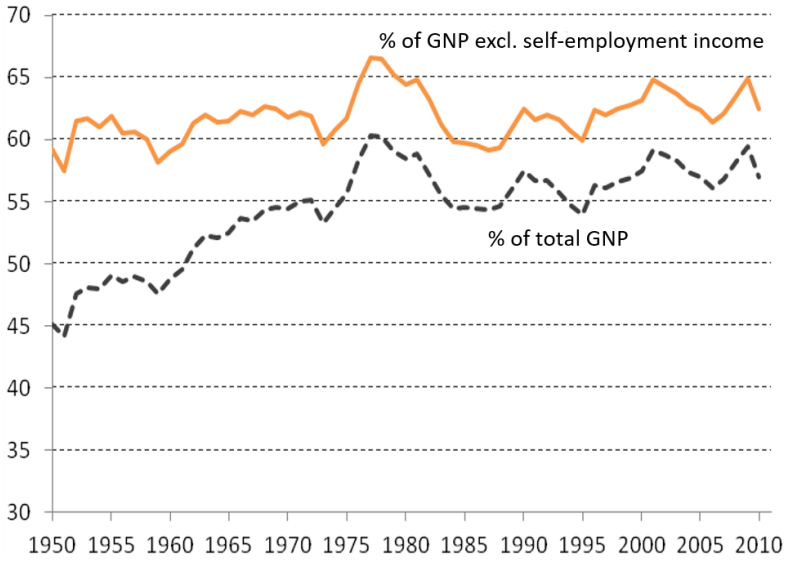
Historical 10-year average, percent per year

Wages account for only a little over half of GDP. In addition to wages, GDP consists of profits and payroll taxes. Since the second half of the 1970s, profits (gross, before deductions) have made up between 40 and 45 percent of GDP, but without any long-term trend up or down. From 1950 until 1977, however, there was a substantial decline in the profit share, from 55 to 40 percent. Meanwhile wages (including contributions) rose from 45 to 60 percent. The main reason for this development was the decline in agriculture, which meant that a large part of the society's revenues was reallocated from self-employment income to wage income. Any other fluctuations in the share of profits and wage costs were mainly due to market fluctuations. Cyclical variations in wages are not as strong as in profits.

See diagram 3.

Diagram 3. The wage sum (including employer contributions) as a percentage of GDP from 1950 to 2011

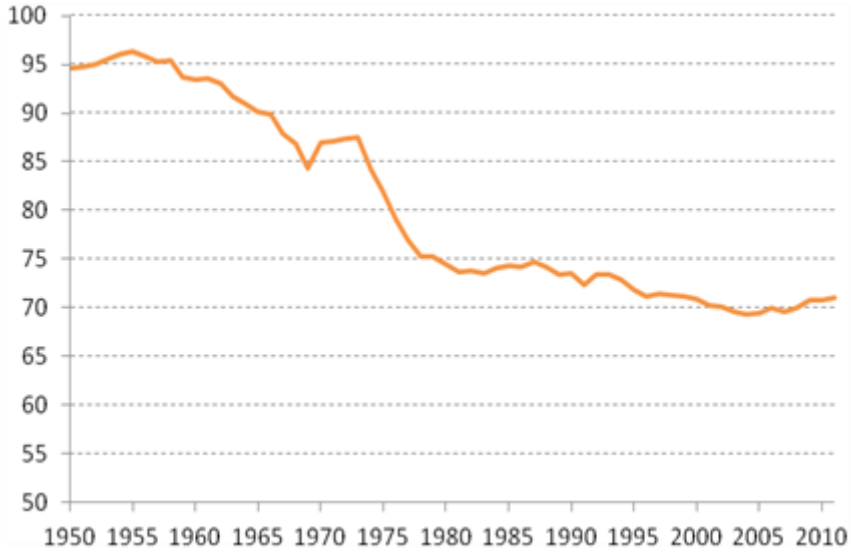
Percent



The salaries included in the income index are only actual salaries, that is, employer contributions are excluded. An important reason why (actual) real hourly wages according to diagram 2 have risen more slowly than productivity is the series of increases in employer contributions made up to the end of the 1970s. Actual wages are now only about 70 percent of employers' total labour costs compared with almost 100 per cent in the 1950s. See diagram 4. Employer contributions are paid ultimately by the employees themselves. Otherwise, the increases would have had a negative impact on growth in profits, which, as Figure 3 shows, was not the case.

Diagram 4. Actual wages as a percentage of the wage sum (incl. employer contributions) from 1950 to 2011

Percent



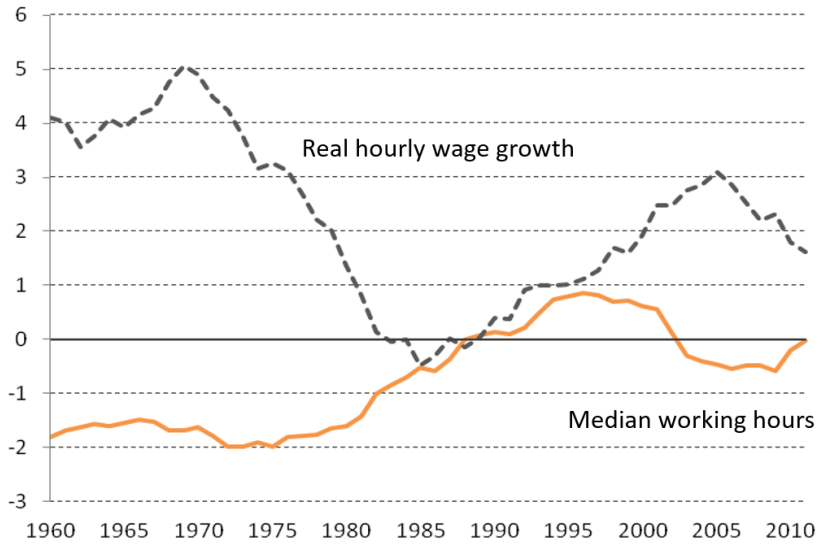
Providing that the profit share of GDP remains constant in the long term, as seems likely according to diagram 3, and social contributions remain constant - which is a political assumption - real growth in hourly wages will match productivity growth, that is, they will be 1.9 percent per year.

The real annual wages

It is not hourly earnings that are included in the income index but wages per employee per year. Wages per employee must therefore be calculated as the hourly wage multiplied by the average hours worked for the year. Average hours worked have developed over the long term as shown in Figure 5.

Figure 5. Average hours worked and real hourly wage trends 1950-2011

Historical 10-year average, percent per year



Average hours worked declined in the period 1950-1980 by almost 2 percent per year on average. This was a way of taking out the potential wealth increment in the form of increased leisure at a time when real hourly wages rose sharply. Even after this reduction in working hours, three-quarters of the growth in income potential remained for real enhancement of annual incomes. It should be noted that the decline in average hours worked was not due to women entering the labour market. The decline was roughly the same for both sexes.

When real hourly wages subsequently rose very slowly up to the mid-1990s, reductions in working hours ceased. For many, instead, increased working hours became a way of maintaining at least some real growth in annual wages. As stronger growth in real wages began to be registered in the late 1990s and early 2000s, average working hours once again showed a decreasing trend.

An earlier historical illustration of the inverse relationship between real wages and working hours can be taken from the interwar period. In 1920, working hours in industry were shortened by 20 percent when the eight-hour day was introduced (admittedly for six days of the working week). At that time average real hourly wages had increased by 50 percent since 1917. After that real wage growth was insignificant until the mid-1930s, when average working hours started to rise gradually. One can also trace similar relationships internationally.

It should be noted that the average working hours reported here refer to actual time worked. This means, among other things, that changes in sick leave are included. The fact that there have been no further reductions in average working hours in the decade up to 2011 depends therefore partly upon the drastically reduced absenteeism.

The *negotiated* working hours have so far decreased for men in the 2000s and increased for women (hours per week):

	2000	2005	2011
Men	40.5	39.9	39.7
Women	34.2	34.9	35.4
Both sexes	37.6	37.5	37.6

Here it has been assumed that actual average working hours in future will fall by 0.1 percent annually, which represents a conservative adjustment to the long-term historical trend.

Since real hourly wages are expected to rise by 1.9 percent annually, this working-hours assumption means an increase in annual wages per employee of 1.8 percent per year.

Income index

As mentioned at the outset, the income index is intended to reflect the annual average income growth of those who are economically active or at least are in the so-called economically active age. Salaries make up the bulk of such income, but in addition there are income-related social security benefits from sickness and parental insurances, etc., and unemployment benefits. The income-related part of sickness and activity compensation (early retirement) is also included.

Supplementary incomes are likely to develop at the same percentual rate as wages. This means that the income index is also expected to rise by 1.8 percent annually. However, this assumes that the ceilings of the various schemes for supplementary benefits are adjusted to keep pace with income growth, not only with price developments, and that benefit levels remain constant.