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A sick insurance system?

The effects of sick leave on the financial stability of the
Swedish pension system

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Abstract

After the reform in the 1990's, the Swedish pension system is one of the most financially stable in Europe, but the high level of sick leave is a problem left to solve. The purpose of this thesis is to examine the effect of sick leave on the financial stability of the Swedish pension system, today and in the future. We aim to enlighten the link between the sickness insurance and the pension system and show that these two are communicating vessels, why the number of people on sick leave has an impact on the governmental expenditure on pensions. This is done in a three-piece analysis including a numerical model, concluding that the high level of sick leave is a risk factor, especially since the margins in the pension system currently are small. The analysis also enlightens the state's pension entitlements for recipients of sickness and activity compensation, and how these entitlements stretches far into the future. There is a need to get more people receiving sickness and activity compensation back to the labour market to lower the costs of pensions, not least the increasing number of young recipients.

Keywords: sickness insurance, Swedish pension system, sickness and activity compensation, pension costs, welfare state.

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Glossary¹

Aktivitetsersättning	Activity compensation
Allmän pensionsavgift	National pension fee
Allmänna Tilläggspensionssystemet	National Supplementary Pension System
Antagandeinkomst	Assumed income
AP-fond	National Pension Fund
Arbetsförmedlingen	Swedish National Labour Market Administration
Arbets träning	Employment training
Automatisk balansering	Automatic balance mechanism
Balans tal	Balance figure
Delningstal	Life expectancy denominator
Följsamhetsindexering	Flexible indexation
Fördelningssystem	Pay-as-you-go, payg
Försäkringskassan	The Swedish Social Insurance Agency
Försäkringskassans socialförsäkringsnämnd	The Social Insurance Board of the Swedish Social Insurance Agency
Förtidspension/Sjukbidrag	Disability pension
Garantiersättning	Guaranteed benefit
Garantipension	Guarantee pension
Högriskskydd	High risk protection
Inkomstbasbelopp	Income base amount
Karensdag	Waiting period
Närståendepenning	Allowance for care of relatives
Ohälsotal	Figure of ill health
Pensionsavgift	Pension contribution
Pensionsgrundande belopp	Pensionable sum
Pensionsgrundande inkomst	Pensionable income
Pensionsrätt	Pension right
Pensionsunderlag	Pensionable salary
Premiepensionsmyndigheten	The Premium Pension Authority
Premiepensionssystemet	The Premium Pension System

¹ Konsumenternas Försäkringsbyrå, 2001, www.forsakringskassan.se/sprak/eng/

Ramtid	Frame time
Prisbasbelopp	Price base amount
Rehabiliteringspenning	Rehabilitation allowance
Riksförsäkringsverket	National Social Insurance Board
Sjukersättning	Sickness compensation
Sjukförsäkring	Sickness insurance
Sjuklön	Sick pay
Sjukpenning	Sickness benefit
Sjukpenninggrundande inkomst	Income entitling to sickness cash benefit, SGI
Självrisk	Co-insurance
Smittbärfonden	Disease carrier's fund
Vårdbidrag	Childcare allowance
Ålderspensionsavgift	Retirement pension fee

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1. Introduction

According to the OECD, the Swedish pension system is one of the most financially stable in Europe. The reasons are, inter alia, a fairly large labour supply and the pension reform carried out in the late 1990s. However, the accelerating number of people on sick leave is a problem left to solve. Since 1997 the number has doubled and is now the largest in Europe.² Almost 800 000 Swedes, nine percent of the Swedish population, receive benefits from the sickness insurance.³

Since the Swedish pension system is defined contribution, the system is financially stable in the sense that the outlays will never exceed the incomes. But, since the future pension disbursements are affected by the sum of money flowing in to the system, the large number of people on sick leave can result in lowered pensions. The number of people on sick leave affects the financial status of the pension system. The contributions for people on sick leave are lower. This means that less money flows in to the system for each person on sick leave compared to if she or he had been working. Moreover, they do not generate any incomes themselves, implying that the government is forced to step in and finance their pension contributions through taxes.

Yet another problem is the large and increasing number of recipients of sickness benefits who never re-enter the labour market. In the new pension system the disability pension is replaced by sickness compensation or activity compensation. These two benefits are no longer a part of the pension system but of the sickness insurance system. This implies that the benefits do not burden the pension system directly, but indirectly it creates pension costs, because the state has to finance the pension contributions for these individuals incessantly until they reach pension age at 65, in some cases almost a whole working life.

² OECD, 2003:9-12

³ www.forsakringskassan.se/omfk/analys/sjukformaner/

1.1 Purpose

The purpose of this thesis is to examine the costs of sick leave on the Swedish pension system today and in the future. We aim to enlighten the link between the sickness insurance and the pension system and show that these two systems are communicating vessels, and that the large number of people on sick leave can put the well-being of the pension system at risk.

1.2 Delimitations

The focus of the thesis is the effects of the sick leave on the *pension system*. Therefore, we will not concentrate the analysis on the costs of sick leave as such.

The thesis focuses on the *effects* of the sick leave on the pension system. We will not analyse the reasons behind the sick leave.

The analysis is carried out on a system level. We will not describe any costs related to specific employers or employees.

We only concentrate on the income related parts of the systems, and we will not further analyze the guarantee pension.

The thesis deals with the government financed parts of the sickness insurance system and not on the sick pay which is financed by the employers.

1.3 Method

The analysis is established in insurance theory, where we describe the demand, the structuring and the problems of insurance. Through a close empirical description of the current sickness insurance system and pension system the link between the two is enlightened. In order to calculate the costs of sick leave on the pension system we perform a short run and a long run analysis. The short run analysis models the revenues that the system loses in one year. In order to analyse the long run costs we have developed a calculation model. This model shows the future costs for all individuals currently on sick leave until they reach pension age. The methodological aspects of the model will be presented separately in a coming section.

1.4 Material

The material used in the thesis can be divided in three: First, literature describing the theory of insurance; second, empirical material describing the structure of the Swedish sickness insurance and pension system; third, statistical material describing the current situation of sick leave in Sweden today, which will also constitute the basis of our calculation model.

2. Theoretical aspects

2.1 The demand for insurance

Life is associated with risk. Individuals might for different reasons become temporarily or permanently exposed to income losses. Most people want to avoid unexpected income losses and prefer having their income secured throughout their life time. In economic terms, they have a diminishing marginal utility of income - the richer one is, the less utility one gets from one extra unit of income. This means that a certain loss of income would imply a greater loss of utility, than the same gain of income would mean in terms of utility gain. The phenomenon is called risk aversion. A person who is risk averse would even be willing to give up a part of her income to secure the rest of the income no matter what. She demands insurance. The risk-averse behaviour can be shown in figure 2.1.

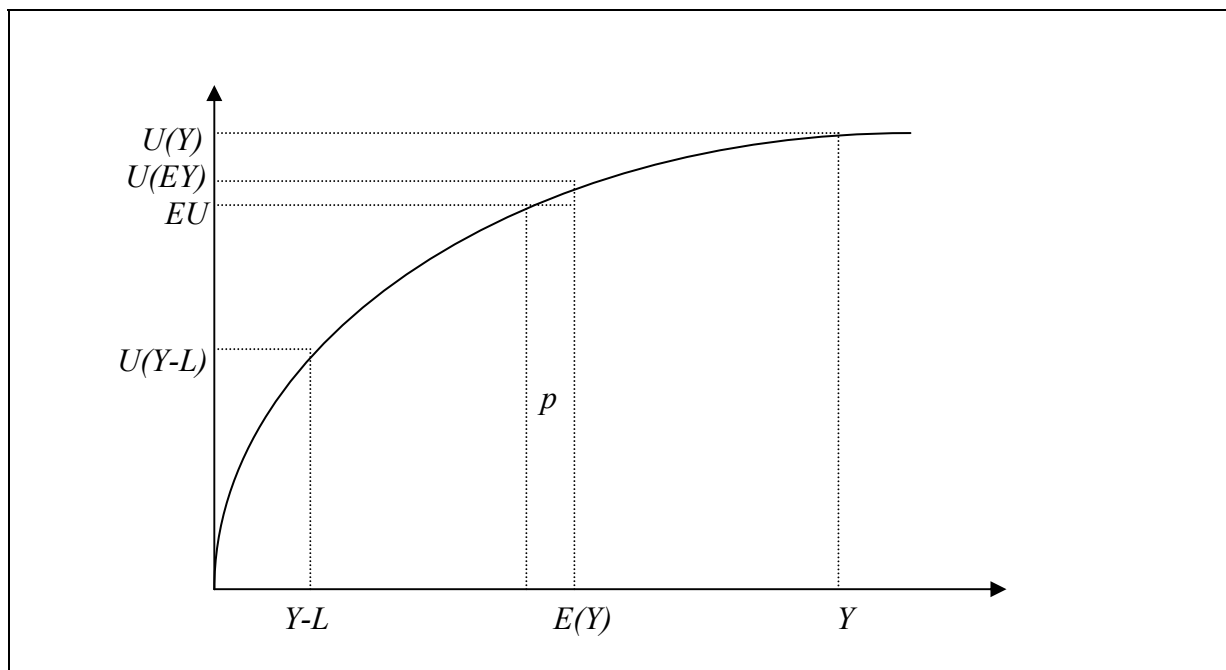


Figure 2.1. Risk premium for risk averse individual. Conolly & Munro, 1999

Initially the individual's income is Y . With a probability of π she risks losing L .

Thus her expected income, $E(Y) = (1-\pi)Y + \pi(Y-L)$

Her utility of expected income = $U(E(Y))$

The individual's expected utility, $E(U) = (1-\pi)(U(Y)) + \pi(U(Y-L))$

As is shown in the figure the individual's utility from expected income is greater than her expected utility. This means that the individual is indifferent between giving up a share of income and keep the rest with certainty, and having a larger expected income but risk to lose it with a certain probability, π . The larger π , the larger the risk premium, p , which is the sum she is willing to pay for the insurance.⁴

2.2 The functioning of insurance – risk pooling

Trying to arrange insurances by one self is inefficient. The reason is that the personal risk of income loss is unknown to every individual. The solution is to cooperate with other persons and put one's money in a common pool. By *risk pooling*, utilizing the law of large numbers, each individual only has to save according to the average risk, which is known, and thus optimising the premiums paid. For the insurance-pool to work efficiently, the sum of the premiums must at least be equal to the sum paid for compensation times the risk that compensation will have to be disbursed, which can be expressed as $p \geq \pi k$. If this is not the case the system will collapse because the money in the pool will not be enough to cover the compensation being disbursed. Thus, to create a stable insurance, the premiums must be set at a high enough level. The more people participating in the pool, the smaller the premium can be.⁵

2.3 Sickness insurance and pension insurance

Life is associated with different kinds of risks, and the individual needs different kind of insurance. There is a difference between the risk of losing income due to sickness or disability and the problem of spreading consumption possibilities over the individual's lifetime. In the first case risk pooling takes place within one generation, and in the second case it takes place between different generations.⁶ In the following section the theories of sickness insurance and pension insurance are described in detail.

⁴ Nicholson, 2002:205

⁵ Swedenborg red. 2003:89

⁶ Söderström, 1996:2

2.3.1 Sickness insurance

Sickness insurance is an insurance covering unpredictable losses of income caused by working incapacity due to illness or disability.⁷ It is in some sense a special insurance system since almost everyone who works may fall ill occasionally. Almost everyone has had to get in touch with the sickness insurance and almost everyone can expect to do so again.⁸

The family might work as an insurance pool for temporary losses of income due to illness. As long as the amounts are small – seen from the perspective of the entire life cycle – the family needs no large buffer to deal with the problem. However, illness may have more than just a marginal effect on the life-cycle income. As time goes by, a family can experience many and long-lasting losses of income with a quite noticeable effect on the standard of living. For a single person, the pain threshold can be rather low.

To solve the problem, organizing “friendly societies” is a solution. This is a pooling institution where people in a certain work place, or living in a certain area deposit part of their salary into a pool and receive compensation when they fall sick. Since the pool is fairly small and the members know each other it is easy to prevent abuse of the system. Friendly societies can be seen as an extended version of the family. The problem is that the friendly society, just as the family is not a big enough insurance pool, if many members fall sick at the same time, or for long periods.⁹

In order for the insurance pool to work properly the pool must not only be large enough but the risk must also be *insurable*, which is defined by the following conditions: the probability of the accident to occur (π) is known and possible to calculate; π is smaller than 1; π is independent between individuals; the individual must not be able to affect π through her own actions.¹⁰ Unfortunately, the risk of falling sick is not fully insurable which means that no efficient market solution will be established.¹¹

2.3.1.1 Social insurance

In most OECD countries, the solution is social sickness insurance through the state, either directly by providing insurance, or indirectly through facilitating conditions in the voluntary

⁷ Swedenborg red. 2003:91

⁸ Rikner, 2002:5

⁹ Söderström, 1996:28

¹⁰ Söderström, 1996:20

¹¹ Edgerton, Kruse & Wells, 2000:2

sector. In the former case, which is the solution in Sweden, the state functions as an immense pool where all citizens put a part of their salary through taxes. In case of illness, they get a sickness benefit from the state, covering the income loss.¹² The state has a far greater ability to spread risks through its significant size, and by its power to make the insurance mandatory it can help avoiding several other problems connected to the sickness insurance market:¹³

One serious problem in sickness insurance is *asymmetric information*. There is asymmetric information connected to illness and working incapacity, because the individual knows more about her health status than the insurer.¹⁴ Asymmetric information is an obstacle for the well functioning of the insurance market. There are two forms of asymmetric information: hidden knowledge also known as *adverse selection*, and hidden action, also known as *moral hazard*.

Adverse selection refers to the difficulty for insurance providers to know if a person is a high risk or a low risk individual. Then they have to charge everyone the same premium, according to the average risk. The result is that only high-risk individuals buy the insurance – the low risk individuals do not, since their risk is below the average. This leads to more claims than expected and losses for the insurance provider.

Moral hazard means that people change their behaviour after they are insured, so the risk of misfortune to occur is larger than before. One might for example redefine the definition of illness, and stay home more often, since the sickness insurance will cover the income loss anyway, leading to too many claims and a break down of the insurance market.¹⁵

Other problems are *free riding* and *perceptual bias*. Free riding means that some individuals in society do not insure themselves but counts on other peoples benevolence. If many people follow this example, the insurance becomes more expensive for those who stay with the pool. Finally the pool is too small to use the law of large numbers, and the system will collapse.¹⁶ Perceptual bias refers to people's incapacity to correctly estimate their chances of ill-health,

¹² Söderström, 1996:11

¹³ Connolly & Munro, 1999:296

¹⁴ Edgerton, Kruse & Wells, 2000:2

¹⁵ Connolly & Munro, 1999:88 ff

¹⁶ Söderström, 1996:22

and the fact that the risk of illness grows bigger towards the end of a person's life, implying that many people do not save enough money, because they rather want to consume at present.¹⁷

Even though adverse selection is not a major issue in the sickness insurance since the risks of different groups are well-known, a mandatory insurance through the state will totally eliminate the problem, since everyone is forced to pay the same premium. It will also eliminate the problems of free riding and perceptual bias, since people do not have a choice – everyone is forced to join the insurance pool.¹⁸

Moral hazard is a genuine problem in the sickness insurance market. The conception of working incapacity due to illness is difficult to ascertain, and is not an “all or none” concept but occurs along a sliding scale. This implies that the individual herself may decide whether or not to use the sickness insurance.¹⁹ The problem of moral hazard is not eliminated by implementing mandatory social sickness insurance, and the state has to find ways to deal with the problem. There are two ways to limit moral hazard, and both are used in the Swedish sickness insurance. The first is monitoring, where the state tries to guard the behaviour of the insured person. The second is co-insurance, meaning that the individual has to pay a part herself every time she uses the insurance. In the Swedish sickness insurance, the co-insurance is expressed in two ways, first through a sickness benefit which is not hundred, but only eighty percent of the salary, implying a reduction in income when sick. Second, through a waiting period, implying that no benefit is being disbursed on the first day of the sickness spell.²⁰

There is a classical problem in setting the benefit and the co-insurance at the right level. People are risk averse and demand a protective sickness insurance, suggesting a low co-insurance. At the same time the insurance cannot be too protective in order to prevent moral hazard, suggesting a high co-insurance. This is a very important issue, because a number of studies have shown a strong correlation between changes in the sickness insurance system and changes in sick leave. Reforms implying more generous compensation tend to be associated with permanent increases in total sick leave per employed and vice versa. Thus in order to

¹⁷ Connolly & Munro, 1999:296

¹⁸ Connolly & Munro, 1999: 291ff

¹⁹ Swedenborg, red. 2003:92

²⁰ Connolly & Munro, 1999:298

minimize the sick leave but still have a protective system, the design of the system is highly important.²¹

As shown above, a mandatory insurance can solve some, but not all of the problems connected to the sickness insurance market. Furthermore, a mandatory insurance is not in itself unproblematic. The system is difficult to administer due to its size and might be badly adapted towards individual preferences, since it offers the same benefits to all citizens. It is also a risk that the social sickness insurance system is expanded over its optimal size when which can be very costly.²²

2.3.2 Pension insurance

A person's life can be divided into different stages: childhood, working life and old age. During the first and the last period of life, the individual earns no income. In spite of this, she wants to consume more or less evenly throughout her entire lifetime. This implies a need to transfer a part of the surplus earned during working life to the other periods. This is referred to as the life cycle hypothesis and the dilemma can be illustrated in a life cycle model.

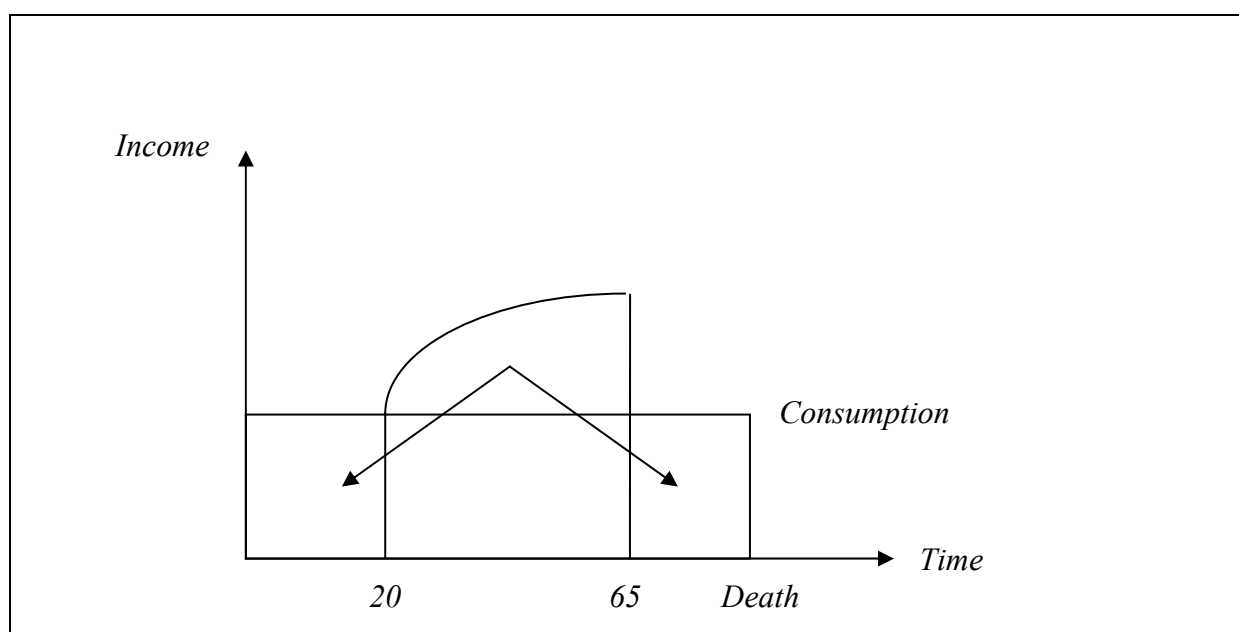


Figure 2.2 The life cycle model. Kruse, 2002

²¹ See for example Henrekson & Persson 2003, Edgerton, Kruse & Wells 2000 and Johansson & Palme 2002

²² Kruse 2002:175

The only way to arrange this transfer of income is through cooperation with other people in society. By cooperating, the individuals create a mutual insurance system. The individual borrows money from persons in working age to finance her childhood. When she reaches working age she must repay the money to this generation who now has reached old age. At the same time, she lends money to the present childhood generation to ensure the financing of her own old age. As long as this insurance contract is not broken, the individual's lifetime income is secured.²³

One of society's most important tasks is to administrate the transfers between generations. This can be done in three ways: through the family, the market and the state. The family is the original way of transferring income between different phases of life. By receiving income from the parents as a child, one is expected to support the present childhood and old age family members when reaching working age. In old age, one is in turn supported by the present working generation. This is an insurance contract within the family. The contract is not based on altruistic preferences, since all individuals gain from family cooperation as long as the contract is not broken.²⁴

The second way of organizing old age insurance is through the market. An obvious difference between the family and the market model is that in the latter there is a direct connection between the individual's earned income and her consumption possibilities. A market based pension system can be administrated in two different ways, by loans or by investment in assets, a so-called funded system.²⁵

The third pooling institution is the state, which has already been described to some extent in previous sections. The state's involvement in old age insurance can differ from case to case. In some societies the governmental intervention is limited. The state serves as a passive actor whose main objective is to facilitate the functioning of existing family and market based systems. In these cases, stability is provided through legislation and regulation by the government.²⁶

²³ Kruse 2002:166

²⁴ Söderström, 1996:3

²⁵ Söderström, 1996:23

²⁶ Söderström, 1996:7ff

In other societies the state has a large responsibility, which is the case in Sweden. As an active player, the state replaces the market and family systems and creates a public pension system. Some state-run pension systems resemble the loan-based market model. Others are organized as an extended family system where all citizens create a large common insurance pool and income is transferred between generations in society. The latter is a so-called *pay-as-you-go system (payg)*.

In a payg system the current working age generation make contributions from their income to the system. These contributions are immediately used as pension disbursements to the current old age generation. When the working age generation reaches pension age, they will in turn be supported by a new generation of people, who now has reached working age. Thus the payg system is based on a social contract between generations, just as in the family system, but in a much larger scale.²⁷

Samuelson's equation expresses the budget restriction of a payg system more formally. Kruse (2002) reformulates the equation as follows:²⁸

$$q * w * L = b * r$$

In this equation, q is the share of the salary by which each worker contributes to the payg system. w is the average wage in society, and L is the labour force. Consequently, the left hand side expresses the sum of all payments made, the inflow to the pension system. b is pension benefits and r is the number of pensioners. The right hand side thus expresses the outflow from the pension system, the sum of payments that the pensioners receive. Equilibrium occurs when the left hand side equals the right hand side. The equation can be rearranged in the following way:

$$q = (b/w) * (r/L)$$

b/w , the *contribution ratio*, expresses the share of the former wage received as a pensioner. r/L , the *old age dependency ratio*, is the number of pensioners in relation to the labour force. The old age dependency ratio is not possible to affect, except in a very long run, since it is a

²⁷ Connolly & Munro, 1999:339ff

²⁸ Kruse, 2002:176

demographic variable. The payg system could be a *defined benefit* system, where the pensioners are guaranteed a fixed level of benefits. This implies that the only variable possible for the state to affect is q . It can also be a *defined contribution* system, where the share of the wage paid to the system by the labour force is fixed. In this case, b is the only flexible variable.²⁹

The well functioning of a payg system depends on the population growth, δ , and the growth in productivity, z , the return in the system is expressed as $(1 + \delta)(1 + z)$. This implies that the return is dependent on the demographic structure in society. If the number of people on the labour market is large in relation to the old age generation, the system is well fed, and the support of the old people is easily covered by the workers contributions. But, if the working age generation is small in relation to the old age generation, the system will face problems, either the contributions of the workers must be increased, or the pension disbursements must be decreased, depending on whether the payg system is defined benefit or defined contribution.

The growth in productivity affects the system through the growth in earnings – if the productivity is increasing the employees are compensated by higher wages. In Samuelson's equation the growth in earnings is shown by changing the variable, w . The left hand side of the equation will thereby increase. Balance in the system is achieved by increasing the benefits in a defined contribution system, or lowering the contributions in a defined benefit system.³⁰

A defined benefit system secures the pensioner's support, but implies a heavy burden on the working generation if the demographic structure or the productivity is unfavourable. The analogous situation occurs in a defined contribution system, where the working generation has a more secure situation in times of poor growth, while the pensioners' benefits decline.³¹

Since pension systems run over a long period of time it is important to make sure the value of the contributions does not decline over the years. Consequently, the payments are index-tied. They might be index-tied to prices, implying that the contributions keep their value in a fixed

²⁹ Kruse, 2002:178

³⁰ Söderström, 1996:27

³¹ Kruse, 2002:173ff

money value, and the benefits are inflation-proofed. The payments can also be indexed-tied to the growth rate, which means that they grow at the same rate as the productivity in society.³² A price-indexed system is growth sensitive. In times of poor growth it is unfavourable for workers compared to pensioners, and the opposite is true in times of rapid growth. A growth-indexed system might be considered more equal in the sense that both workers and pensioners are affected in the same way in good or bad times.

The first generation of a payg system has a large advantage, since they get old age benefits without contributing to the system. This is called a *windfall gain*. The opposite is true for the last generation of a payg system, who has contributed to the system during working age but does not get any benefits.³³

³² Kruse, 2002:4-14

³³ Kruse 2002:173-180

3. The Swedish sickness insurance system

In the following section, the Swedish sickness insurance system is described. First, a historical sketch, second a description of the sick pay, disbursed by the employer, and the sickness benefit, disbursed by the state. The section ends up with a presentation of the sickness compensation and the activity compensation, replacing the former disability pension.

3.1 Background

In Sweden, a mandatory, government-financed sickness insurance system was first introduced in 1955. Since then, the system has been reformed a number of times. From the beginning, the waiting period in the sickness insurance was three days. In 1987 it was removed, to be reintroduced in 1992, after a large media debate.³⁴ The sick pay, disbursed by the employer was introduced in 1992. After several changes it was once more established at two weeks in 2005, however with a third week shared by the employer and the Swedish Social Insurance Agency.³⁵

3.2 The current sickness insurance system

3.2.1 Sick pay

The *sick pay* is 80 percent of the salary from the day after she reported sick. There is a waiting period of one day, with a few exceptions, for example employees who have a well-documented illness can be covered by a *high risk protection* and receive compensation from the first day.³⁶

3.2.2 Sickness benefit

After the first 14 days of sick leave the individual might receive *sickness benefit*, disbursed by the Social Insurance Agency. The full sickness benefit is 80 percent of the individual's income entitling to sickness cash benefit (SGI) multiplied with 0.97. The Social Insurance Agency stipulates the SGI, which is based on present or earlier income from work. The sickness benefit is taxable and pension qualifying in the new Swedish pension system. The

³⁴ Henrekson & Persson, 2003:7, 22

³⁵ Staffan Kahn (Interview)

³⁶ Försäkringskassan, 2003a:11

link between sickness benefits and pension entitlements will be discussed further in a coming section.³⁷

3.2.3 Rehabilitation allowance

Rehabilitation is a term covering all kind of medical, psychological, social and occupational measures aiming at helping a sick person to regain a functional life. Full rehabilitation allowance is 80 percent of the SGI. The rehabilitation allowance is taxable and pension qualifying.³⁸

3.2.4 Sickness and activity compensation

If the working incapacity is lasting, the sickness benefit is replaced by *sickness compensation* or *activity compensation*. These two benefits replace the former disability pension since 2003.³⁹ Individuals between 30 and 64 years of age qualify for the *sickness compensation*. It is based upon previous incomes and can be disbursed for a limited period, or for good if the working capacity is permanently impaired. Full income related sickness compensation is 64 percent of the individual's assumed income. The assumed income is the average of the three highest yearly incomes within a frame time depending on the individual's age. The income related part of the sickness compensation is taxable and pension qualifying. If the individual has no or very low income, she receives a guaranteed benefit of maximum 2.4 price base amounts. The guaranteed part of the sickness compensation is not pension qualifying.⁴⁰

The Social Insurance Board of the Social Insurance Agency makes the final decision of granting sickness compensation. At any time, the Social Insurance Agency might carry out a new estimation of the working capacity.⁴¹

People between 19 and 29 years of age receives *activity compensation* instead of sickness compensation. The regulations and qualifications surrounding the two benefits are analogous. The guaranteed benefit from the activity compensation varies however from 2.1 to 2.35 price base amounts and increases with age.⁴²

³⁷ Försäkringskassan, 2003a:10-14

³⁸ www.forsakringskassan.se/pdf-broschyr/faktablad/rehab.pdf

³⁹ www.slf.se/upload/5641/sjukers.pdf

⁴⁰ Försäkringskassan, 2004:10

⁴¹ Försäkringskassan, 2004:5-8, 17

⁴² www.forsakringskassan.se/privatpers/sjuk/lange/aktiviteters/

4. The Swedish pension system

4.1 Background

The Swedish pension system has its roots in the early twentieth century. The pension law of 1913 granted all Swedish citizens a small amount of money during their old age. In 1948, the more generous *Folkpensionssystemet* was founded. In 1960, the National Supplementary Pension System was set up. It was earnings-related, mandatory, defined benefit and payg. It was set up during a period of rapid economic growth and a favourable demographic structure. In 1998, after several years of political debate, a decision was taken in the Swedish parliament, Riksdagen, to reform the system.⁴³ In 2003 the new system was fully implemented.⁴⁴

4.2 The reformed pension system

The current Swedish pension system consists of an earnings-related, contributory scheme and a non-contributory, tax-financed guarantee pension scheme.⁴⁵

4.2.1 The earnings-related pension

All people working in Sweden receive the earnings-related pension. The contribution rate is 18.5 percent of the individual's income. 16 percent are payg and defined contribution. All contributions are temporarily transferred to four National Pension Funds, before they are distributed to the pensioners.⁴⁶

The remaining 2.5 per cent are funded in the *Premium Pension System*, administered by the *Premium Pension Authority (PPM)*. People contribute to their own *PPM-account* and the money is invested on the capital markets.⁴⁷

4.2.2 Pension rights

In the earnings-related part of the Swedish pension system it is the lifetime income that determines the level of benefits received as a pensioner. From the age of 16 the individual can earn *pension rights* who are accumulated and transformed to pension benefits when a

⁴³ RFV/Socialdepartementet, 2003a:4

⁴⁴ RFV/Socialdepartementet, 2003a:23

⁴⁵ RFV, 2004a:3

⁴⁶ RFV, 2004a:33.

⁴⁷ RFV/Socialdepartementet, 2003a:9

person retires. The pension rights are mainly based on the *pensionable income*, but can also be based on a *pensionable sum*. The two form the *pensionable salary*. As pensionable income counts:

- Income from employment or other gainful occupation (note that the income related part of the sickness and activity compensation counts as income from employment, and thus as a pensionable income.)
- Social security benefits (among these sick pay, sickness benefits and rehabilitation allowances)

The reformed pension system considers the fact that people for different reasons might leave the labour market during their career. Therefore the fictive incomes from the following activities are also made pension qualifying and they form an individual's pensionable sum:

- Childcare years
- Higher education
- National services.
- The income related part of sickness and activity compensation

The former salary and the type of activity determine the amount of pension rights received. The Swedish government pays the pension fee for people who, by any of the reasons above, do not earn income in the labour market.⁴⁸ This thesis focuses on the governmental pension expenditures of sickness benefits, rehabilitation allowances and sickness and activity compensation.

4.2.3 Contributions

The employee pays a *national pension fee* of 7 percent and the employer a *retirement pension fee* of 10.21 percent. The two of them sum up to 17.21 percent. But, the contributions calculated from the *pensionable salary* are equal to 18.5 percent. The two percentages differ from each other but expresses in practice the same amount of contributed money. The reason is that the individual pension fee of 7 percent is deducted from the pensionable salary when the contribution of 18.5 percent is calculated. There is a ceiling in the *pensionable income*, meaning that a person receives pension rights up 7.5 income base amounts. The contributions

⁴⁸ RFV, 2001:26ff, www.rixlex.riksdagen.se, Göran Rehnby (Interview)

above this level are transferred to the public budget as a sort of tax, and are not pension qualifying.⁴⁹

4.2.4 Adjustment to demographic changes

As a large share of the Swedish pension system is payg, the demographic structure has a great impact on the financial stability of the scheme. In the current pension scheme, the pensions are adjusted to the demographic structure by a *life expectancy denominator* determined by the remaining life length of the population.⁵⁰

4.2.5 Adjustment to earnings

The current income pension is indexed to earnings-growth. The reason is that the living standard of the pensioners should not lag after the working population. But, if the increase in earnings would be lower than the increase in prices, the pensioners would receive a pension that lag behind the prices, and the pensions are thus not inflation-proved.⁵¹

4.2.6 The automatic balance mechanism and the flexible indexation

In the Swedish pension scheme there is an *automatic balance mechanism* adjusting the pensions in the payg system to the prevailing economic conditions. If there is a downturn in the economy, the pensions will automatically be lowered. The automatic balance mechanism is determined by the relationship between the assets and liabilities in the pension system. The automatic balance mechanism makes the system financially stable but might result in lowered pension benefits if the liabilities are larger than the assets.⁵²

4.3 The guarantee pension

The guarantee pension is a basic security pension paid to any individual who has had no or low earnings. In order to receive the full guarantee pension the individual must have lived in Sweden or a EU/EEA country for 40 years from the age of 25.⁵³

⁴⁹ www.forsakringskassan.se/privatpers/sjuk/lange/aktivitetsers/

⁵⁰ RFV/Socialdepartementet, 2003a:13

⁵¹ RFV/Socialdepartementet, 2003a:19, RFV, 2004A:5.

⁵² RFV/Socialdepartementet, 2003a:21

⁵³ RFV/Socialdepartementet, 2003b:6

5. Recent developments in sick leave

In the following section we will sketch the developments concerning sick leave from the mid 1980's until today. The number has changed quite dramatically several times, but the actual health status is not the only explanation. A study published by the Institute for International Economic Studies of Stockholm University shows that the correlation between reforms in the sickness insurance system and changes in sick leave is strong. Reforms implying more generous compensation tend to be associated with permanent increases in sick leave and vice versa.⁵⁴ Sick leave is also correlated with the state of the economy. Low growth and high unemployment imply a low level of sick leave, and when the economy flourishes, the level of sick leave increases. Researchers propose several hypotheses behind this phenomenon. One is that “weak” people enter the labour force in times of good growth, and are kicked out when the growth is low. Another is that a bad state of the economy disciplines the employees.⁵⁵ Changes in attitudes towards what is considered a valid reason for sick leave might be a third explanation behind changing levels of sick leave.⁵⁶

5.1 Sickness benefits

During the second half of the 1980s the level of sick leave increased as the unemployment decreased and peaked at 320 000 recipients in 1988.⁵⁷ Between 1992 and 1997 the sick leave decreased from 7.5 to 5 percent of the working population. The reason was high unemployment, but also changes in the sickness insurance; the benefit levels were lowered and the eligibility criterion was tightened.⁵⁸ In 1997 the sick leave started to increase, thanks to the recovering economy and stricter attitudes towards granting disability pension. The fastest increase occurred among white collar workers, even though the total level for this group is still lower than for blue collar workers.⁵⁹ The number continued to increase until 2003, and by then the number of recipients was 284 000. After this peak, the number started to decrease for the first time since 1995, and has continued downwards.⁶⁰ The decrease is partly explained by a flow to sickness compensation, but also changes in methods and rules in

⁵⁴ Henrekson & Persson, 2003:27

⁵⁵ Hogstedt a.o. (red.), 2004:57

⁵⁶ Swedenborg (red.), 2003:54ff samt 85, Dagens Nyheter 2004-09-17

⁵⁷ www.scb.se/templates/Product____7820.asp

⁵⁸ OECD, 2003:67

⁵⁹ www.scb.se/templates/Product____7820.asp

⁶⁰ Arbetslivsfakta nr 2 2004:2

the sickness insurance and an increased number of part time sick leave.⁶¹ By the end of July 2005 about 240 000 people received sickness benefit or rehabilitation allowance.⁶² The table below illustrates the sex- and age distribution, as well as the educational background and the length of the sickness spell among people receiving sickness benefit:

Sex		Age ⁶³		Length, days ⁶⁴		Educational background ⁶⁵		
Women	64%	16-19	0.1%	1-14	2%	Primary	27%	(22%)
Men	36%	20-29	7%	15-29	6%	High school	43%	(42%)
		30-39	21%	30-59	7%	University	30%	(36%)
		40-49	27%	60-89	7%			
		50-59	32%	90-179	17%			
		60-64	13%	180-364	17%			
		65-	0.5%	365-730	22%			
				731-	22%			

Table 5 A. Sex-, age- and educational distribution among people on sick leave, January 2002. RFV, 2002

During the first years of the 21st century the long term sick leave increased. In January 2004, 48 percent of the sickness spells were longer than one year.⁶⁶ Recently, the plus one year-spells has started to decrease – in January 2005, they constituted 44 percent. But, no reason for excitement - 52 percent of the closed “plus one year-spells” were turned into sickness compensation.⁶⁷

5.2 Disability pension/Sickness and activity compensation

Since the beginning of the 1990's the number of disability pensioners has increased continuously. In 1996 they were 419 000 and in 2003 they were 507 000, a twenty per cent increase.⁶⁸ In 2003 the disability pension was dissolved and replaced by the sickness and activity compensation and was incorporated in the sickness insurance system. One motive was to create a more all-embracing protection for sick and disabled people.⁶⁹

⁶¹ RFV, 2004-08-19

⁶² Försäkringskassan, 2005-08-19

⁶³ Note the difference in age span

⁶⁴ Note the difference in number of days

⁶⁵ Numbers in brackets reflects the total working population

⁶⁶ Andersson a.o., 2004:25

⁶⁷ RFV, 2004-09-17

⁶⁸ http://statistik.forsakringskassan.se/portal/page?_pageid=47,46541&_dad=portal&_schema=PORTAL

⁶⁹ www.slf.se/upload/5641/sjukers.pdf

The recipients of sickness and activity compensation has not seized to increase, in December 2004 they were 540 000. An alarming factor is that a growing share of the recipients are young, nineteen per cent of the new recipients in 2004 was under the age of 40.⁷⁰

Sex		Age ⁷¹	
Women	59%	16-19	0.5%
Men	41%	20-29	3.5%
		30-39	8%
		40-49	19%
		50-59	39%
		60-64	30%

Table 5 B. Sex- and age distribution among people receiving sickness compensation, Dec.2004
http://statistik.forsakringskassan.se/portal/page?_pageid=47,46541&_dad=portal&_schema=PORTAL

5.3 The figure of ill health

To get an all-embracing picture of the ill health, one measures the figure of ill health including sickness benefit, rehabilitation allowance and sickness and activity compensation. It is measured in average days paid to people aged 16-64. Currently 800 000 people receive some kind of assistance from the sickness insurance system. As shown in the figure, it is slightly decreasing, but the only component decreasing is the sickness benefits. The sickness and activity compensation was increasing which reaffirms the fact that people switch from sickness benefit to sickness compensation⁷².

⁷⁰ http://statistik.forsakringskassan.se/portal/page?_pageid=47,46541&_dad=portal&_schema=PORTAL

⁷¹ Note the difference in age span

⁷² Försäkringskassan, 2005-08-19

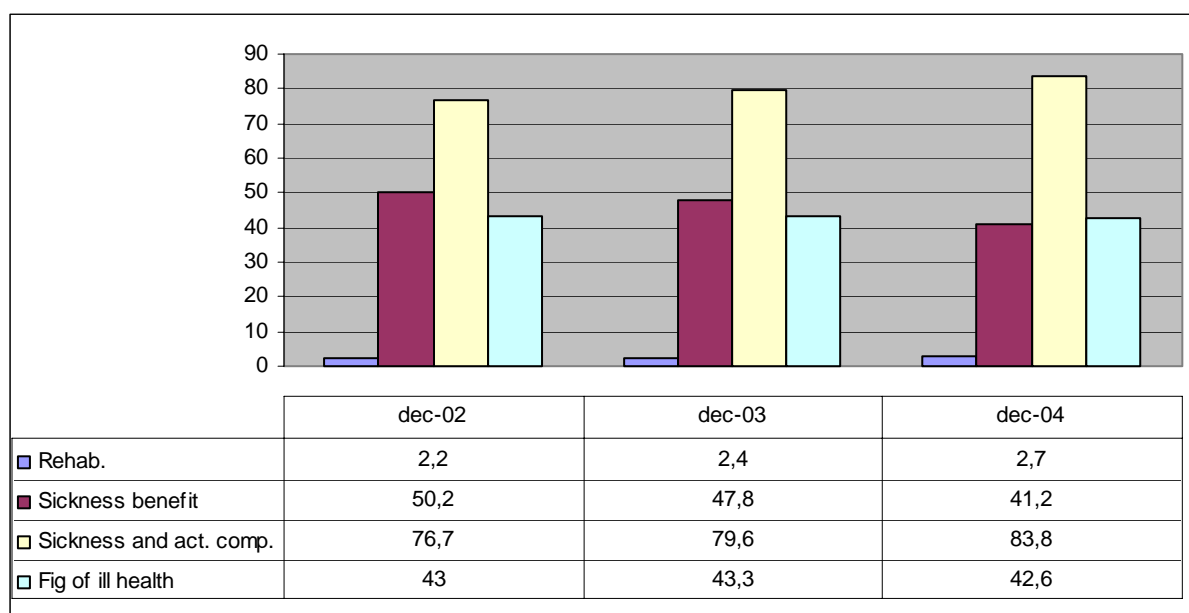


Figure 5.1 The figure of ill health, 2002-2004, average number of days, population 16-64. Försäkringskassan, 2005-08-19

5.4 Forecasts

Since 1997 the government's expenditures on sickness insurance has doubled, due to the increased ill health. In 2004 the total costs were 120 billion sek, 5.5 per cent of the Swedish GNP.⁷³ Recently, the total expenditures has started to decrease, due to the decreasing level of sickness benefit. The Swedish Social Insurance Office estimate the decreasing trend to continue, even if the expenditures on sickness compensation will increase in the years to come. The table illustrates their prognosis.⁷⁴

Benefit	2004	2005	2006p	2007p	2008p
Sickness benefit	35.9	33.0	29.0	26.0	24.3
Sickness and act. compensation	54.2	57.2	59.3	60.4	61.8
Rehab. Allowance	2.3	2.1	1.8	1.6	1.5
Total	92.4	92.3	90.1	88.0	87.6

Table 5 C. Costs of sickness insurance except pension fees, 2004-2008, billion SEK. Försäkringskassan, 2005-08-02⁷⁵

⁷³ Andersson a.o., 2004:25

⁷⁴ Försäkringskassan, 2005-08-02

⁷⁵ p = prognosis

6. Analysis

The analysis is split into three parts; first we explore the link between the Swedish sickness insurance system and the pension system. This is essential, because the link between the two systems is the reason why the number of people on sick leave affect the financial stability in the pension system.

Second, we investigate the short run effects of sick leave on the pension system. We study how much money the state pays to the pension system each year for people on sick leave. Then we study the yearly costs related to the fact that the pension payments for the recipients of sickness benefits are based on less than one hundred percent of their salary.

Third, we analyse the long run effects of sick leave on the pension system. To make these calculations, we have developed a numerical model. All people do not stay in sick leave only for a year, some might even never come back to the labour market, which implies several years of pension payments for the state. How much money has the state committed to contribute to the pension system in the future for today's recipients of sickness benefits, and how much money will the pension system loose in the future because the pension payments for these people are based on less than one hundred percent of the salary?

6.1 The link between the sickness insurance system and the pension scheme

An individual receiving benefits from the sickness insurance is guaranteed pension rights during the period of absence from the labour market. The Swedish state is responsible for the contributions to the pension scheme for these people. The amount of money that is contributed to the pension scheme for individuals on sick leave depends on their former income of work and the benefits received during the sick leave. The table below summarizes the different contribution rates and benefits:

Source of income	Wages/Benefit qualifying level	National pension fee	Retirement pension fee	Pension contribution for sickness and activity compensation	Sum of contributions
Income from work	100 %	7%	10.21% ⁷⁶	-	17.21%
Sickness benefits	80 % of SGI × 0.97	7%	10.21% ⁷⁷	-	17.21%
Sickness and Activity compensation	93 % of assumed income	-	-	18.5%	18.5%

Table 6 A. Contribution rates to the pension system for different social security benefits. RFV, 2004a

6.1.1 Income from work

The contribution rate for an individual who receives income from work is equal to 17.21 percent of the salary. The contribution is calculated from the entire salary. The employer is responsible for the pension contribution of 10.21 percent and the employee for the national pension fee of 7 percent. However, there is an income-ceiling of 7.5 income base amounts per year. The total contribution can be calculated by the following formula:

$$\text{Contribution} = \text{Salary}^{78} \times 0.1721$$

6.1.2 Sickness benefit

To recapitulate, the *sickness benefit* is 80 percent of the SGI multiplied with 0.97 from the second day of the sickness spell. The Social Insurance Agency stipulates the individual's SGI and the pension contribution is equal to 17.21 percent of this amount. The Swedish government is responsible for the total contribution. The contributions to the pension scheme for individuals receiving sickness benefits can be calculated by the following formula:

$$\text{Contribution} = \text{SGI} \times 0.8 \times 0.97 \times 0.1721$$

6.1.3 Sickness and activity compensation

In the reformed pension system the income related part of the sickness and activity compensation counts as income from employment, and thus as pensionable income. As previously mentioned this part of the sickness and activity compensation also confer rights to a pensionable sum. To calculate the pensionable sum for a person receiving income related sickness or activity compensation the following formula is used:

⁷⁶ Disbursed by the employer.

⁷⁷ Disbursed by the government

⁷⁸ Salaries up to the ceiling of 7.5 base amounts.

$$\text{Pensionable sum} = (\text{Assumed income} \times 0.93) - \text{Pensionable Income}$$

This implies that if the pensionable income is high enough, the pensionable sum can be zero, and pension rights are based on the pensionable income only, just as for employees. The individual's pensionable income and pensionable sum added form the pensionable salary from which the pension rights are calculated. As shown in the table above, the pension fee for people receiving income related sickness or activity compensation are 18.5 percent of the assumed income times 0.93, or 18.5 percent of the pensionable salary. The figure illustrates the connection:

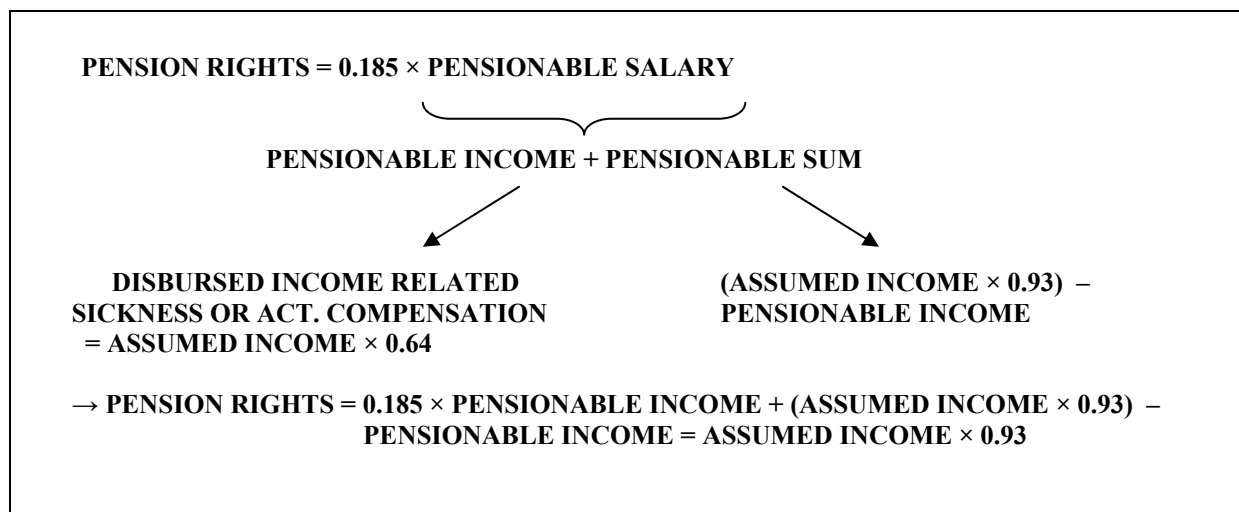


Figure 6.1 Pension rights for individual receiving income related sickness or activity compensation. RFV, 2001:26ff

The contributions to the pension scheme for individuals who receive sickness and activity compensation can thus be calculated through the following formula:⁷⁹

$$\text{Contribution} = \text{Assumed income} \times 0.93 \times 0.185$$

6.2 Short run effects

The contributions to the pension scheme come from three main sources of pension fees: on income from work, on transfers and on pensionable sums. In 2004, the total contributions to the pension scheme were 206 417 million SEK. The pension fees from income from work was

⁷⁹ www.rixlex.riksdagen.se, Katarina Svärd (Interview)

the largest source of contribution and was equal to 171 760 million or 83.2 percent of the total contributions. The pension fees on social security benefits were equal to 17 985 million SEK or 8.7 percent of the total contributions:

Contributions from:	National pension fee (7%)	Retirement pension fee (10.21%)	Pension fee (18.5%)	Total pension fees	Percentage of total pension fees
Income	106 666	65 094	-	171 760	83.2%
Sickness benefits	4 481	3 073	-	7 554	3.7%
Rehabilitation allowance	226	155	-	381	0.2%
Allowance for care of relative	8	5	-	13	0.0%
Disability benefits	436	298	-	734	0.4%
Part time pension	12	8	-	20	0.0%
Parental insurance	2 160	1 481	-	3 641	1.8%
Childcare allowance	200	137	-	337	0.2%
Unemployment benefits	2 937	2 014	-	4 951	2.4%
Educational benefits	26	18	-	44	0.0%
Artist's benefits	4	3	-	7	0.0%
Disease carrier's fund	1	1	-	2	0.0%
Sickness and activity comp.	-	-	10 050	10 050	4.9%
Childcare years	-	-	4 051	4 051	1.9%
National services	-	-	109	109	0.0%
Education	-	-	2 763	2 763	1.3%
Total contributions	117 157	72 287	16 973	206 417	100.0%

Table 6 B. The sources of contributions to the Swedish pension system. Försäkringskassan, 2005

Since the Swedish government is responsible for the pension contributions for individuals receiving benefits from the sickness insurance, there is a clear link between the number of recipients and the public spending on pensions. If these individuals would have worked they would have paid the retirement pension fees themselves and their employers would have paid the retirement pension fees. The pension fees for individuals receiving benefits from the sickness insurance were are financed by taxes and is a burden on the tax payers. However, when the government makes these contributions the financial stability of the pension scheme is secured and the costs of pensions are not transferred to future generations.

The governmental contributions to the pension system for the people receiving sickness benefit and rehabilitation allowance amount to 7 935 million SEK in 2004. As previously described, the full sickness benefit or rehabilitation allowance amount to 80 percent of the SGI, multiplied by 0.97. Thus, if an individual had been part of the labour force, the contribution would have been bigger. The exact difference can be shown by the following calculation:

$$7\,935 / (0.8 * 0.97) \approx 10\,226 \text{ million SEK}$$

This calculation shows that if the people receiving sickness benefits or rehabilitation allowance today would have been part of the labour force, the payments to the pension system would have been 10 226 million SEK, instead of today's 7 935. In one year, the pension system loses 2 291 million SEK in revenues, which is 1.1 percent of the total yearly contributions.

It is important to keep in mind that the scenario referred to above is not realistic. A society without people falling sick does not exist, and it is vital in all societies to have a safety net to protect people, such as the sickness insurance system. The meaning of the analysis is not to insinuate that all the sick people today could have been on the labour market, but to show the fact that the sickness insurance system and the pension system are related, and that the pension system will face large costs today and in the future, because of this fact.

It is also important to remember that the short run calculations are somewhat hypothetical, since we cannot exactly stipulate the salary that these individuals would have had if they were on the labour market.

6.2 Long run effects

In the previous section we investigated the yearly losses of revenue that the pension system faces because the pension contributions for people receiving benefits from the sickness insurance are not based on hundred percent of the salary. This section focuses on the long run costs, which are the total costs for the remaining years that an individual receive benefits. The costs are estimated in our numerical model, which will be presented in this section.

According to "*Social Insurance in Sweden 2004*", published by the Swedish Social Insurance Agency, the average length of a sickness spell is 136 days.⁸⁰ The average person receiving sickness benefit does so for four and a half months. This implies that a long run analysis of the loss of revenue caused by the sickness benefits is not meaningful, the time span is too short. One can argue that it is meaningful since new individuals constantly enter the system.

⁸⁰ RFV, 2004b:143

Yet it is difficult to make any calculations since it is difficult to know how the number of individuals receiving sickness benefit will change in the future.

When it comes to sickness and activity compensation, the long run analysis is highly interesting. The two are replacing the disability pension since 2003. Although the intention behind the reform was to make the benefit less permanent, in practice, they are.⁸¹ This means that a person can receive benefits for many years, in most cases for the rest of the working life. Since the conditions of the two benefits are analogous as pointed out in the empirical section, they will be treated as one in the analysis, and the recipients of the two will be added. The benefit is from now on simply abbreviated as SAC.

The large number of individuals receiving SAC is a problem, not only today but also in the future. As the Swedish government is responsible for the contributions to the pension scheme for these individuals there will be large pension undertakings to deal with in the future. In this section a numerical model will be used to estimate these pension costs for the Swedish government.

6.2.1 Material

To be able to calculate the pension costs, the following variables will be used:

- The number of recipients of SAC divided in cohorts from 16 to 64 years of age, adjusted for the recipients with guaranteed benefit only, (r).
- The number of remaining years until old-age retirement for each cohort, (n).
- The death rates of each cohort, (d).
- The yearly average assumed income y , (b).

Data of the average benefits for 2004 are not yet available, why we use the 2003 statistics. This can be justified considering the present low inflation rate, why we can assume the numbers are more or less constant.

In December 2004, 539 642 individuals received SAC. The table shows the sex and age distribution and the corresponding average monthly and yearly benefits.

⁸¹ www.slf.se/upload/5641/sjukers.pdf, RFV2004-09-17

Age groups	Average benefit, Women	Average benefit men	Average benefit both men and women	Assumed income	Average yearly assumed income
16–19	7 423	7 445	7 434	11 616	139 388
20–24	6 955	7 133	7 044	11 006	132 075
25–29	7 080	7 544	7 312	11 425	137 100
30–34	7 235	7 809	7 522	11 753	141 038
35–39	7 366	8 209	7 788	12 169	146 025
40–44	7 367	8 368	7 868	12 294	147 525
45–49	7 483	8 587	8 035	12 555	150 656
50–54	7 632	8 865	8 249	12 889	154 669
55–59	7 870	9 390	8 630	13 484	161 813
60–64	8 123	9 996	9 060	14 156	169 875
Total	7 453	8 335	7 894	12 334	148 013

Table 6 C. Average monthly and yearly SAC benefit, December 2003, distributed according to sex and age. RFV, 2004b.

It is only the income related part of the SAC that is pension qualifying. This implies that the individuals receiving only the guaranteed benefit will be excluded from the calculations. The number of individuals in the model therefore diminishes to 479 049. As the table below shows, some recipients receive both the income and the guaranteed benefit. It has not been possible to distinguish the share of income related and guaranteed benefit, why we have assumed that these individuals only receive the income related benefit, which is pension qualifying. This lead to an overestimation of the pension costs in the model. As the share of individuals receiving income related benefit is low among the younger recipients, this mainly affects the pension costs of these individuals.

Age groups	All individuals	Individuals with only or partly income related benefit	Individuals with some share of guaranteed benefit	Individuals with only guaranteed benefit
16 - 19	2 937	7	2 937	2 930
20 - 24	8 950	768	8 712	8 182
25 - 29	10 449	3 178	8 829	7 271
30 - 34	16 309	10 532	12 563	5 777
35 - 39	29 229	24 205	20 378	5 024
40 - 44	42 681	37 363	29 283	5 318
45 - 49	57 990	52 271	38 880	5 719
50 - 54	81 658	75 144	52 776	6 514
55 - 59	127 715	120 609	76 754	7 106
60 - 65	161 724	155 017	89 039	6 707
All individuals	539 642	479 094	340 151	60 548

Table 6 D Individuals receiving SAC in December 2004 distributed on income related and guaranteed benefit. Joakim Söderberg (Interview).

It is possible to receive full, three fourth, two thirds, half or one quarter of the benefit, depending on the extent of the working incapacity. In December 2004, 74 percent of all recipients received the full benefit, 2 percent three fourth, 0,1 percent two thirds, 18 percent half and 6 percent one fourth benefit. These percentages stay more or less constant throughout the different age groups. This makes it possible to add together the individuals not receiving full benefit to simplify the calculations. Two persons receiving half benefit correspond to one receiving full benefit, four persons receiving one fourth correspond to one receiving full benefit and so on. We do not know how many of the individuals receiving both income related and guaranteed benefit who has full, three fourth, two thirds, half or one fourth benefit. We have assumed the recipients are distributed in same proportions as the total amount of individuals receiving SAC. By doing this adjustment, the total number of full SAC benefits sum up to 411 616, which is the number that will be used in the numerical model⁸² (see appendix A).

The average benefit for individuals receiving SAC was 7 894 SEK in 2004. The benefit is 64 percent of the assumed income which implies that the assumed income can be calculated by dividing the SAC benefit with 0.64 which in this case gives an assumed income of 12 334 SEK. To recapitulate, the pension fee of 18.5 percent is calculated from 93 percent of the assumed income.

It is difficult to estimate how the assumed income of the recipients will evolve in the future. The level of the assumed income will have an impact on the pension costs. In this model we have made the assumption that the assumed income will follow the actual levels of the different age groups that are shown in the table above. The monthly assumed income of an individual aged 16 will be 11 616 SEK, at the age of 20, 11 006 SEK and at the age of 25, 11 425 SEK and so on.

6.2.2 Method

We have developed a numerical model through which we are able to calculate the pension costs of individuals receiving the SAC. The Swedish Social Insurance Agency has done calculations considering the insurance costs of the SAC, though not including the pension costs. When doing these calculations we have assumed a zero percent discount rate and thus a

⁸² See appendix

fixed price level is fixed throughout the entire period. It is difficult to stipulate a plausible discount rate and choosing the wrong discount rate might bias the model. The results from the model will thus be presented in the price level of 2004.

In our model the recipients have been divided into 49 cohorts, from the age of 16 to the age of 64. The pension costs (PC) of each cohort will be calculated separately. The first step is to calculate the accumulated amounts of assumed incomes of year 1 by multiplying the number of recipients (r) in each cohort by the assumed incomes (b). As 93 percent of the assumed income is pension qualifying and the pension fee is 18.5 percent of the pensionable salary, when calculating the pension cost, 93 percent of the assumed income will be multiplied by the 18.5 percent. This calculation will be repeated for all the remaining years (n) until the old-age retirement. For the first cohort, aged 16, the pension cost is the sum of all the 49 remaining years. The total pension cost thus the sum of all cohorts remaining years until old-age retirement. The numbers have been adjusted to age specific death rates (d) and to an increase in the benefit level each fifth year. Our calculations are expressed in the following formula:

$$\text{Pension cost} = 0.93 \times 0.185 \times r \times b \times n \times (1-d)$$

There are factors of uncertainty that must be mentioned. First, the model does not consider the possibility that people receiving sickness or activity compensation return to the labour market, which might lead to an overestimation of the pension costs in the long run. According to the National Social Insurance Board, very few recipients do however return to work.⁸³ Second, due to a lack of individual data we have based the model on average values, for example the average assumed incomes. Third, the calculations stretches over a long period of time. The sickness insurance system has been reformed several times throughout history, and are likely to do so again in the future, which would have a direct impact on the pension costs for people receiving benefits from the sickness insurance. These factors implies that the results should be interpreted with a certain amount of caution.

⁸³ RFV, 2004-09-17

6.2.3 Results

Total amount of assumed incomes	710 580 533 922
Total pension costs	122 255 380 861
Total pension cost 2004	11273525430

Table 6 E The results of the numerical model.

The numerical model predicts that the total pension undertaking for individuals who received the SAC in 2004 will be about 122 billion SEK for the coming 49 years until all the recipients have become 65 years. It is clear that this is a considerable amount of money. It is so large it might even be quite intangible and a point of reference is necessary. For example one can put the results in relation to the total yearly cost of the Swedish sickness insurance, which was 120 billion sek in 2004 or 5.5 per cent of the Swedish GNP for the same year.⁸⁴

It is important to keep in mind that the model is static, and only considers the recipients of SAC in December 2004. As was stated in the section of recent developments, the number of recipients is increasing and has been doing so for quite some time. This means that new individuals constantly enter the system, leading to new pension undertakings adding each year.

To verify the accuracy of the model, the actual pension cost for 2004 has been compared with the costs that has been estimated in the model. Our model estimates the pension costs for 2004 to 11 300 million SEK. According to the 2004 annual report of the Swedish pension system the costs of pensions for individuals receiving the SAC were 10 050 million SEK. The possible explanation behind the overestimation in the model has been discussed earlier. As we have assumed that the individuals receiving both the income related and the guaranteed benefit only receive the income related benefit, the pension costs will be overestimated.

Although the model overestimates the pension costs to some extent, it is still a clear illustration of the somewhat hidden costs of that Swedish government has to pay in addition to the costs for the sickness insurance in itself. Another merit of the model is that it explicitly enlightens the serious consequences of the large number of young recipients of SAC.

⁸⁴ Andersson a.o., 2004:25

7. Concluding Remarks

7.1 The life cycle hypothesis and the welfare state as a large insurance pool

As pointed out in the theoretical section, the life cycle hypothesis implies that in order to spread the consumption possibilities evenly throughout the lifetime, the individual must transfer part of the surplus earned during working life to the other periods. The only way to solve this dilemma is through cooperation with other individuals. The welfare state can be seen as a large insurance pool where this cooperation takes place. But for the insurance pool to function, the contributions flowing into the pool must be larger or at least equal to the sum of benefits flowing out of it. For the welfare state, this implies that a certain share of the population must be on the labour market contributing to the welfare state through taxes in order to cover for the share of the population that for different reasons are outside of it. As for any insurance pool, if the condition, $p \geq \pi k$, is not fulfilled the welfare state will not function properly.

7.2 The Swedish pension system – financially stable, but at the expense of lowered pensions?

The Swedish pension system is defined contribution. If one recalls the reformulated Samuelson's equation,

$$q \cdot w \cdot L = b \cdot r$$

this means that q is fixed. If L is low it implies that in order for the system to be in balance, b must be lowered, unless the growth in wages is not exceptional. The Swedish pension system will always be financially stable in the sense that the outlays will never exceed the incomes. But the risk is that in a situation where the sum of contributions, the left hand side of the equation, is low in relation to the sum of benefits, the right hand side, the pensions might be lowered in order for the former not to exceed the latter. If this happens, there is a risk that the pensions does not grant the elderly a reasonable standard of living, and then the system has lost its purpose as an insurance.

But is the large number of people receiving benefits from the sickness insurance system a factor that can push the pension system over the edge and make the automatic balancing

operative resulting in lowered pensions? The current financial situation of the Swedish pension system is not too prosperous. The buffer funds are shrinking and the difference between the assets and the liabilities was only 9 billion SEK in 2004, compared to 58 billion SEK in 2003.⁸⁵ As our short run analysis shows, regardless of the fact that the state makes the contributions for the people on sick leave, the revenues to the pension system were about 2.3 billion SEK less in 2004 than if hypothetically all people on sick leave would have been on the labour market. It is clear that the sick leave puts the Swedish pension system at risk, since the margins in the system currently are quite small. It is also clear that this risk would be smaller if more people came back to the labour market.

Moreover, people on sick leave do not benefit from the growth in wages, since the benefits are indexed to prices. Their wage trend will most certainly be much flatter, implying smaller contributions to the pension system. If they stay in sick leave, they will also miss out on promotional opportunities leading to higher salary.

Worth noting is also that the sickness compensation is not the only part of the Swedish social insurance system that is pension qualifying. We have chosen to study only the costs of sickness insurance, but if one includes for example childcare years and unemployment, the pressure on the pension system is even larger.

7.3 Sickness and activity compensation – the villain of the piece

As illustrated in the analysis, even though sickness benefits and rehabilitation allowance is costly for the pension system, the SAC is still a more alarming problem. The reasons are many. First, the recipients of SAC are more numerous. In December 2004, the recipients of SAC were 539 642 compared to 244 640 receiving sickness benefit or rehabilitation allowance. Second, and more alarming, the SAC is very permanent. The lion's share of the recipients never re-enter the labour market, but stays in the system until they reach old age pension age. This character of the benefit implies enormous pension entitlements for the state, as shown in the long run analysis.⁸⁶ A third reason is the fact that the inflow to SAC is large and increasing. Not least, a large number of people has gone from sickness benefit to SAC. A

⁸⁵ Försäkringskassan, 2005:8, Gudrun Ehnsson (Interview)

⁸⁶ RFV, 2004-09-17

fourth factor is the large and increasing number of young recipients in the SAC, considering the permanency of the benefit.⁸⁷

7.4 The link - and the alternative

In our analysis, we visualised the link between the sickness insurance system and the pension system. This link is the reason why a large number of people on sick leave troubles the well functioning of the pension system. If the sickness benefit or the SAC had not been pension qualifying there would not have been any link between the two systems. The functioning of the pension system would have been disconnected from the sickness insurance system. Or would it really? Let's consider a situation where there was no link. In this case, a large number of people receiving benefits from the sickness insurance would not have worked enough to get a sufficient earnings-related pension. This means that when reaching old age, they would depend on the guarantee pension, which is also part of the pension system, and tax financed. If one connects this to a life cycle perspective this implies that tomorrow's taxpayers would have to finance today's sick people who would be tomorrow's guarantee pensioners. The burden on the pension system would not disappear, but be transferred to future generations. In this perspective, the present solution might seem like a more reasonable alternative. Even though the cost is high, at least it is born by the same generation creating it.

7.5 Demand for insurance

So, the amount of money that the Swedish government contributes to the pension system for the recipients of benefits from the sickness insurance is immense. But, as stated in the theoretical section, most people are risk averse and demand an insurance protecting them from unexpected income losses. The risk aversion makes people willing to contribute part of their income to secure the rest of it with certainty, in case of for example ill health. If the government would make the sickness insurance system less generous to reduce the burden on the taxpayers, for example by making the sickness benefit not pension qualifying, part of the protective function would disappear. Considering people's risk aversion and the difficulties in establishing private sickness insurances, it is not certain this solution is desirable.

⁸⁷ Försäkringskassan, 2005-08-02

7.6 Possible solutions?

In this thesis we have pointed out that the large number of people on sick leave implies a heavy burden on the Swedish state and on the pension system. Even though the pension system stays on its feet because the state makes the contributions for the people on sick leave, it is important to remember that the state is not an ever-ceasing stock of financial resources. The money that the state can disburse are made up of the citizen's tax payments. If tax money are taken to make pension contributions for people on sick leave, this can lead to a larger tax pressure for present and future generations. To decrease the costs and secure the functioning of the welfare state, more people must come back on the labour market. But how?

There is probably not one single solution, but a number of actions must be taken in order to decrease the sick leave. The sickness insurance is connected with problems of moral hazard, indicating that some people excessively takes advantage of the system. Another possible problem are the shifting norms, leading to a wider spectrum of socially accepted reasons for sick leave. Even though people are risk averse, and demand a certain protection in the sickness insurance, they are also sensitive to changes in the system. This implies that reforms giving stronger economic incentives to work, such as the number of waiting days and the level of benefit might have a positive impact. But, as discussed earlier, the balance between benefits and co-insurance is tricky.

The other way of dealing with excessive use of the sickness insurance is through stricter monitoring. Closer follow-up, stricter rules concerning the doctor's certificate and home calls are some examples. This is not least true for the SAC. One of the reasons behind the reform of disability pension into sickness and activity compensation was to make them less permanent. The benefits shall be given for a maximum of three years. After that the Social Insurance Agency shall review the recipient's working capacity to see if there is any chance she or he might return to the labour market to some extent. It is highly important that these reviews are thorough and that the Social Insurance Agency does not just put a new stamp on the recipient's certificate every three years granting another period of SAC benefits.

Another strategy incorporates the other actors, part from the Social Insurance Agency. Through closer cooperation between the Social Insurance Agency, the doctors and the employers, some cases of sick leave could most certainly be avoided. A complementary option would also be to spread part of the costs of sick leave to these actors. Excessive use of

the sickness insurance could be decreased if the doctors had stronger economic incentives to suggest alternatives to sick leave such as rehabilitation or employment training or if the employers had stronger economic incentives to improve the working environment. A more flexible labour market is also important, as sick leave can be an expression for discomfort with the current employment.

8. References

8.1 Literature

Andersson a.o., 2004, "*Fakta om Sveriges Ekonomi 2004*", Svenskt Näringsliv, Stockholm.

Commission of the European Community, 2002, "*Joint Report by the Commission and the Council on Adequate and Sustainable Pensions*", European Commission, Brussels.

Connolly, S. & Munro, A., 1999, "*Economics of the Public Sector*", Pearson Education Limited, Essex.

Edgerton, D., Kruse, A., Wells, C., 2000, "*Designing an optimal sickness insurance. Some evidence from the Swedish experience*", Department of Economics, Lund University, Lund.

Försäkringskassan, 2003 a, "*Försäkringskassan informerar – Sjukförsäkring*", Riksförsäkringsverket, Stockholm.

Försäkringskassan, 2003b, "*Your whole life counts*", Försäkringskassan, Stockholm.

Försäkringskassan, 2004, "*Försäkringskassan informerar – Sjukersättning*", Riksförsäkringsverket, Stockholm.

Försäkringskassan, 2005, "*Pensionssystemets årsredovisning 2004*", Försäkringskassan, Stockholm.

Henrekson, M. & Persson, M., 2003, "*The effects on sick leave of changes in the sickness insurance system*", Seminar Paper No 697, Institute for International Economic Studies, Stockholm University, Stockholm.

Hogstedt, C. a.o., 2004, "*Den höga sjukfrånvaron – sanning och konsekvens*", Statens Folkhälsoinstitut, Stockholm.

Johansson, P. & Palme, M., 2002, "*Assessing the Effect of a Compulsory Sickness Insurance on Worker Absenteeism*", Journal of Human Resources, 37, University of Wisconsin Press, Wisconsin.

Konsumenternas Försäkringsbyrå, 2001, "*Ordlista för ålderspension*", Konsumenternas Försäkringsbyrå, Stockholm.

Kruse, A., 2002, "*Försörjningen på ålderdomen*", Department of Economics, Lund University, Lund.

Nicholson, W., 2002, "*Microeconomic theory, basic principles and extensions*", Thomson Learning, USA

OECD (Organisation for Economic Cooperation and Development), 2003, "*Ageing and Employment Policies, Sweden*", OECD Publications, Paris.

RFV, 2001, "*Ålderspension för personer födda 1938 eller senare. Del 1 - Att tjäna in pension. Vägledning 2001:11*", Pensionsavdelningen, Riksförsäkringsverket, Stockholm.

RFV, 2002, "*RFV Analyserar 2002:16 - Sjukskrivnas syn på hälsa och arbete*", Riksförsäkringsverket, Stockholm.

RFV/Socialdepartementet, 2003a, "*Den svenska ålderspensionen*", Regeringskansliet, Socialdepartementet, Riksförsäkringsverket, Stockholm.

RFV/Socialdepartementet, 2003b, "*The Swedish National Pension System*", Regeringskansliet, Socialdepartementet, Riksförsäkringsverket, Stockholm.

RFV, 2004a, "*Pensionssystemets årsredovisning 2003*", Riksförsäkringsverket, Stockholm.

RFV, 2004b, "*Social Insurance in Sweden 2004*", Riksförsäkringsverket, Stockholm.

Rikner, K., 2002, "*Sickness Insurance: Design and Behaviour*", Lund Economic Studies 103, Lund.

Swedenborg, B. (red.), 2003, "*Varför är svenskarna så sjuka?*", SNS Förlag, Stockholm.

Söderström, L., 1996, "*The idea of social protection*", Working Papers no 1996:1, Department of Economics, University of Gothenburg, Gothenburg.

8.2 Websites

www.forsakringskassan.se/sprak/eng/, 2005-08-30

www.forsakringskassan.se/omfk/analys/sjukformaner/, 2005-08-30

www.forsakringskassan.se/pdf-broschyr/faktablad/rehab.pdf, 2005-08-30

www.forsakringskassan.se/privatpers/sjuk/lange/aktivitetsers/, 2005-09-01

www.rixlex.riksdagen.se, 2005-08-31 (Lag (1998:674) om inkomstgrundad ålderspension)

www.scb.se/templates/Product_7820.asp, 2005-09-01

www.slf.se/upload/5641/sjukers.pdf, 2005-08-31

http://statistik.forsakringskassan.se/portal/page?_pageid=47,45735&_dad=portal&_schema=PORTAL, 2005-09-01

http://statistik.forsakringskassan.se/portal/page?_pageid=47,46541&_dad=portal&_schema=PORTAL, 2005-09-01

8.3 Newspaper articles/Press releases

Hedborg, A., "*Trötta sjukskriver sig*", Dagens Nyheter, 2004-09-17

RFV, "*Sjukskrivningar minskar, förtidspensioner ökar*", 2004-08-19

RFV, "*Långtidssjukskrivningarna minskar - många går över till sjukersättning*", 2004-09-17

Försäkringskassan, "*Sammantagna utgifter för ohälsan minskar med 2 miljarder nästa år*", 2005-08-02

Försäkringskassan, "*Sjukfrånvaron sjunker ytterligare*", 2005-08-19

Arbetsmarknadsstyrelsen, "*Arbetslivsfakta nr 2, 2004*", 2004-06

8.4 Interviews

Guðrun Ehnsson, Department for Evaluation, Head Office of the Swedish Social Insurance Agency, Stockholm, 2005-08-22

Staffan Kahn, Department for Evaluation, Head Office of the Swedish Social Insurance Agency, Stockholm, 2005-04-28

Göran Rehnby, Department for Old Age Pension, Head Office of the Swedish Social Insurance Agency, Stockholm, 2005-08-30

Kent-Rune Sjöholm, Department for Evaluation, Head Office of the Swedish Social Insurance Agency, Stockholm, 2005-06-01

Katarina Svärd, Department for Sickness and Activity Compensation, Head Office of the Swedish Social Insurance Agency, Stockholm, 2005-08-30

Joakim Söderberg, Department for Evaluation, Head Office of the Swedish Social Insurance Agency, Stockholm, 2005-08-22

Appendix A

Calculations concerning the number of recipients in the model. Data from december 2004.

Age-groups	All individuals	Number of Individuals with income related benefit	Number of Individuals with guaranteed benefit	Number of Individuals with guaranteed benefit only
16 – 19	2 937	7	2 937	2 930
20 – 24	8 950	768	8 712	8 182
25 – 29	10 449	3 178	8 829	7 271
30 – 34	16 309	10 532	12 563	5 777
35 – 39	29 229	24 205	20 378	5 024
40 – 44	42 681	37 363	29 283	5 318
45 – 49	57 990	52 271	38 880	5 719
50 – 54	81 658	75 144	52 776	6 514
55 – 59	127 715	120 609	76 754	7 106
60 – 65	161 724	155 017	89 039	6 707
All individuals	539 642	479 094	340 151	60 548

Table A1 The number of individuals receiving the SAC. Joakim Söderberg (Interview).

Age groups	All individuals	1/1	3/4	2/3	1/2	1/4
16 - 19	2 937	2 928	-	-	6	3
20 - 24	8 950	8 565	33	-	242	110
25 - 29	10 449	9 149	122	-	832	346
30 - 34	16 309	12 796	329	-	2 274	910
35 - 39	29 229	21 414	782	8	5 143	1 882
40 - 44	42 681	30 393	1 291	20	8 125	2 852
45 - 49	57 990	40 954	1 674	56	11 363	3 943
50 - 54	81 658	57 737	2 306	114	16 063	5 438
55 - 59	127 715	91 401	3 639	195	24 556	7 924
60 - 65	161 724	123 969	4 045	295	26 151	7 264
All individuals	539 642	399 306	14221	688	94 755	30 672

Table A2 The distribution of the total number of SAC recipients.

http://statistik.forsakringskassan.se/portal/page?_pageid=47,46541&_dad=portal&_schema=PORTAL

Age groups	All individuals	1/1	3/4	2/3	1/2	1/4
16 - 19	2 937	99,7%	0,0%	0,0%	0,2%	0,1%
20 - 24	8 950	95,7%	0,4%	0,0%	2,7%	1,2%
25 - 29	10 449	87,6%	1,2%	0,0%	8,0%	3,3%
30 - 34	16 309	78,5%	2,0%	0,0%	13,9%	5,6%
35 - 39	29 229	73,3%	2,7%	0,0%	17,6%	6,4%
40 - 44	42 681	71,2%	3,0%	0,0%	19,0%	6,7%
45 - 49	57 990	70,6%	2,9%	0,1%	19,6%	6,8%
50 - 54	81 658	70,7%	2,8%	0,1%	19,7%	6,7%
55 - 59	127 715	71,6%	2,8%	0,2%	19,2%	6,2%
60 - 65	161 724	76,7%	2,5%	0,2%	16,2%	4,5%
All individuals	539 642	74,0%	2,6%	0,1%	17,6%	5,7%

Table A3 The shares of the total number of recipients SAC

Age groups	All individuals	1/1	3/4	2/3	1/2	1/4
16 - 19	7	7	0	0	0	0
20 - 24	768	735	3	0	21	9
25 - 29	3 178	2 783	37	0	253	105
30 - 34	10 532	8 263	212	0	1 469	588
35 - 39	24 205	17 733	648	7	4 259	1 559
40 - 44	37 363	26 606	1 130	18	7 113	2 497
45 - 49	52 271	36 915	1 509	50	10 242	3 554
50 - 54	75 144	53 131	2 122	105	14 782	5 004
55 - 59	120 609	86 315	3 437	184	23 190	7 483
60 - 65	155 017	118 828	3 877	283	25 066	6 963
All individuals	479 094	351 317	12 975	646	86 394	27 762

Table A4 Approximation of the distribution of recipients with different income related benefits levels.

Age groups	All individuals	1/1	3/4	2/3	1/2	1/4	Total
16 - 19	7	7	0	0	0	0	7
20 - 24	768	735	2	0	10	2	750
25 - 29	3 178	2 783	28	0	127	26	2 963
30 - 34	10 532	8 263	159	0	734	147	9 304
35 - 39	24 205	17 733	486	4	2 130	390	20 743
40 - 44	37 363	26 606	848	12	3 556	624	31 646
45 - 49	52 271	36 915	1 132	34	5 121	889	44 090
50 - 54	75 144	53 131	1 592	70	7 391	1 251	63 435
55 - 59	120 609	86 315	2 577	123	11 595	1 871	102 481
60 - 65	155 017	118 828	2 908	189	12 533	1 741	136 198
All individuals	351 317	351 317	9 731	431	43 197	6 940	411 616

Table A5 Approximation of the accumulated number of individuals receiving the full SAC.

Appendix B

SAC benefit levels and age specific death rates.

Age groups	Average monthly assumed incomes (Women)	Average monthly assumed incomes (Men)	Average monthly assumed incomes (women and men)	Average monthly assumed incomes (women and men)	Average yearly assumed income (women and men)
16–19	7 423	7 445	7 434	11 616	139 388
20–24	6 955	7 133	7 044	11 006	132 075
25–29	7 080	7 544	7 312	11 425	137 100
30–34	7 235	7 809	7 522	11 753	141 038
35–39	7 366	8 209	7 788	12 169	146 025
40–44	7 367	8 368	7 868	12 294	147 525
45–49	7 483	8 587	8 035	12 555	150 656
50–54	7 632	8 865	8 249	12 889	154 669
55–59	7 870	9 390	8 630	13 484	161 813
60–64	8 123	9 996	9 060	14 156	169 875
Total	7 453	8 335	7 894	12 334	148 013

Table B1 Age specific average benefits and assumed incomes. RFV, 2004

Age groups	Total number of recipients	Number of recipients in each cohort ⁸⁸
16–19	7	1,7
20–24	750	150,0
25–29	2 963	592,7
30–34	9 304	1 860,8
35–39	20 743	4 148,5
40–44	31 646	6 329,2
45–49	44 090	8 818,0
50–54	63 435	12 686,9
55–59	102 481	20 496,3
60–64	136 198	27 239,6
Total	411 616	

Table B2 The total number of recipients, recipients per cohort.

⁸⁸ It has not been possible to find a complete distribution of the number of individuals that receive the SAC. Each age group has therefore been divided in to five equally large cohorts.

Age	Men	Women	All individuals
16 ⁸⁹	0,00686	0,001525	0,0041925
17	0,00686	0,001525	0,0041925
18	0,000448	0,001728	0,001088
19	0,00036	0,000385	0,0003725
20	0,000616	0,001496	0,001056
21	0,001058	0,001444	0,001251
22	0,001715	0,001704	0,0017095
23	0,000652	0,000814	0,000733
24	0,001179	0,000759	0,000969
25	0,00093	0,000754	0,000842
26	0,000823	0,000958	0,0008905
27	0,001606	0,000249	0,0009275
28	0,000887	0,0011	0,0009935
29	0,000729	0,000501	0,000615
30	0,001128	0,001223	0,0011755
31	0,001038	0,000315	0,0006765
32	0,000968	0,000727	0,0008475
33	0,000978	0,000977	0,0009775
34	0,001311	0,000434	0,0008725
35	0,001195	0,000334	0,0007645
36	0,001165	0,000474	0,0008195
37	0,001541	0,000681	0,001111
38	0,000966	0,000552	0,000759
39	0,001523	0,000893	0,001208
40	0,002042	0,000602	0,001322
41	0,001465	0,001039	0,001252
42	0,001943	0,000653	0,001298
43	0,001819	0,000746	0,0012825
44	0,00212	0,000785	0,0014525
45	0,001886	0,000705	0,0012955
46	0,001977	0,001043	0,00151
47	0,00169	0,000867	0,0012785
48	0,000831	0,000875	0,000853
49	0,002129	0,001069	0,001599
50	0,002846	0,001107	0,0019765
51	0,002695	0,001404	0,0020495
52	0,002467	0,00138	0,0019235
53	0,003145	0,001094	0,0021195
54	0,003184	0,001456	0,00232
55	0,003398	0,001416	0,002407
56	0,003403	0,001381	0,002392
57	0,003676	0,001715	0,0026955
58	0,003865	0,001692	0,0027785
59	0,003794	0,001925	0,0028595
60	0,003935	0,001938	0,0029365
61	0,003986	0,001946	0,002966
62	0,004517	0,002011	0,003264
63	0,004123	0,00194	0,0030315
64	0,004873	0,002202	0,0035375

Table B3 Age-specific death rates, Kent-Rune Sjöholm (Interview)

⁸⁹ The death rates of individuals aged 16 has not been available. It has therefore been assumed that the individuals aged 16 will face the same death rate as individuals aged 17.

Appendix C

Overview over the model and explanations concerning the calculations.

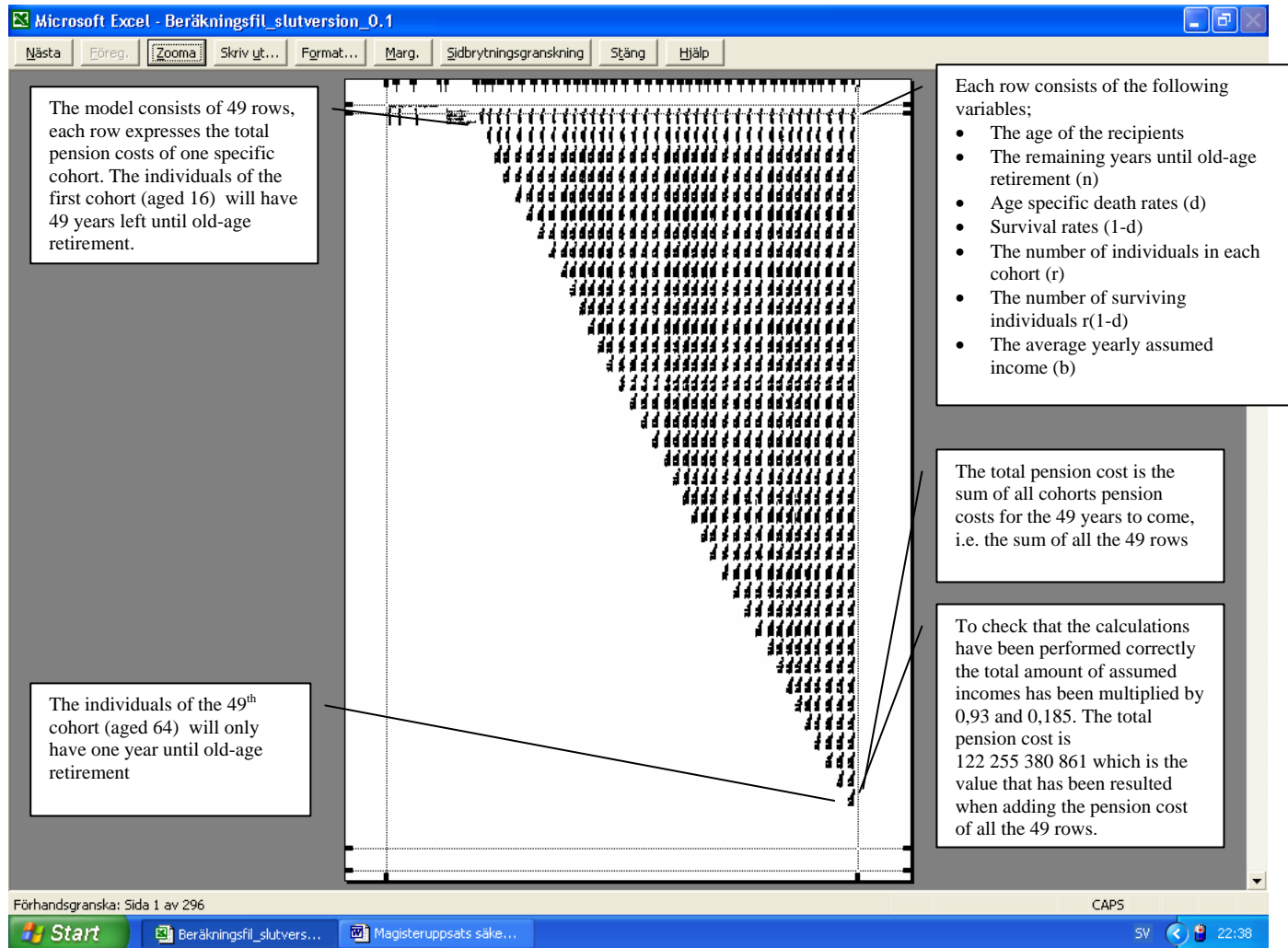


Table C1 Overview of the model

Age	16	17	18	19	20
Remaining until old-age retirement, (n)	49	48	47	46	45
Death rate, (d)	0,0041925	0,0041925	0,001088	0,0003725	0,001056
Survival rate, (1-d)	0,9958075	0,9958075	0,998912	0,9996275	0,998944
Number of individuals in each cohort, (r)	1,74687	1,73955	1,73225	1,73037	1,72973
Number of surviving individuals , $r(1-d)$	1,73955	1,73225	1,73037	1,72973	1,72790
Average yearly assumed income, (b)	139 388	139 388	139 388	139 388	132 075
Total amount of assumed income for the whole cohort	242 471	241 455	241 192	241 102	228 212
Total cost of pension for the whole cohort	41 717	41 542	41 497	41 482	39 264

Table C2 The pension costs of “Cohort 1”, aged 16 .

“Cohort 1” consists of about 1,75 individuals, aged 16. These individuals will have 49 until their old-age retirement at 65 . The age specific death rate of the this cohort, year 1, is about 0,004 percent, meaning that the number of recipients will decrease to about 1,74 individuals the first

year. The average yearly assumed income, 139 388 SEK has been multiplied by the number of surviving individuals. The assumed income for year one is 242 471 SEK for the whole cohort. The pension cost is calculated from 93 percent times 18.5 percent of the assumed income. In year one, the total cost of pensions will be about 41 717 SEK. This calculation is repeated 49 more times until individuals of the cohort reaches the age of 65. The total pension cost of this cohort is thus the accumulated sum of the yearly pension costs. The total cost of pensions is the accumulated sum of all the 49 cohorts' total pension costs.