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An analysis of future benefits from public and private pension schemes

The Norwegian country study to the OECD pension adequacy project

Fafo

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Preface

The recent reform of the Norwegian national pensions system and the growing role of occupational pension schemes make it increasingly important to understand the impact this will have on future pensions. This report offers an analysis of replacement rates in Norway, i.e. income levels in old age among future Norwegian pensioners. It asks a quite simple but technically advanced question: Are people saving enough for their retirement?

The report is commissioned by the Norwegian Ministry of Labour and Social Affairs. The analysis is conducted by The Fafo Research Foundation at its Institute for Labour and Social Research in cooperation with actuaries from Lillevold & Partners, a group of actuaries specialized in modeling and calculating the accrual of pension rights. Pål Lillevold and Hans Gunnar Vøien at Lillevold & Partners have developed specific pension models in order to calculate and estimate all elements of individual pension accruals in Norway in both public and private pension arrangements. These calculations are conducted through the use of registered historical income data and estimates of future income as inputs to the actuarial models for each relevant pension scheme. Fafo and Lillevold & Partners together developed the methods and design used in this report and conducted the calculations in close cooperation.

This study serves as an input from Norway to the OECD project on retirement savings adequacy. The Norwegian research team has worked closely together with OECD representatives in order to provide calculations as consistent as possible with the OECD requirements. While many other OECD country studies are based on survey data, this Norwegian analysis is based on register data of both income and labour market positions. This approach offers greater opportunities for precise estimates of pension income. However, this approach has some limitations, in particular that the Norwegian data is individual and not household based. Nevertheless, this is the first time that all public and private elements in the overall Norwegian pension system are estimated through actual individual historical and prospected future income data.

We would like to thank Stéphanie Payet from the OECD and Arne Magnus Christensen from the Norwegian Ministry of Labour and Social Affairs for very useful comments.

Jon M. Hippe

Project leader,

April 2014

Chapter 1 Introduction – pension readiness in Norway

This study of Norwegian pension readiness is a part of a larger ongoing comparative OECD study which seeks to compare the proportion of people prepared for retirement across countries. The OECD-project - the OECD Retirement Savings Adequacy study - has as its ambition to model the retirement readiness of people currently of working age (OECD May 2013). The common method in the country specific studies is to measure what people have already accumulated in both actual pension assets as well as in pensions rights (pay as you go or partly funded) and then to complement these already collected pension rights and assets with what people may accumulate from now on and until the day they retire. The calculations will build on many different assumptions or scenarios regarding what may actually happen during this period as well as on their actual pension behavior. In order to estimate future income, several factors need to be taken into account, such as the regulation of pension rights, links to wage growth or inflation (discount rate), return on capital as well as retirement age.

In this Norwegian analysis we have access to register based data of the Norwegian population in their working age with information on historical income as well as their labour market position. We have constructed models of pension accumulation in the different schemes and combination of schemes available to individuals in Norway. By knowing where people work, if a company is covered by a collective wage agreement and combining this with historical income information as well as estimates of future income developments, one can conduct relatively precise estimates of pension accrual. In this way, and following as far as possible the OECD requirements, the ambition of this study is to estimate the future pension conditions for the present Norwegian working population.

In order to gain better insight into future pension conditions we will look at pensions levels (defined as retirement replacement rates) across labour market groups, social economic groups, gender and other variables useful to understand differences in pension rights. We intend to identify the actual income levels different groups will have as retirees.

In a Norwegian setting the assumption of a future retirement age becomes of significant because there is a flexible pension age between 62 and 75 years. Decisions of withdrawal from the labour market become one of the most important variables in our attempts to estimate actual future pension payments.

Moreover, this study will specifically estimate the risk of having low pension income levels among some groups of retirees, hence trying to provide an answer to the question stated in the title of the OECD-project: Are retirement savings adequate? Or, quite simply, are retirement savings good enough?

The importance of this study in a Norwegian context is twofold. First, we have actual income data that allows us to go a step further than traditional pension calculations based on ideal-type scenarios or the less reliable self-reported survey based information on pension rights and income. Second we have information by sector, industry and coverage by collective agreements,

which provide the possibility to construct an analysis based on pension schemes actually found in different sectors and industries.

Taken together this study offers a possibility to model the private-public mix of pensions combining accrual in the national pension system with various occupational and other arrangements in the labour market. In other words, we have set out to give a comprehensive overview of the nature of public private pension mix and the actual pension accruals following from this public-private division of work in the overall pension system.

In a Norwegian setting the political relevance of this analysis is high. It will serve as a contribution to the efforts of evaluating the pension reform. In addition, it has relevance for the developments of future strategies adopted by individual employers and employees as well as the labour market actors responsible for private pension schemes trough collective bargaining and voluntary employer action.

The timing of this analysis is vital since the important elements of the pension reform have been implemented and a flexible pension age has already taken effect from 2011.Occupational and contractual schemes have gained in importance through collective agreements on pensions in 2008 and through the introduction in 2006 of a statutory minimum savings level of 2% of yearly wage in occupational pensions. One of the most relevant research questions posed in this study is therefore, what will be the impacts of these new elements?

The report is divided into the following chapters:

Chapter 2 gives a brief description of the main elements of the Norwegian pensions system in order to give international readers an overview of the system and hence a background for the interpretation of the calculations presented in the report.

Chapter 3 provides a methodological overview. The purpose of this chapter is to discuss in more detail the data used and identify the key assumptions made.

Chapter 4 is intended to give the broader picture of future pension conditions in Norway. We start out by offering an analysis of the structure of pension accrual asking who are covered by what kind of pension package. As a next step we calculate replacement rates when retiring at 67 years. The chapter also offers an analysis of payment profiles when life long and terminating pension payments are combines in order to show the actual pension payment profiles.

Chapter 5 takes the analysis a step further and gives a more detailed insight into variations in replacement rates. Keeping the retirement age assumption constant at 67, the chapter focuses on differences between sectors, industries and socio economic groups. Moreover, the chapter discusses the variation in replacement rates between different age groups. This is done in order to show the effect on pension payments from increased life expectancy and the tendency in many pension arrangements to shift the corresponding financial risk to the individual.

In chapter 6 we let go of the simplified assumption that everyone will retire at 67 and focus on the possible effects of varying scenarios of pension withdrawal. The chapter offers calculations of replacements rates at labour market exit 62, 67 and 70 years. As a part of these estimations the chapter gives comparisons between the public and private sectors, industries and across socio economic groups.

In chapter 7 we examine more closely the distributional logic of future pension income. First, the chapter presents calculations of the GINI index and other measures of retirement income

distribution. Thereafter, we provide measures of the proportion of possible retirees that risk having a pension income below various levels of low pension income.

In chapter 8 we discuss briefly other relevant aspects of future pension income. First we illustrate the effect of different return on occupational pension capital which is especially relevant in defined contribution schemes. Second, we show some illustrations of pre- and post-taxation effects on replacement rates. Third, we look into the importance of individual pension savings in Norway. And last, we examine other sources of income in old age such as home ownership and other wealth objects.

Chapter 9 sums up the major findings from this analysis of the distribution of pension levels in the mixed Norwegian pension regime. The chapter concludes by some remarks on the future challenges for Norwegian pension policy and points to some difficulties facing the labour market partners taking part in discussions, disputes and negotiations over labour market and occupational pension schemes in Norway.

Chapter 2 Main elements in the Norwegian pensions system

Norway has, together with Sweden, developed a Nordic style pension system combining a Beveridge-inspired universal minimum security for all citizens with a Bismarckian income related insurance pension scheme for all wage earners in its national state run pension system. The Norwegian pension system combines, however, a state-based national pension program with a range of private occupational schemes and collectively negotiated pension schemes.

The public national pension program (named "Peoples Pension" [People's Social Security] [National Insurance] or "Folketrygd" in Norwegian) is a pay as you go financed system and provides a mutual basis for pension accrual for all Norwegians (people with registered income in Norway). Due to a somewhat limited generosity in the actual pensions accrual rules and, more important, an income ceiling on pension accrual around 20-25% over average full time income (7.1 base amounts – 605 240 NOK pr January 2014) there is significant space left for private market-based pension supplements in Norway.

These private supplements are mainly to be found as occupational pension schemes at company level or through negotiated schemes available to those covered by collective agreements. As in most European countries, private pension schemes in Norway include favorable tax treatment through the postponement of income tax. According to Norwegian regulations, an occupational scheme should cover all employees in a company meaning the all employees must be covered by the same pension plan. This should secure an equal pension accrual relative to income, i.e. if all employees are aiming at 66% of final income, one accept that the pensions premiums will vary significantly between employees.

In addition to the traditional occupational schemes there is also a centrally negotiated pension arrangement in those companies covered by collective agreements, which we address in more detail below.

Individual pension savings have a very limited role in the overall Norwegian pension system. Only around 10% of all individuals have a separate individual pension savings account. There are, however, a large number of individual accounts that people carry as a result of previous membership in company-based occupational schemes.

2.1 The national pensions system – peoples pension

As the Swedes did ten years earlier, Norway took on the politically challenging task of reforming the national state pension system, implementing a pension reform in 2011. The new Norwegian pensions system, is based on yearly accrual of 18.1% of pensionable income. This is collected as a pension right into an individual pension account held by the state which is regulated yearly following the general wage increase in society. It should be underlined that this is

not an actual capital based account, but a nominal, or virtual, account for each individual guaranteed by the state. Yearly regulation according to the general wage increase is politically decided in a parliamentary decision each year through what is called a base amount (or G in Norwegian). The base amount (G) serves different purposes in the pension system, of which one important task is to secure the value of the notional pension account relative to the wage growth in the economy. G is also used for indexation purposes by some private arrangements.

It should also be noted that the actual contributions paid from employers is independent of the accrual rate of 18.1%. In addition there is no income ceiling for contributions allowing for redistributive effects.

Pensions can be withdrawn from the age of 62 years independently of a person working or not. Hence, there is a full flexibility to combine work and pension (fully or partly). Additional income after 62 and until 75 years will generate new pension accrual.

When pensions are paid out, the average expected life length of your age cohorts serves as the bases for calculating yearly pension payments. In this way the economic risk when life expectancy in the population increases is placed on each individual and not on future tax payers. Pensions that are paid out will be regulated by G but reduced by a fixed factor of 0.75%, i.e. if wages increase by 3.5% pensions are regulated up by 2.75% the same year. In other words, the Norwegian pension reform consists of well-known elements, found in many European pension reforms the last decade, which attempt to reduce future costs of pensions to society through a transferring of economic risks to individuals.

It should be taken into consideration that for the oldest age cohort, born before 1963, the old accrual system is fully (for those born before 1953) or partly in place. The old system was based on the 20 best income years after 40 years of membership (income more than one base amount). The pension age was fixed at 67 year and the income ceiling was somewhat different (full income to 6G and 1/3 of income between 6 and 12G). The most important differences compared to the new system are the shorter accrual period (versus yearly and continued accrual in the new system), a full guarantee even if life expectancy in your age cohort increases, and a fixed pension age at 67.

Before adjusting for future increases in life expectancy, a normal work career at average income will, broadly speaking, offer a replacement rate in the national system around 50-55% of previous income before tax at 67.

2.2 Private pensions in Norway

In addition to the accrual taking place in the old and new national pension system there is a unique Norwegian blend of voluntary occupational and negotiated labour market based schemes providing additional build-up of pension capital and pension rights. In a discussion of occupational pensions in the Norwegian setting, it is useful to distinguish between the public and private sector programs. This is due to the distinct differences between the two sectors of the economy (also) when it comes to pensions.

Private sector occupational arrangements

In private sector, the number of employees covered by occupation old age pensions has long been in minority. In most of the post war period 30-40 percent of private employees had pension coverage (Hippe and Pedersen 1992, Hippe et al. 2007). Typically this consisted of benefit schemes (DB) aiming at 66% of final salary including an estimated state pension.

With the coverage rate of occupational pensions stable and very limited, a political debate over this lack of pension coverage arose during the late 1980s. Trade unions in private sector were particularly vocal, in part due to an understanding that state pension levels would not be increased. Trade unions pursued their historical ambition of securing all wage earners two-thirds of previous income as pensioners through negotiating collective agreements. These attempts did, however, not succeed (with the important exception of a negotiated early retirement scheme between 62 and 67 years establish in 1988 and dismantled in 2009).

Through tri-partite cooperation employers and trade unions approached the government with the ambition of establishing a system based on a minimum statutory requirement for occupational pensions. Closely linked to the broad political debate regarding a future pension reform and the need to secure political support for such a reform, the government introduced a legislation of statutory occupational pensions in 2006. This gave employees a minimum of 2% of yearly wage in savings/contributions, provided first of all through defined contribution (DC) schemes with individual investment accounts.

DC schemes were given favorable tax treatment as early as in 2001, but coverage only increased up to 150 000 employees through voluntary employer decisions. After 2006, the statutory requirement fueled a new market for DC occupational pensions in Norway, which now cover more than one million private sector employees. Today the coverage of DB-schemes in private sector is down to around 300 000 employees. As a general rule, one can say that occupational pension schemes in Norway are not subject of collective agreements, but as based on voluntary schemes offered by employers (over the statutory minimum level).

Public sector occupational arrangements

In the public sector the traditional occupational schemes are basically still intact. The state as employers and public sector trade unions did not manage to agree on a full transformation of occupational schemes according to the new principles of the pension reform in their attempts to do so in the 2009 collective agreements. This shows also an important difference between public and private sector occupational arrangements, namely that occupational pensions in public sector are a part of collective agreements while this is, a the main rule, not the case in private sector.

Public sector occupational schemes cover all employees in both local and central governments through collective agreements and legal regulation (the latter for state employees only). Norway seems to be the only European country where all public sector employees actually are covered by the same uniform pensions plan offering an identical pension product based on full pension after 30 years of accrual at 66% of final wage at 67 years (Veland 2013). Because of some more technical elements actual replacement rates has been around 70%.

The state employee occupational schemes dates back to 1917 and were also offered to state blue collar workers during the 1950's. The local government arrangements were introduced first of all in the early post war period and collective agreements secured full coverage in the 1970's.

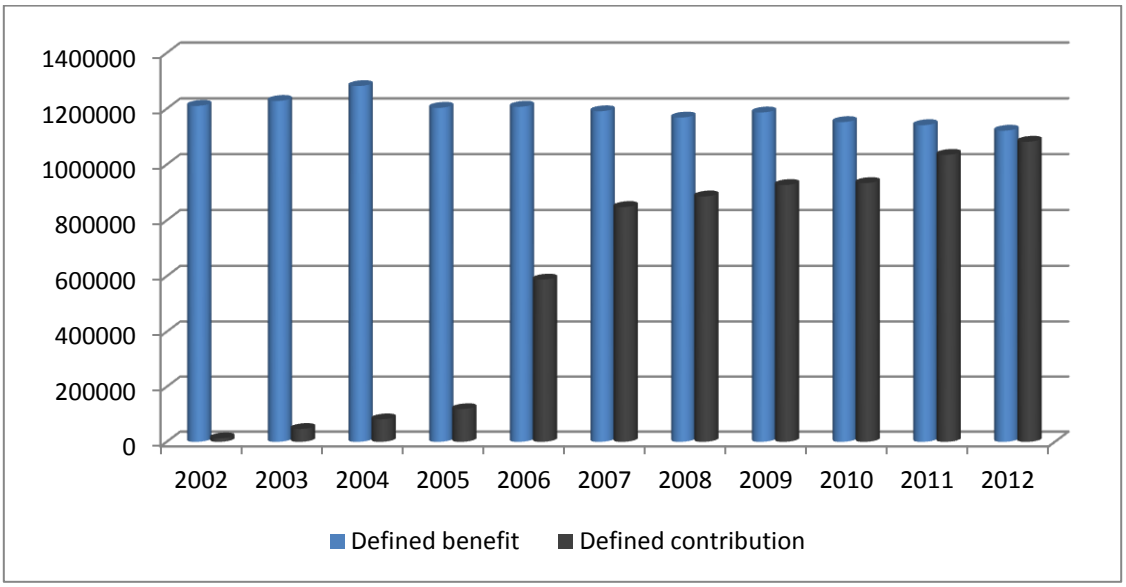
In more recent years an early retirement element has also been introduced securing a somewhat lower pension level from 62-65 years and a possibility of having full pensions at 65 if one has reached full pension accrual at this point. It is therefore correct to say that most public employees have the opportunity to retire earlier than at 67 years.

Furthermore, public occupational schemes are labelled "gross pension rights", indicating that there is a full guarantee including pensions from the national pension system. This means that the occupational scheme provides the promised total pension level independently of the national pension system. In private sector the occupational arrangements only aims at a certain pension levels and if national pensions payments are less than anticipated in the calculations this will affect the overall pension received.

In the already mentioned collective agreements in 2009 the parties did, however, agree to gradually introduce reduction of pension benefits if life expectancy increases. The reform protected the oldest age group from reduction. Nevertheless, younger public employees will see reduced pensions levels due to increased life expectancy (see chapter 3 for details).

It should be stressed that public sector programs may be subject to future changes. This will probably mean introducing some kind of hybrid scheme based on yearly accrual and average life income as bases for pension calculations. This will secure a better interplay between the national system and the public sector occupational programs giving also public sector employees the same possibilities as private sector employees to work longer with full pension accrual and to freely combine work and pensions. New negotiations are expected to take place no earlier than in 2017. For the time being discussion of the future system is only speculation and estimates in this analysis are based on the current rules and regulations for public sector employees.

Figure 2.1 Members of DC and DB occupational plans in Norway. 2002-2012. Public and private sector.



Source: Veland (2013)

2.3 Collectively negotiated labour market pensions (AFP)

In the final stage of the Norwegian pension reform the former negotiated early retirement system was transformed into a regular old age pension system offering supplementary benefits to the national pension scheme. As did the new state pension scheme, the labour market scheme named AFP became effective also from 2011. AFP (meaning literary "collectively agreed pensions" in Norwegian) was the result of a tri-partite agreement in 2008. The private sector employers organization (NHO) and the Confederation of trade unions (LO) agreed to establish the new system. The labour market parties received a state promise of government co-financing (1/3 of yearly cost) as well as administration of accrual and pensions payments by the state social security authorities (NAV). This was later made into a legal regulation by parliament.

The AFP scheme includes all employees working in private companies covered by a collective agreement. It should be noted that opposed to in the neighboring Nordic countries collective agreements are not wide spread in all industries in Norway and total private sector coverage is therefore only around 50%. There is no system of legal extension of collective bargained pensions as for example found in the Netherlands.

As found in the state system, pensions are paid out from 62. Pension withdrawal is voluntary and later withdrawal results in higher yearly pensions. Pension payment requires a membership at least 7 out of the last 9 years before 62 as well as the last three years prior to pension withdrawal. If this requirement is met, income (defined in the same way as in the state system) from the age of 13 years provides the bases for calculating pensions. Each year of income then provides a yearly pension promise of 0.314 percent of the individual income. This implies that with 450 000 NOK in yearly income one secures the right to a lifelong pension of 1 413 NOK a year. After 10 years (at same income level) the individual will have a lifelong pension payment of 14 130 NOK and after 40 years of 56 520 NOK with some fixed amounts in addition (see chapter 3).

AFP pensions are also subject to future reductions if life expectancy increases using the same mechanisms as found in the state system.

The unique feature of this system is that it is not fully funded and that an individual only will receive pensions if he or she is actually covered by the AFP-scheme at pension age. This creates a problem of "drop outs" that previously have been covered by the AFP scheme, but due to for example firm closings find themselves uncovered the last nine years before pension age. Along with the limited coverage these issues causes some debate on the future of the AFP-arrangements.

2.4 The public private mix

Taken together one can say that Norway has a unique national public private mix of pensions. First of all there is a significant difference between public and private sector. With a public sector employment of around 35% of total employment this is of great importance to the functioning of the overall pension system.

Secondly Norway has a multilevel pension system. The state national system constitutes the first level. Statutory occupational pensions offers a second tire and a collectively agreed scheme for private employees make up the last tier.

If we recalculate the AFP-benefit formula into the actual necessary yearly contributions necessary to achieve a typical benefit it would be around 3.5 to 4% of yearly wage. This is done for illustrative purposes in order for us to illustrate the level of typical yearly pension savings or contributions in private sector:

- National pension system: 18.1% of yearly income
- Labour market based AFP: 3.5 – 4% of yearly income
- DC occupational pensions 2 – 7% of yearly wage

Taken together yearly pensions savings in the new systems adds up 20% for those with the lowest levels of pensions accrual and to around 29% for those with the most generous savings levels. (In addition around 40% of all employees are covered by DB arrangements aiming at 66% of final wage and with individually varying pension premiums.)

One should also mention the individual pension saving plans open to the Norwegians. Included here are private pension arrangements such as Individual Pension Agreement (IPA) and Individual Pension Saving (IPS). These are however of very limited importance in the overall Norwegian pension system.

Chapter 3 Methodological framework

This chapter provides a description of the methodological design for the Norwegian study estimating future retirement savings adequacy. First we give an overview of the data sets used and of the main sample selections made. Thereafter we discuss the main assumptions made regarding coverage and benefit calculations for both public pay-as-you-go systems as well as for private pension arrangements. Lastly the chapter offers a discussion of the main indicators that will be used in the study.

Deviations from the methodological framework set by the OECD will also be discussed.

3.1 Description of the framework

The OECD has put forward a common framework for all countries analyzed in their project in order to model the retirement readiness of people currently of working age. Their goal is to compare the proportion of people prepared for retirement across countries by measuring what people have already accumulated in terms of pension rights and pension assets and to add what people may accumulate from now until the day they retire. The OECD framework is based on various assumptions concerning economic development as well three different ages of retirement.

In this Norwegian study we have access to data on historical income and we estimate future income through a model developed by the social security authorities in Norway (NAV). This model, named TRIM, takes actual income data up to present time as the basis for a system of matching identical individual (defined from a number of variables) born 10 years earlier. Many other country studies base their calculation on survey data for one year and they use different macro-economic indicators to estimate various income scenarios. In the Norwegian data set we have access to both actual income histories as well as prognoses of future income and we can do relatively precise estimates of pension accumulation during a working career. In order to calculate pension assets the analysis also applies assumptions of rate of return on assets and discount rates, as will be discussed later.

When it comes to pension age we have, in the Norwegian case, chosen to calculate replacements rates at three different possible future retirement ages. First we use the lowest possible age of retirement (62) as our "early" retirement age, then we use the former official retirement age at 67 years as an indicator of actual future retirement as well as 70 years in order to see the effect of possible longer working careers.

The Norwegian data set do not contain household level information. The data set is based on individual income information. This constitutes a difference compared to several other country studies conducted on household surveys.

The data set includes, as in the OECD framework, persons older than 35 years. Individuals who have already reached the Norwegian pension age at 62 are excluded from the sample. In addition the study only includes individuals with a working history, defined as registered in employment and with an average life income pr. year over one base amount (G). Individuals who are not employed and have no or very little income over their working career are therefore excluded. These groups will in Norway receive a guaranteed minimum pension of 2G (singles, married 1.85) if time of residence is 40 years.

The individual working and income history is used to calculate pension accrual and pension assets from both the public pay-as-you-go (PAYG) system, the labour market based pensions scheme (AFP) as well as from DB and DC pension plans. Individual pension savings are not taken into consideration.

Data set description

The study uses three administrative data sets. The Norwegian social security authorities named "The Norwegian Labour and Welfare Service" (NAV) have made available a data set that includes data on income since the age of 17. The data set contains the total population living in Norway in 2008. The study randomly selects 10% of the NAV sample by extracting people born the 5th, 15th and 25th day of each month.

The NAV data set is then merged with "The Employee and employment register" (NAVs AA-register) which includes information on individuals' employment situation in 2009, including information on sector code, industry code and firm organizational number. Precisely the firm organizational number provides an opportunity to merge individual information with a data set that provides employers' affiliation to the collectively negotiated labour market pension system (AFP) from the administrative organization, "Fellesordningen", running the AFP-scheme. What we have done is to use organizational numbers from "Fellesordningen" and we have merged these with the NAV AA-data set so that we can identify if a person is working in a company covered by collective agreements or not. The information on organizational number of companies covered by the AFP-scheme is from 2012. For the analyses in this report new formal consents have been given by the relevant authorities in order for us to reuse this data and, for the first time, to combine this data set with new information on coverage of collective agreements.

The combination of data sets has provided an interesting data set for the purpose of calculating future pension accrual in both public and private pension arrangements. This procedure of re-using a former data set was chosen to make the formal process of receiving data and formal acceptance as fast as possible. This causes a problem when income and employment information from 2008/9 is combined with employer status regarding collective agreements in 2012. Among other things, persons that have moved between the organized and non-organized sector in recent years will be treated as if their position in 2012 were the same in 2009. In our opinion this problem is not of significant importance. One should remember than we also assume that people stay in the same job for the rest of their working career and hence are covered by the same occupational schemes. Moreover, there is a group of individuals with an income history for whom it is not possible to identify the employer (including self-employed) are that we have

chosen to excluded from the sample.[1] We have however compared for example industry structure in our data set with other relevant data set and see no major differences.

In addition, to these more technical adjustments only individuals with an employment history that have an average yearly life income over 1G are included in the sample. Public transfer recipients (mostly disabled) have also been excluded. This is nearly 10% of the total sample.

As already noted the study then includes employed individuals aged between 35 and 61 years in 2013 (i.e. born between 1953 and 1978). Individuals, older than 61, are excluded as it is not possible to determine with the available data whether they have already retired or not. In Norway people can freely combine pension payments and work after 62 years which makes the fact that a person receives a pension a poor indicator of actual retirement. The analysis is done for individuals only. The administrative data sets do not permit the identification of people living in the same household.

Income and earnings going forward

In the NAV data set we have information on total income from all work related earnings that can be used for the accrual of pension rights in the national pension system. Hence, capital incomes are excluded. This total income definition is used not only in the national pension system (folketrygden) but also in the correspondingly AFP-scheme.

For pension accrual in occupational schemes (DC/DB) we have estimated wage earnings used to calculate occupational pension rights since we do not have information of actual wages from the employers offering membership in an occupational scheme. We have estimated this relevant pension accrual wage based on wage data from the national bureau of statistics (Statistics Norway) for each industry and in average found that direct wage included fixed wage supplements are around 14% less than total income from work in private sector and 5% less among public sector employees. See Hippe and Lillevold (2010) for a discussion.

As noted above, future income is projected based on a model developed by the Norwegian Labour and Welfare Service (NAV) called TRIM. TRIM bases its projections on observed patterns of retirement and evolution of income by a concept of matching. The employment and income data from identical matches person is used as an estimate of their prospected employment and income the next 10 years, i.e. the 1980 cohort have actual income from 17-30, while data from the 1970 cohort is used to estimate income between 31 and 39 years. This is done for all cohorts until they are 75 years.

Individuals are assumed to stay in employment until retirement and they are all given the estimate future income by the TRIM-model. The TRIM-model reproduces different employment trajectories such as disability or unemployment. For the purpose of this study the ambition is not to estimate the number of possible future disability pensioners, but to estimate future pensions when fulfilling a work career. For those individuals who are randomly identified as becoming disabled in the future, we have chosen to keep the average income of the three years prior to disability as their projected income. For the smaller number of persons that are mod-

[1] Around 10% of the initial sample has been excluded from the analysis due to the fact that it is not possible to identify the employer. This is due to the combination of different data sets leaving out a number of people because of technical problems or missing data on firm organizational number. This group also includes people with a short period of leave at the time of registration.

elled as unemployed for short periods or on pregnancy leave, these periods are excluded from pension accrual in occupational schemes.

It should be underlined that this study also assumes that employment with the current employer is continued until retirement implying that membership in an occupational scheme is held constant as well as coverage by labour market arrangements. In other words, even though future income is estimate based on structural changes in previous cohort's labour market careers, future occupational pension benefits is based on the simple assumption of a stable industry and company structure as well as a continuous level of collective agreements. This is obviously a simplification.

Age of retirement

The OECD framework uses three different assumptions to determine the relevant age of retirement. First, the individual retires as early as possible, corresponding to the minimum age of retirement of each country. Secondly, that the individual retire at the actual average age of retirement observed in the country analyzed. And last that the individual retires at the official or statutory age of retirement of each country. In case the actual average age of retirement is larger than the official age of retirement, the OECD framework assumes that the individual retires at the actual average age of retirement plus two years rather than assuming she/he retires at the official age of retirement.

In Norway, since the 2011 reform, there is a flexible age of retirement from the state pension between 62 and 75 years old.[2] People can freely combine pension and work (in such cases, they continue to accumulate pension rights on the part of their income collected from work). From the age of 70, employers can end working contracts. 70 is the age limit defined in the Work-life Environment Act (AML). Individuals can, however continue working and accumulating pension rights until the age of 75. In many companies, contracts are usually ended at age 67 due to accepted historical traditions (67 was the official age of retirement before the reform).

People cannot retire at 62 if their pension income is expected to be below the minimum pension. If so, people have to delay retirement and continue to build pension rights. From the age of 67, people can retire and get the minimum pension even if their own accumulated rights would have left them with a lower benefit.

Public sector workers can retire with a full pension after 30 years of contributions at age 67. They can also enter an early retirement scheme from 62 until 65 or 67. This early retirement pension equals the benefit level in the former national pension system at 67 years (around 50% replacement rate) with an additional fixed amount of NOK 20,400.

It should also be noted that actual pension age is rapidly increasing in Norway and is expected to increase even further as the new pension system comes into to full effect. Hence previous retirement behaviour offers little information on future retirement ages. And, as already pointed out, retrieving a pension does not mean that a person has to stop working. The Norwegian study has therefore chosen to use three different assumptions regarding retirement age:

[2] The reform had an immediate effect in the age of retirement, even for people for whom the pension calculation remains under the old rules (under the old rules, the official age of retirement was fixed at 67 years old).

- First we assume that people retire at 62 (or as early as possible as long as the expected pension income is below the minimum pension). This is the pessimistic scenario in the OECD guidelines.
- Second, we have chosen to use the former retirement age at 67 as an intermediate scenario.
- And last, we use 70 as an optimistic scenario since this is still the age where employers can let all employees go.

Taken together these three retirement ages will give a good indication of the effect of retirement behaviour on pension levels in to morrows labour market.

3.2 Pension coverage and pension calculations

The calculations of pension accrual in the analysis are based on information on coverage and accrual rules in both public and private pension schemes. For each individual, an actuarial model is designed for the purpose of estimating precise pension levels. In order to make pension payments comparable across various sub groups we have chosen to calculate all pensions as if they were lifelong yearly payments. This means that we estimate an accumulated total pension right and estimate the first year of payment as if payments are lifelong. In other word, pension paid out only to the age of 77 are recalculated into lifelong benefits.

Benefit projection from PAYG/public pension systems

Norway has introduced a new national pension system as a kind of notional DC system in 2011. Benefits are calculated as if there were a contribution of 18.1% of total income pr. year (Up to 7.1 G). Actual contributions paid from employees and employers are less. These yearly contributions, to a notional pension account, are regulated according to the general wage increase in the economy (base amount, "G"). Pensions can be withdrawn from the age of 62, with the possibility to combine pensions with work. Additional income from work from 62 to 75 years will generate new pension accrual. The average life expectancy of the retiring individual age cohort will be used to calculate actual yearly pensions at retirement. In our calculations we have used the official prognoses from NAV for life expectancy for future age cohorts (se under for a more detailed explanation).

Pensions paid out are regulated yearly based on G, reduced by a fixed factor of 0.75 percentage points.

The Notional DC system applies partially to people born between 1954 and 1962, fully to people born after 1962 and does not apply to people born before 1954. For this last group pensions are calculated according to the rules of the former system. This system had a universal basic pension and an earnings-related pension. The earnings related pension was based on the 20 best income years after 40 years of contributions (for people with an income above 1G). The official age of retirement was fixed at 67. Even though pensions are calculated according to old rules, pensions can be withdrawn from the age of 62 resulting in a reduction of yearly pension so that total pension payments do not exceed the level achieved if pensions where paid from 67 years.

An individual's pension account is accumulated though yearly contributions of 18.1% of income (up to 7.1 G). The account can be accrued from the years in which the individual's age

turns 13 until 75, or any age between these, At retirement the account is turned into a pension benefit by dividing it by a number called a "annuity divisor" ("delingstall" in Norwegian). The annuity divisor is a function of retirement age and birth year and basically reflects the expected remaining lifetime after retirement for an individual born in the specified year. Also the number includes a factor for the inheritance from individuals of the cohort who has died before reaching the retirement age and it takes into consideration that the benefit are going to be indexed less than the general wage increase (G). Actual national death statistics for the ten years prior to the year the individual turns 61 are used as basis for survival probabilities/calculation of expected remaining lifetime. The indexation of the state pension under payment is based on the increase in G, but is then reduced by 0.75%. Reduced indexation is also apparent for pension calculated from the former system. Here the life expectancy adjustment goes through a so-called "ratio number" ("forholdstall"), also dependent on retirement age and birth year. The benefit, as calculated from the old rules, is divided by the ratio number to produce the new benefit after life expectancy adjustment. At the old retirement age of 67 the ratio number is around 1.00[3], for lower retirement age it is higher than 1, and for retirement later than at 67 it is typically greater than 1. As with the "annuity divisor" the ratio number is settled at the year the members of the cohort turn 61.

Non-contributory pension benefits/minimum pensions

Norway had from the outset a system of minimum pension at 2 G for individuals and somewhat lower for married. In the new system there is a pension guarantee at 67 at the same level. This is 1.85 for married/cohabitants and 2 G for singles. This is due to expected higher expenditure level found in one person households. Over time the minimum guaranteed pension will also be reduced due to longer life expectancy (0.5% the coming years). This is taken into consideration in the calculations. In this study we have assumed an average minimum pension level of 1.85 G from the outset for persons where pension accrual is less than the minimum pension guarantee not knowing their household status.

The AFP labour market based scheme

The collectively negotiated labour market pension system (AFP) became effective from 2011 and covers around 50% of private sector employees. It is partially funded. Pensions are paid out from 62 with the same incentives to work longer as in the state pension system (identical accrual system). Pension payments can only be done to individuals employed in a company covered by the AFP system during 7 out of the last 9 years before age 62 as well as the last three years before retirement.

If this requirement is met, incomes (up to 7.1G) provide a lifelong pension promise of 0.314 per cent of the individual income each year from ages 13 through 61. The yearly accrual of 0.314% of income is indexed according to the increase in G. At retirement the sum of these (indexed) accruals are transformed into a lifelong benefit through division by the ratio number ("forholdstall"), the same number as explained in the previous paragraph. If retirement is before 67, an additional yearly amount of NOK 19,200 is paid until 67. The lifelong amount is reduced such that the expected sum received over life will be the same. The cohorts of 1944-1962 receive a special compensation amount, differentiated by birth year, to compensate for their short

[3] Exactly 1.00 for the 1943-cohort, which is the basis for life expectancy adjustment. Increasing for younger cohorts.

time to adapt to the new rules under the pension reform. For example the 1953 cohort receive a yearly amount of NOK 13,524 if they retire at 62. The amount is reduced by 10% of this for each cohort up to the 1962 cohort. The compensation increase with later retirement according to neutrality in the expected totally received compensation over life.

As the study assumes that individuals stay with their current employer until retirement, individual cases where people lose rights to an AFP pension are not modelled.

Benefits from funded pension plans based on accumulated rights (DB)

A core challenge when doing these calculations is the assumptions made related to coverage of occupational pensions scheme in private sector that each individual has been a member of, and of course future coverage. These assumptions are based on a number of survey data reporting occupational pension arrangements across industries as well as aggregate data on pension coverage. Hence, we make a "well informed guess" on the distribution of such arrangements in different industries. The different plans in one industry could be, i.e., a 66% DB plan with 30 years of membership requirement for a full pension, or in some case a 60 or 70% DB plan. Before 2006, around 40% of private sector employees were covered by DB pension plans, aiming at mostly 66% of final salary, including an estimated state pension. The system is not fully integrated with the state pension as a change in the national pension benefit does not imply a change in the DB benefit to keep the overall pension benefit constant.

As the data sets do not allow identifying individuals covered by an occupational pension plan, the study randomly selects individuals according to the probability distribution of DB plans' coverage by industry. All selected individuals are assumed to be covered by the typical plan in their industry for their whole career.

All public sector employees, including some state owned companies, first of all hospitals, are covered by a DB occupational pension plan. State employees have their DB-pension financed on a pay-as-you-go basis. Municipality workers are covered by the same plan, but it is financed as a regular private funded life-insurance plan.

The occupational pension scheme for public employees is fully integrated with the state pension scheme. Together, they provide a full pension after 30 years of contributions at 66% of final wage at 67 years old. If the benefits from state pension scheme decrease, the occupational scheme will cover the gap. An early retirement scheme was introduced in 1989 and allows public sector workers to retire from the age of 62. Between 62 and 65, this scheme offers a benefit equal to what could be accrued in the national pension system plus a fixed amount of 20 400 NOK. From the age of 65 benefits are calculated based on the 66% rule (provided they have contributed for 30 years). This means that even though standard retirement age is 67, full pensions can be achieved one or two years earlier if contributions are made for 30 years or more.

The study assumes that the individual covered by a DB pension plan at the time of the data collection will continue to be included in the same plan until she/he retires. The study therefore calculates the total number of years in the plan as the number of years in the plan at the time of the data collection plus the remaining number of years until retirement. Years in which the individual has earned less than 1 G are excluded from pension accrual. The assumed state pension follows the rules of the old system, but reduced with 0.1 G for married and with 0.25 for singles, thus creating an advantage for the employee ("coordination advantage"). In the public sector the pension is adjusted for life expectancy improvement through division by a standardized ratio number. The ratio number is the same as the ratio number for the state pension/AFP

for individuals born before 1954 (old system). For individuals born after 1962 (new system) it is the ratio of the annuity divisor for their cohort to the division number for the 1943 cohort. In the public sector an individual born before 1959 is guaranteed to receive 66% of their final salary if they retire at 67 with 30 serving years. In the private sector we do not assume any life expectancy adjustment.

Through this, we are able to conduct specific calculations regarding pension matters in various industries and on different groupings of individuals by relevant background variables

The study calculates DB benefits, using the actual formula of the plan as if the individual is a member their whole career based on their individual wage. This is a simplification since many employees in reality would have been members of various DB-plans due to the fact that move between jobs and employers. This would give them an individual pension rights from the previous employer ("free policy"). For private sector employees this could imply a weaker indexation than what one could receive if one had been member of the same collective arrangements. For public sector employees shifting job has no impact on previous pension rights since these are regulated according to the general wage increase (G).

There are, however, some more very specific challenges when calculating the actual benefits based on final salary. Defined benefit plans use – as a starting point – income at retirement as the pensionable income. However, in their full extent the plan definitions contain provisions which make them not "straight final income" plans, and this is the case both in the private sector and the public sector. The two most important characteristics of these provisions are described in the following.

Firstly, in the case of a reduction in the income level prior to retirement, both previous higher income and the final lower income is taken into consideration. For public pension plans, the mechanism is such that when the income reaches its highest, the higher income counts also for prior periods. This "higher of" provision is applied at any point where there is a reduction in income during the career resulting in a "higher of" income path, where past income is indexed in line with the G-increase from when the income was earned until retirement. In order for the higher income to be made effective retroactively, it is a requirement firstly that the reduction amounts to at least 10% of G nominally and secondly that the higher income has been in effect for a consecutive period of at least two years. At retirement, the pensionable income is stipulated as an average of this constructed "higher of" income path. This will coincide with the final income if the income is at its highest at retirement, otherwise it will be higher than the final income.

For private pension plans the benefit formula for the accrued benefit is based on the service period and the current income at any point in time in such a way that the accrual takes place on a time-proportionate basis. If applied without modification, the benefit formula would then give rise to an immediate drop in the accrued benefit in the case of reduction in income. However, in this case the accrued benefit based on the income prior to the reduction is preserved as a "floor" until the benefit formula eventually results in a higher accrued benefit later in the career. An even more specific provision is the treatment of reduction in income following a change of position at the same employer. In this case the drop in the accrued benefit that the benefit formula gives rise to is preserved as an individual fully paid policy (Norwegian: "fripolise"), while the accrued benefit resulting from the lower income is used as a basis for building future accruals.

Secondly, a common feature for private and public plans is that the benefit formulae award certain advantages to part-timers, in the sense that for two individuals with the same nominal

income where one is a part-timer and the other is a full-timer, the part-timer will be entitled to a higher benefit than the full-timer. In applying this feature of the benefit formula in practice, potentially varying part-time over the entire career is considered as an average.

The contents of the income series information in our data set is such that it has not been possible to fully capture all these details in our estimates for the defined benefit pension amounts, and we have therefore adopted certain approximations and modifications which are described in the following. The complete income history (earned and projected) contains the income as such, but there is no information as to whether the income has been earned in a part-time or a full-time position. In the absence of such part-time information, we have calculated the defined benefit amounts as if all income has been earned in a full-time position. Since the part-timer advantages are then disregarded, this will tend to underestimate the benefit amount. On the other hand for an individual that in reality has a career with gradually reduced part-time, using the final income earned in a full-time position will tend to overestimate the benefit amount. The "higher of" of provision for pensionable income in public pension plans has been implemented without taking into consideration the requirements of a nominal reduction of at least 10% of G and two year's duration of the higher income, which will tend to overestimate the benefit amount.

For private defined benefit plans the described «floor» provision for the accrued benefit is included in our estimate for the benefit amount. However, since we there is no information in the income data about change of occupation/position, the effect of the "fripolise"-provision for reduced income following a change of position has not been estimated.

We have also constructed a "notional final income" which is meant to represent a measure of a stable income level close to or at retirement. In the first step we consider income over consecutive five-year periods starting at age 55 and ending at age 69, which comprises eleven consecutive periods (55-59, 56-60,…, 65-69). The second step is to compute the average income within each of these consecutive periods. Finally, for the notional final income we use the highest of these averages.

Taken together we have tried to construct a calculating design that captures the actual way that the final salary DB-plans work when income trajectories and working time varies.

When transforming the value of a payment over one given period into a corresponding lifelong payment starting from retirement on we make economic assumptions in accordance with The Norwegian Accounting Standards Board's guiding assumptions as of 31.08.2013. For the general wage increase and the increase in G, we assume a growth of 3.5% annually. Pension components that are not subject to indexation, i.e. the addition to AFP of NOK 20,400 (public) and NOK 19,200 (private), are assumed not to be regulated. The future payments are discounted by the discount rate 4.1%.

For the survival probabilities we apply the new standard Norwegian life insurance and pension tariff called K2013[4]. The present value at retirement of the original payment can thus be computed. This is then divided by the present value of a unit payment starting at retirement and regulated in accordance with the pension type to find the resulting lifelong pension benefit.

[4] With parameters set according to the minimum demands of The Financial Supervisory Authority of Norway.

Benefits from funded pension plans based on assets accumulated (DC)

DC-plans were introduced in 2001 and made statutory in 2006 (minimum of 2% savings a year). Maximum saving levels where 5% for income between 1 and 6 G and 8% for income between 6 and 12 G. Saving levels in DC plans are increased to 7% for income up to 7.1 G and to 25.1% for income between 7.1 and 12 G from 2014.

Most occupational pensions in Norway are now pure DC-plans in private sector. As the data sets do not allow identifying individuals covered by an occupational pension plan, the study randomly selects individuals according to the probability distribution of DC plans' coverage by industry.

All selected individuals are assumed to be covered by the typical plan in their industry since 2006 (2%) or from 2003 if that industry was already offering DC pensions before it became mandatory (5%). Due to new regulations savings levels can be increased. We therefore have assume that half of all companies offering the former maximum saving levels of 5%increase this to 7%.

We assume that the DC pension accruals provide a yearly return of 4.4% in accordance with The Norwegian Accounting Standards Board's guiding assumptions as of 31.08.2013. The study assumes that DC assets are transformed into a life annuity. In reality benefits from DC schemes are, as a main rule, paid as a terminating pension which pays a benefit for a minimum of 10 years and at least until the age of 77 (80).[5]

To compute the cost of the life annuity into which the DC account is converted to we apply the tariff K2013 and use a discount rate of 2.5 %. The expected value in NOK of a unit life annuity, i.e. a payment of 1 NOK a year for the remaining lifetime, at age 67 given these assumptions are given in the following table:

Year of birth	Men	Women
1953	15.6271	17.4105
1965	16.3131	18.0994
1975	16.8273	18.6334

Individuals can also have personal pension arrangements but these are not taken into account by this study. Personal pension arrangements include Individual Pension Agreement (IPA) and Individual Pension Saving (IPS). They are however of limited importance in the overall Norwegian pension system (around 10% of the population is covered). In addition, none of the available data sets allows identifying which individuals have such plans.

[5] The minimum age limit is increased to 80 to better protect people from the longevity risk from 2014.

3.3 Retirement savings adequacy indicators

OECD has developed a set of indicators in order to make national analysis comparable. The Norwegian study has taken the OECD indicator definitions as a point of departure and has chosen the following measures and indicators:

- Pension benefits are calculated as the total accumulated pension right and a lifelong yearly pension is then calculated for all individuals. The "first year" of payment is presented as the relevant pension level measured as a given number of base amounts (G). Benefits can then be compared for people retiring in different years.
- Coverage: the proportion of individuals receiving pension benefits from each of the different income sources, i.e. the coverage of different pension programs.
- Income composition: the study calculates the average share of total pension benefits coming from each of the different income sources such as the national pension system, AFP and different occupational schemes.
- Replacement rate:
    - Ratio of pension income at retirement to final earnings
    - Ratio of pension income at retirement to career average earnings (excluding years with no earnings)

We have defined final wage as the highest mean yearly income over overlapping 5-year periods after age 55. This means calculation of pensions at the highest income point both when this is achieved at pension age or at an earlier point. If income is reduced after fore example 55 years and a person have 20 year membership at this point in a DB scheme the pension is partly calculated from 20/30 of this income level and partly from income after reduction[6].

The replacement level ratios allow us to reply to the question, Can people sustain their consumption level?

Moreover, the study calculates the proportion of individuals with a replacement rate above a target replacement rate set to 2/3 of previous average income or 66%. 2/3 is not just a concrete pension ambition in many occupational schemes it is also a historical social policy ambition among others found in current programs of the Norwegian Confederation of Trade Unions.

OECD also recommends the use of a comparison with current retirees where one calculates the proportion of individuals with a pension income above the average pension earnings of people recently retired. Recently retired people are defined as those who have spent up to five years in retirement. In the Norwegian data set there is no information on pension payments. As an alternative we calculate an indicator showing the proportion with pension å payments higher the average pension for the age group born in 1953.

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[6] Max{average yearly income age 55-59, average yearly income age 56-60, average yearly income age 57-61,…,average yearly income age 65-69]}

In all the cases, the indicators are broken down by age (5-years age brackets), gender and income (3 groups: 20% lowest income; 20% highest income; 60% remaining middle income).

Moreover, the study calculates the proportion of individuals with a pension income above a low income line. There is no country-specific definition of the poverty line in Norway. 50% of median individual household personal consumption level is also less than the actual minimum pension guarantee (traditional poverty measure). As an alternative indicator the study uses 50% median personal income in the population.

The study also compares the distribution of pension income using the GINI-coefficients and compares distribution across different age cohorts as well as between wage-income distribution and pension income distribution.

Chapter 4 Public and private pension mix – coverage and pension levels

This chapter maps the structure of pension rights and pension capital accumulation in Norway. Pensions are accrued in both public and private schemes, hence differences in membership, or coverage, is vital to understand variations in future pension payments. Therefore, the chapter starts out with an analysis of pension coverage and an attempt to identify the different private-public pension packages (institutional mix) a person can be covered by or be members of.

The next step in the analysis is to give an overview of the corresponding future pension levels and replacements rates, produced by these pension packages. There are significant differences in replacement rates, for example between public and private sector employees. We have chosen to start out with replacement rates calculated as lifelong payments when pension withdrawals starts at 67 years. Pension withdrawal at 67 is of course only an illustration of one possible adaption to a flexible pension age, and not necessarily what will be the actual pension behavior in the labor market. Nevertheless, differences in replacements rates at 67 can serve as a good starting point for the analysis even though there is no permanent pension age at 67 any more in Norway: 67 years used to be the permanent pension age and still serves as a cultural or social reference point for individual pension choices and actual pension behavior. In addition, many companies have a formal right to let people go at the age of 67, depending on the benefits available under their occupational pension scheme, even though this approach is under attack both legally and politically.

Chapter 4 also introduces a first analysis of how future pensions will vary between age groups when future economic risk connected to increased life expectancy to a larger extent will be picked up by the individual and not the state or the employers. These calculations are, as before, based on a retirement age of 67 years. In chapter 5, we follow up these analyses of the age effect in the Norwegian pension system by providing calculations of replacement rates for person born 1953, 1965 and 1975. In chapter 6 we look at varying ages of labour market withdrawal, i.e. 62, 67 and 70.

Lastly, the chapter offers estimations of the actual pension payment profile that the major pension packages provide. This is done in order to identify the precise pension profile that different groups will have at various ages of their retirement period. In the estimations of replacement rates for the rest of the report however, we have chosen to calculate all pension accrual as if they are subject to transformation into a lifelong payment. This is done in order to make pension accrual from different schemes comparable.

The main findings in this chapter are:

- As much as 30% of employees in the private sector have only access to DC2% on top of the national state pension, while 22% have far more generous additional pensions being covered by both AFP and higher quality occupational schemes (AFP and DB/DC+).

- Public sector employees will have a higher pension level than private sector employees when retiring at 67 years, even those private employees covered by with generous pension packages.
- Life expectancy risk transfer will translate into significant lower pension income for younger generations when national pensions, AFP and occupational schemes are reduced.
- Many individuals covered by DC occupational plans will see reduced pension levels after 77, especially younger generations which will rely more on these plans at retirement.
- Early retirement scheme for public employees implies lower benefits for the first years of retirement.

4.1 The working age population and their pension accrual

Today's population between the ages of 35 and 61 years in our dataset can be divided into different groups. We have a full income history of all individuals and we use their current labor market position, as well as the status of their employer in a given year regarding coverage of collective agreements in order to select those being covered by a collective agreement.

As discussed in chapter 3, a group of individuals with income histories, but with missing organizational number and employment status is excluded from the data set. Also self-employed are excluded. The data set seems to be representative for example of industry structure, even though there is a small overrepresentation of public employees. The structure of the data set is shown in table 4.1. It shows the proportion of people employed in the public and private sectors respectively. Moreover, it shows two groups that we will exclude from the later analyses. One is a group of persons that have no or very little income during their career even though they are registered as currently employed (less than 1 G in average over the working career) or those who have no registered employment and have little or no income over their working life, i.e. persons being supported in the household. A second group consists of people registered at the point of data collection as public transfer recipients (disability pensions). These are also excluded from the calculations, i.e. we expect them to stay on disability pensions until moving to old age pension at the same level.

As shown in table 4.1, a relatively large proportion of the age group 35-61 is employed in Norway.

Table 4.1 Population age 35-61 by employment status.

Employment category	Percent of population[7]	N
People with no employment or very low income careers (<1 G)[8]	3.1%	4353
Public transfer recipients	8.0%	11 203
Private sector employees	53.7%	75 155
Public sector employees	35.2%	49 312

The large numbers of public employees found in Norway (around 33% of all employees) are members of a defined benefit scheme that secures a pension promise of 66% of final salary after 30 years of payments including national pension rights. Hence public employees do have a unique pension arrangement different from other segments of the labor market.

Private sector employees, on the other hand, find themselves covered by a number of various contractual and company based occupational schemes that serve as a topping up of pensions from the national pension system. Employees in an individual company covered by a collective agreement are members of the labor market contractual pension scheme (AFP).

Furthermore, we make assumptions regarding what kind of occupational schemes one can find in each industry. These assumptions are based on information found in former company survey data on occupational pensions and then a random distribution of an occupational scheme to each company so that the occupational pension structure in each sector adds up to the correct aggregate levels. A company can either offer their employees a defined benefit (DB) scheme aiming at 66 or 60% of final salary after 30 years of membership, or a defined contribution scheme (DC) that is legally required to save at least 2% of yearly wage or voluntarily up to 5% of wage (up to 6 G) and 8% from 6- 12(G). The maximum contribution rate is increased with effect from 2014 (7% up to 7.1G and 25.1% between 7.1 and 12 G).

There are continuous changes to be found in the occupational pension market, in particular an ongoing shift from DB to DC schemes. In the calculations we have therefore estimated a future increase in the contribution rate from 5 to 7% in half of the companies previously offering 5%. We assume the shift takes place from 2015 and onwards. The level of DB schemes is held constant in the estimations.

The contractual labour market scheme coverage - AFP

An important part of private sector pension accrual in Norway takes place in the AFP-scheme. The scheme provides pensions to employees covered by the AFP-scheme that are still members

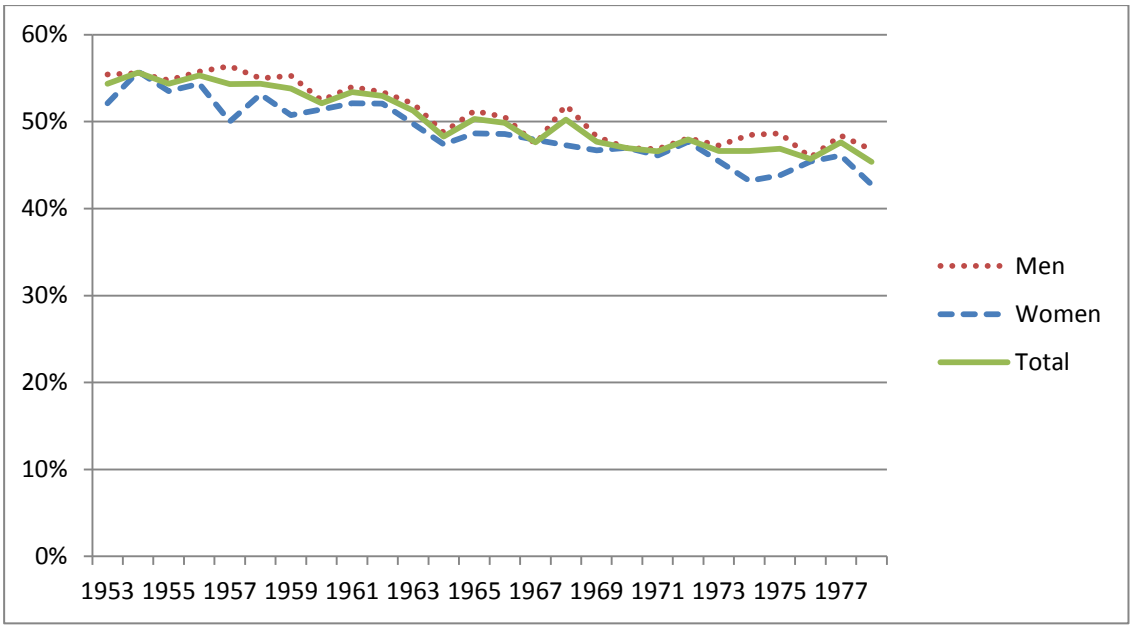
[7] Excluded from the population are 33 291 people with no organization number and with average life income exceeding 1 G and where none are disabled.

[8] Of which 3070 have no org. nr, 577 have an org nr within the public sector and 706 within the private sector.

upon retirement. As the dataset offers a possibility to identify employees covered by collective agreements we will look in some more detail into the AFP coverage before turning to the relative importance of different combinations, or pension packages, where employees can accumulate pension capital and pension rights.

Figure 4.1 shows AFP coverage by age. We have also added coverage by age for both men and women.

Figure 4.1 Coverage of AFP by age. Men and women in private sector.



AFP-coverage is highest among the oldest age groups. A majority of them is covered by AFP. Among the youngest age group in our sample (35-40) AFP coverage is 10 percentage points lower. Men have a somewhat higher coverage than women. This gender difference is caused by underlying differences in collective agreements across industries: coverage is relatively low in private services as well as in retail, hotel and restaurants.

Because of the benefit accrual rules in the AFP-scheme that only allow pension withdrawals if a person has been covered at least 7 out of the last 9 years before 62, the higher coverage among the older age group is of special importance. As a pension instrument, it is correct to argue that more than 50% are covered by AFP even though coverage of collective agreements in average in private sector is significantly less. This is very often misunderstood in the public debate when AFP is said to cover only a minority of private sector employees.

Table 4.2 shows the AFP coverage by industry clearly displaying the large differences that exist between industries in private sector. Women tend to work more often than men in private services or other parts of the private sector where the system of industrial relations is less developed and collective agreements are not as wide spread.

Table 4.2 AFP coverage in private sector by industry. Percent of employees covered.

Industry	AFP. % covered	N
Oil and mining	80	2356
Manufacturing	74	10 996
Construction, energy	43	3494
Retail, hotel and restaurant	43	7622
Transport and communication	54	4226
Financial services	67	2128
Real estate and other private services	31	4223
Private education and health	30	1248
Private personal services	49	1214

Private public pension packages

In this section we attempt to show the relative importance of different combinations of public and private pension schemes that an employee could be covered by. This will provide what one could call an institutional overview of the various mechanisms of pension accrual.

The new national pension system is based on an accrual of 18.1% of pensionable income pr. year, while the AFP-scheme according to our calculations can be said to give 3-4% of an average pensionable income each year for those qualified at retirement in contribution (yearly benefit accrual of 0.314%). On the top of these arrangements the occupational pension schemes offer 2 to 5% (later 7%) savings a year. Contributions in DB-systems for low and average incomes varies according to gender and age but are over the working career normally somewhat higher than the 5% found in the DC plans. Contributions in both DB and DC systems are higher for incomes over 7.1 G allowing them to compensate for the lack of contributions in the national system. Therefore, for income over the income ceiling in the national system (7.1 G) occupational pension membership is vital.

As already pointed to, public employees are covered by a "gross" DB system aiming at 66% of final (or highest) salary after 30 years of membership including the payments from the national system.

Combining the most common groups of pension scheme membership possibilities the following combinations or what we call "pension packages" could be found:

- Public sector "gross" DB pensions (including national pensions) (FT/DB66)
- National pensions (FT), Contractual AFP and DB 66% - (FT/AFP/DB66)
- National pensions (FT), Contractual AFP and DB 60% (FT/AFP/DB60)
- National pensions (FT), Contractual AFP and DC 2% (FT/AFP/DC2)
- National pensions (FT), Contractual AFP and DC 5% (FT/AFP/DC5)
- National pensions (FT), DB 66% (FT/DB66)
- National pensions (FT), DB 60% (FT/DB60)
- National pensions (FT), DC 5% (FT/DC5)
- National pensions (FT), DC 2% (FT/DC2)

There are also DC occupational schemes that offer saving levels at 3 or 4%, or even 4.5%. Statistics from Finance Norway on an aggregate level show that around half of the employees covered by DC arrangements are found in 2% minimum schemes and that the overall majority of the remaining DC members are to be found in 5% schemes (Veland 2013). For simplification we therefore assume that DC schemes are either minimum or maximum schemes until 2014. After 2014 DC schemes are divided into three groups for future accrual (2, 5 and 7% up to 7.1 G). Table 4.3 shows the percentage of employees covered by the different pension arrangements.

Table 4.3 Percent covered by different pension arrangements by sector and industry.

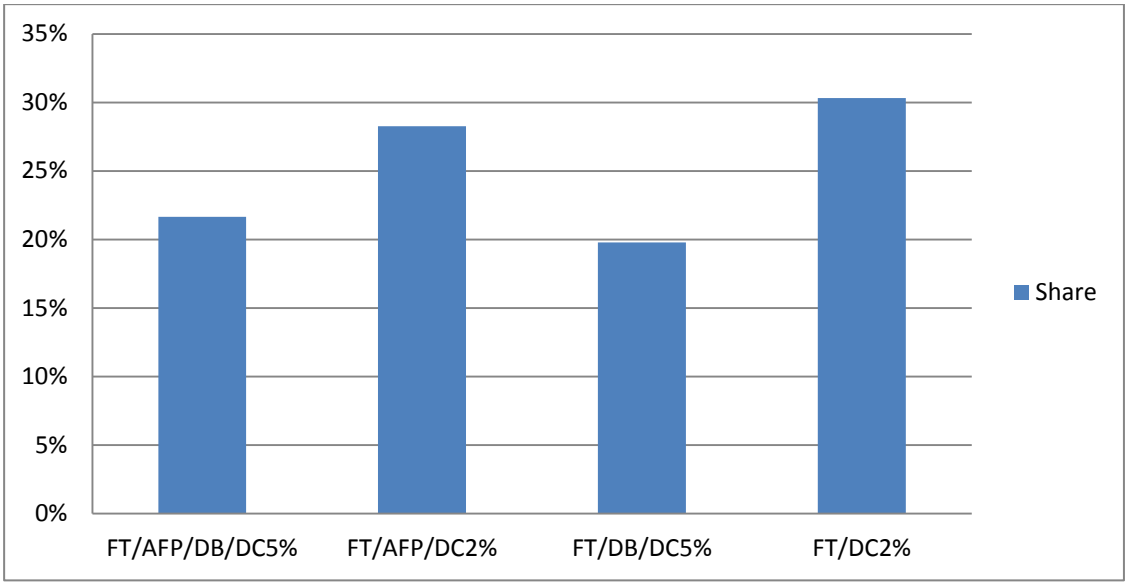
Benefit package: Sector or industry:	FT/ AFP, DB66	Ft/ AFP/DB60	FT/ AFP/DC2	FT/ AFP/DC5	FT/ DB66	FT/ DB60	Ft/ DC2	Ft/ DC5	Sum
Public sector					100				100
Private sector	13	3	28	6	13	1	30	5	100
Oil, gas, mining	65	8	0	8	15	2	0	2	100
Manufacturing	6	11	47	10	2	4	17	3	100
Construction, energy	11	0	30	2	13	0	41	3	100
Retail, hotel and restaurant	10	0	29	3	14	0	39	5	100
Transport and communication	13	0	38	3	12	0	32	2	100
Financial services	27	0	3	37	12	0	2	18	100
Real estate and other private services	9	0	18	3	21	0	41	8	100
Private health and educational ser–vices	11	3	12	4	25	7	31	8	100
Private personal services	17	5	22	5	19	5	21	6	100

A difference in pension coverage and hence in pension accrual is clearly found in the Norwegian labour market. While all public employees are covered by the "gross" DB pensions, around 16% are covered by both AFP and a DB schemes on top of national pensions in private sector constituting the private sector pension elite. On the other hand, a large group of 30% of the employees has access only to a 2% DC scheme topping up their national state pension rights.

One does also find important variation across industries. In the private sector, the pension accrual winners are found in oil and gas production and financial services. On the other side of the scale we find construction and private services where a majority is not covered by AFP and large groups are members of DC schemes only providing the statutory minimum contribution of 2%.

If we add all DB schemes together with the best DC schemes we can create a simplified picture of four major groups of pension accrual in private sector. Figure 4.2 shows that being covered by a contractual agreement also increase the possibility to have an occupational pension higher than the minimum contribution level.

Figure 4.2 Percent private employees covered by different pension packages. Age 35-61.



4.2 Pension packages and replacement rates at 67

Coverage by various pension packages combined with specific income trajectories produces different replacement rates.

We have calculated the median and average replacement rate relatively to both average lifelong incomes, as well as to a measure of final income when retiring at 67. We have defined final wage as the highest mean yearly income over overlapping 5-year periods after age 55[9]. In accordance with the OECD standards set for these studies we have also estimated the proportion having replacements rates higher than 2/3 of previous life average income as well as a ratio where pensions are seen relative to the average future pensions for persons born in 1953. We also show the 10% max and min values and the standard deviation in order to illustrate the distributional outcome.

Pension levels in public sector

In table 4.4 we show the different indicators for the public sector at the point of labour market exit at 67 years of age. Because of special benefit rules for persons with full contributory period the same pension level can be obtain at 65. For the purpose of comparing with private sector benefit levels at 67 we have used the same exit age in public sector.

[9] Max{average yearly income age 55-59, average yearly income age 56-60, average yearly income age 57-61,…,average yearly income age 65-69]

Table 4.4 Pension indicators. Public sector DB "gross" 66% pension. Individuals with very low final income are excluded from the calculations of RR-FI. 67 year exit.

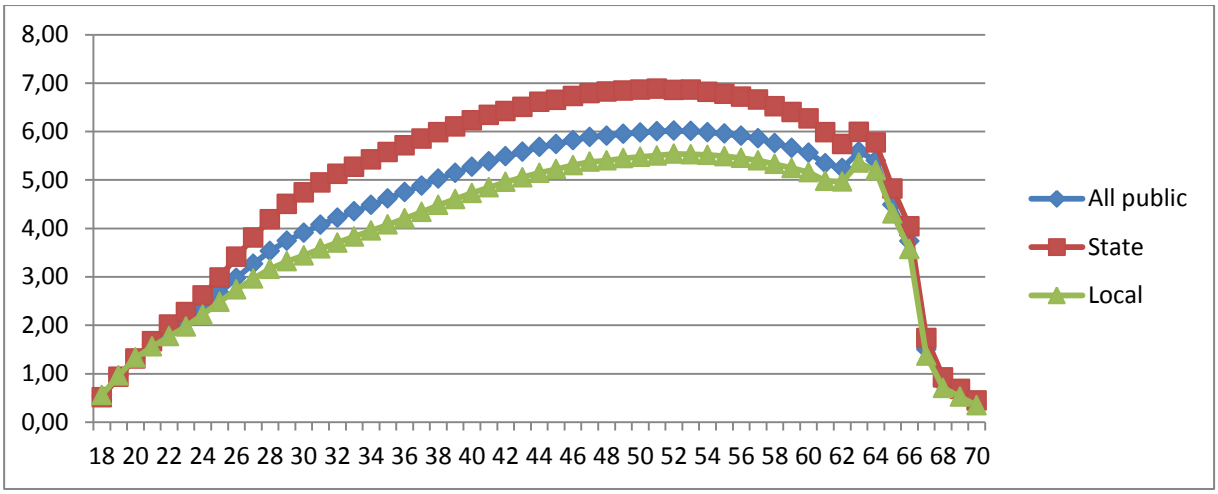
	Public employees at 67 Median/Average	10% min	10% max	Standard deviation	N
RR-LI. Average life income	Median: 76.8% Average: 81.2%	60.9%	106.8%	21.1%	49 312
RR-FI. Final income.	Median: 66.3% Average: 72.1%	56.9%	92.6%	24.2%	48 146
Ratio 1 - prop 2/3 Proportion more than 2/3 of average life income	82.2%	NA	NA	NA	49 312
Ratio 2 - fut.pen. Average future pension 1953	Median: 87.4% Average: 93.0%	56.7%	139.5%	32.2%	49 312
Average future pension in 2013 NOK/G	Median: 301 609 Average: 320 996	195 575	481 436	111 258	49 312

The calculated indicators show a relatively high pension level generated among public sector employees. Over 80% will receive more than 2/3 of their average life income in yearly lifelong pensions. Relative to their average highest income level (our definition of final income) the median replacement rate is 66%. The reason that the replacement rate is as low as 66% of final income is first of all that younger age groups will find their pensions reduced when life expectancy increases. Some individuals will also have shorter membership than 30 years, hence seeing a corresponding relative reduction in their pension promise of 66%.

Before turning to private sector employees we will discuss briefly the importance of the final salary DB system in the public sector. This DB system offers a calculation of pensions at the highest income point both when this is achieved at pension age or at an earlier point. This means that, for example, if income is reduced after 55 years and a person has a 20 year membership at this point, that person will have 66% of partly this income, partly the income after reduction[10] as a lifelong pension right. This means that the shape of the life income is of great importance. In figure 4.3 we show the profile of life (pensionable) income for state and local employees as it is recorded for historical income and estimated for future income in our dataset. Especially state employees have a relatively high peak income level and will have significant effect of the final income benefit calculation mechanism. Local employees have a more flat income profile over their working career.

[10] In this case the salary in the defined benefit formula is calculated as 20/30 times the salary before reduction plus 10/30 times the salary after reduction.

Figure 4.3 Life income profiles. Recorded and estimated pensionable income in G. Public sector. State and local employees.



In addition to the income profile the duration of the membership period is important since the pension scheme for public employees offers a 30 year membership period to qualify for a full pension. An important question then, is the proportion of state and local employees with relatively short income careers if they continue to work until 67. In total only 3.5% (2.7% men, 4.1% women) of the state employees have less than 30 years with an income above 1 G, while the same proportion for the local public employees is 6.5% (3.4% men, 7.6% women). More important, a total of 18.9% of the state employees have less than 40 years with an income above 1 G, while the same proportion for the local public employees is 28.3%. The following table also shows proportions of people with less than 30/40 years with income above 2 G.

Table 4.5 Proportion of employees with less than 30/40 years with income above 1 G and 2 G.

> 1 G	< 30 years	< 40 years	> 2G	< 30 years	< 40 years
State	3.5%	18.9%	State	5.9%	33.8%
Local	6.5%	28.3%	Local	12.3%	45.7%
Men state	2.7%	14.9%	Men state	3.7%	26.7%
Women state	4.1%	21.9%	Women state	7.5%	39.2%
Men local	3.4%	18.1%	Men local	5.5%	30.9%
Women local	7.6%	31.9%	Women local	14.7%	51.0%

Figure 4.4 Distribution of years with an income higher than 2G

The analysis of income profile and membership period indicate that state employees will have the best effect of this system (final wage and 30 year), while local employees have less effect of this system. On the other hand, a significant group of local employees is served well by 30 rather than 40 years of membership to qualify for a full pension.

We can illustrate the nature of public sector occupational pensions by estimating an employee's actual pension at 67 if they were covered during their whole career by a private sector system offering AFP as well as a DC accruing 5% of income from 0 to 7.1 G and 23.1% of income between 7.1 and 12 G compared to their actual pension and replacement rate. Table 4.6 shows the result of this experiment. It illustrates first of all the quality of public sector pension schemes. However one can see that it is state employees that would see the biggest loss in replacement rate if the system is reformed into a typical private sector arrangement. State employees would see a reduction in pension level of 2.3% while local employees will see 2.1% reduction. It should be underlined that these illustrative calculations are based on historical income data and a prognosis of a distinct income reduction close to retirement. This is because the prospective income model is based on income and behavior among previous cohorts. If for example a majority of local employees have even longer income careers in the future the difference between the public and private occupational pensions system will be significantly reduced. By restricting the group to persons with a lifelong average yearly income higher than 3.5 G we illustrate the pensions levels accumulated among persons with what could be seen as close to full time working careers.

Table 4.6 Replacement rate (RR-LI) for public employees at 67. Actual rate and hypothetical "private" rate.

Average RR-LI	National insurance	Hypothetical AFP	Hypothetical 5% DC with top 23.1%	Total RR-LI	Actual total RR-LI	N
State-All	49.2%	11.0%	14.1%	74.4%	76.7%	17 390
Local-All	56.5%	11.9%	13.1%	81.5%	83.6%	31 922
Public-All	54.0%	11.6%	13.4%	79.0%	81.2%	49 312
State >3.5 G	46.3%	10.8%	14.3%	71.4%	74.1%	15 429
Local >3.5 G	49.2%	11.3%	13.3%	73.8%	76.9%	22 895
Public>3.5 G	48.0%	11.1%	13.7%	72.8%	75.8%	38 324

The next table illustrates that this hypothetical private plan will produce more or less the same replacement levels when calculated only for those with a 40 year career or more.

Table 4.7 Replacement rate (RR-LI) for public employees at 67. Actual rate and hypothetical "private" rate for individuals with income careers longer than 40 years and income level higher than of 2G.

Average RR-LI	National insurance	Hypothetical AFP	Hypothetical 5% DC with top 23.1%	Total RR-LI	Actual total RR-LI	N	Average income
State-All	46.65%	10.94%	14.30%	71.89%	72.15%	11 206	527 738
Local-All	49.85%	11.51%	13.17%	74.54%	74.37%	16 777	441 295
Public-All	**48.57%**	**11.28%**	**13.62%**	73.48%	**73.48%**	**27 983**	**475 912**
State >3.5 G	46.29%	10.89%	14.34%	71.52%	72.00%	10 942	533 831
Local >3.5 G	49.00%	11.42%	13.24%	73.66%	74.06%	15 662	453 338
Public>3.5 G	**47.88%**	**11.20%**	**13.69%**	72.78%	**73.21%**	**26 604**	**486 444**

Pension levels in private sector

Turning to private employees the picture looks quite different. AFP-coverage is important and the relatively large group that have pension accrual in all the three elements of the pension system can expect the highest replacement rates at 67 years (66%). For the group outside AFP the pensions levels drops to 56% at 67 years indicating that significant groups in the labour market will see relatively low pension levels if work careers are not extended. It should be noted that the replacement rate from the state system is less than 50%. This is due to the life expectancy adjustments that will reduce pension levels for the younger age cohorts at 67.

Table 4.8. Average RR-LI. Replacement rate relative to average life income in different pension arrangements. Private sector. With our without AFP- coverage. Average for all age groups. Exit at 67 years.

	With AFP	No AFP
FT (RR-LI)	48.04%	48.68%
AFP (RR-LI)	10.67%	0.00%
TP (RR-LI)	7.66%	7.56%
Privat sector RR	**66.37%**	**56.23%**

In figure 4.5 we take this analysis a step further and show replacement rates for all the different combinations of private public mixes of pension accrual.

Figure 4.5 Pension indicators at 67 year exit. Average replacement rates in private sector by pension package. RR average life income. Pension income composition in each group.

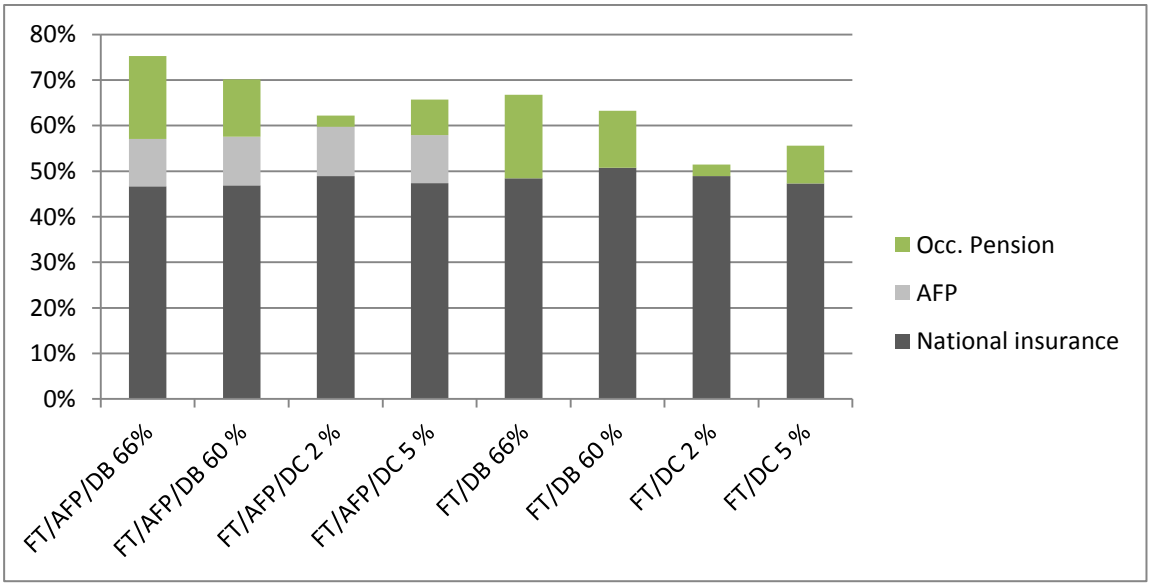


Table 4.9 sum up the different indicators calculated at 67 years work withdrawal for private sector employees.

Table 4.9 Pension indicators at 67 year exit. Private sector employees.

	Private employees at 67 Median/Average	10% min	10% max	Standard deviation	N
RR-LI. Average life income	Median: 59.4% Average: 61.3%	42.8%	81.0%	18.4%	75 155
RR-FI. Final income.	Median: 55.7% Average: 58.5%	35.6%	80.4%	24.0%	73 558
Ratio 1 – prop 2/3 Proportion more than 2/3 of average life income	31.1%	NA	NA	NA	75 155
Ratio 2 – fut.pen. Average future pen-sion 1953	Median: 81.8% Average: 85.9%	53.8%	119.8%	28.7%	75 155
Average future pen-sion in 2013 NOK/G	Median: 282 106 Average: 296 364	185 477	413 525	99 019	75 155

On average, private sector employees will see a replacement rate relative to their average life income of 61%. Not surprisingly there is a significant deviation around this mean, from 43% among the 10% with the lowest replacement rates to 81% among the pension winners. Opposed to more than 80% of the public sector employees, only 31% in private sector will see a pension level higher than 2/3 of their average life income. In other words, there are large groups of private employees that will see pension levels far below 2/3 even when they continue to work until 67 years.

Taken together the replacement rate structure in public and private sector could be summed up in this regrouped and simplified table (4.8) where we compare the replacements rates (RR-LI) in five important sub groups after the quality of their total pension package. While public sector employees will see a replacement rate of 81% relative to average life income, private sector employees are divided into four groups with replacement rates from 51 to 72%.

Table 4.10 Pension levels by employment group. Age 35 to 61.Exit at 67 years.

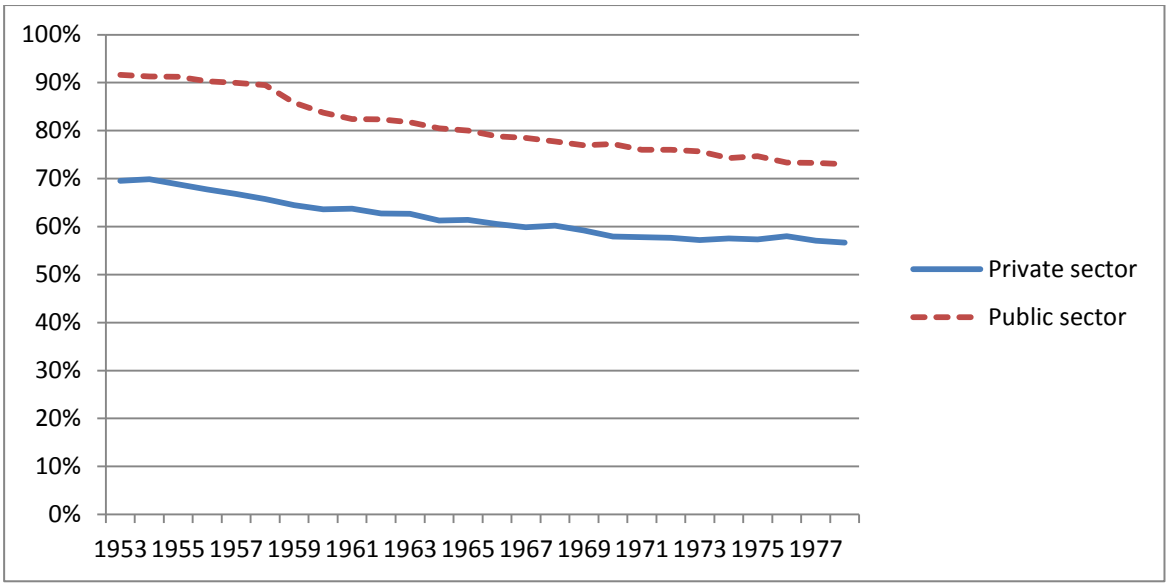
	Percent of employees	RR-LI at 67 – average/median	Average yearly pension 2013 Nok
Public sector employees	40	81.2(=54.0+0+27.2)/76.8	320 996
Private sector employees with AFP and DB/DC+	13	71.9(=46.9+10.5+14.5)/ 69.8	375 373
Private sector employees with AFP and DC2%	17	62.2(=48.9+10.8+2.4) /61.3	290 571
Private sector employees outside AFP DB/DC+	12	63.6(=48.3+0+15.3)/60.6	310 459
Private sector employees outside AFP and DC2%	18	51.4(=48.9+0+2.5)/50.2	236 147

4.3 Variation in replacements rates by age – the life expectancy risk transfer mechanism

The estimates given in the previous section provide an accurate picture of the expected future pension levels for all age groups 35 to 61 years today. This does, however, prevent us from identifying important variations in future pension levels due to differences in age. An important element of both public and private pension arrangements in Norway is a transfer of economic risk when life expectancy increases to the individual. Through a mechanism of adjusting benefits down according to new, and longer life expectancy prognoses, benefits in both public and private systems will be significantly reduced if a longer work career is not chosen. In order to better understand the logic of pension adequacy in Norway, calculations should therefore be done for different age groups.

The life expectancy risk transfer effect can be illustrated by the following calculation. We have estimated the median replacement rate at 67 years of pension withdrawal for all age groups and divided these into public and private sectors because of the different pension systems found in the two sectors.

Figure 4.6 Average replacement rates relative to average income at 67 by age. Born 1953 to 1978. Public and private sector employees.

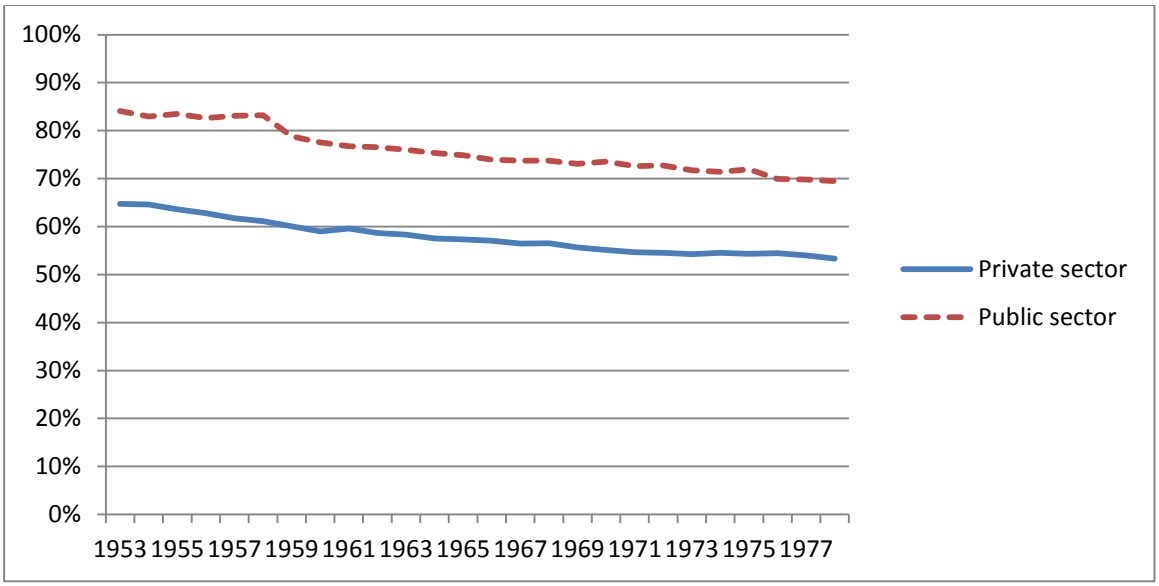


As clearly shown in figure 4.6 total replacement rates will be significantly reduced in the future if labour market behavior prevails. Of course one has to take into consideration that the starting point is high. In public sector replacement rates are reduced from an average level of about 90% for the oldest age groups to 73% for the youngest.

In private sector average replacement rates are lower, but still starts at levels around 70%, going down to 57%.

In figure 4.7 the same calculations as in figure 4.6 are shown, but only for persons with a life-long income higher than 3.5 G. This is done to illustrate the pensions levels accumulated among persons with what could be seen as close to full time working careers. As shown in the figure replacement rates are somewhat lower than for the sample as a whole. For the youngest full time working age groups in the private sector the replacement rates are going down to around 50% if labour market exit takes place at 67 years.

Figure 4.7 Replacement rate relative to average income at 67 by age. Born 1953 to 1978. Public and private sector employees. Income over 3.5G.



Because of the strong age effect, we have in the forthcoming chapters chosen to estimate separate replacement rates for three selected age groups. We find that the three following age groups provide good illustrations of how pension levels vary according to age, namely persons born in 1953, 1965 and 1975. The 1953 cohort is fully under old accrual rules, while the 1965 cohort represents the first age groups fully taking part in the new pension benefit calculations and, last, the 1975 cohort represents the younger age group having an expected stronger effect of longer life expectancy. These calculations are shown at pension withdrawal at 62 years of age as well as at 70 years.

4.4 The profile of pension payments

In this study we have chosen to use estimated yearly lifelong pension payments regardless of the actual payment profile in order to compare replacement rates. This is a simplification in the sense that many occupational pension schemes offer terminating pension, typically until 77 years. After 77, pension payments are terminated and the person will find himself or herself in a situation with lower pension payments. As already pointed to, the structure varies when it comes to the actual profile of pension payments. Therefore we will give some insights into the actual variations in pension payment profiles before again, in the next chapters turn to the indicator chosen where all pensions accrual is estimated as lifelong yearly benefits.

Broadly speaking there are four important groups with respect to pensions payment profile:

- Public - All members of public sector occupational schemes in state and local authorities will have all their pension accrual turned into lifelong payments

- Private 1 - Private sector employees that combine membership in the national pensions system, AFP and a defined benefit occupational scheme will be in the same position as public members, i.e. receiving only lifelong pensions.
- Private 2 - Private sector employees that are covered by different DC occupational programs will, as a general rule, have terminating pensions paid out to the age of 77. If they are covered by AFP they will have two elements paid out life-long in addition the terminated DC-pensions.
- Private 3 - Persons who are not covered by the AFP-arrangement will have payments from the national pension system as lifelong benefits and all their non-public pension rights as terminating payments. This is roughly speaking half of all private sector employees.

There are of course individuals that throughout their careers move between these groups, for example combining accrual from both public and private sector, hence achieve various combinations of the categories mentioned above.

Below we present the actual pension payment profiles for these four groups. In first four figures we have calculated the replacement rate (RR-LI) for persons born in 1953.

Figure 4.8 RR-life income average at 67 from 67 to 85 years. Born 1953. Public sector.

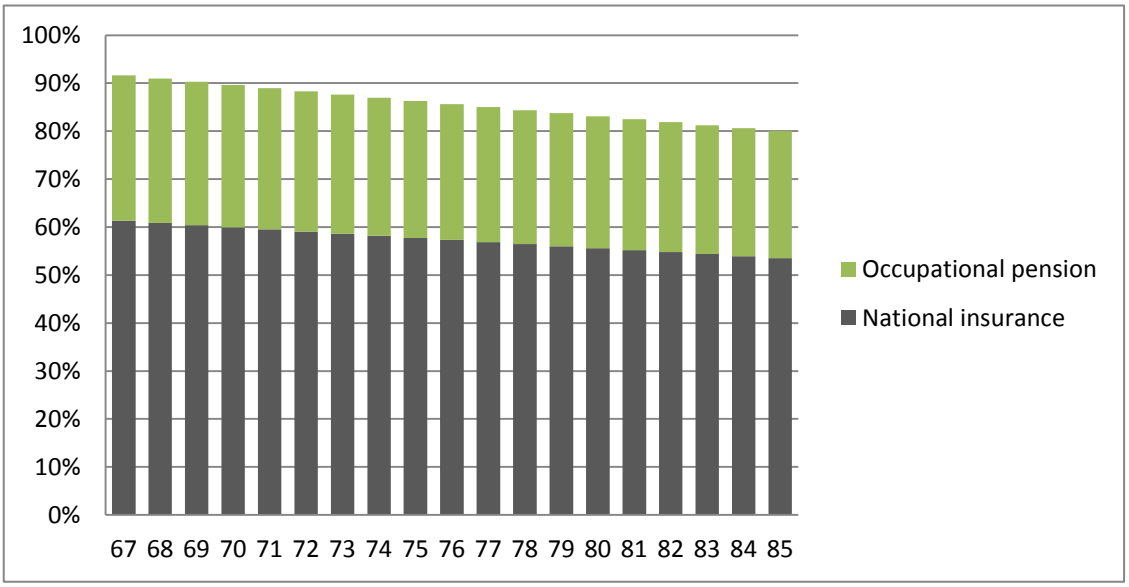


Figure 4.9 RR-life income average at 67 from 67 to 85 years. Born 1953. Private 1 group.

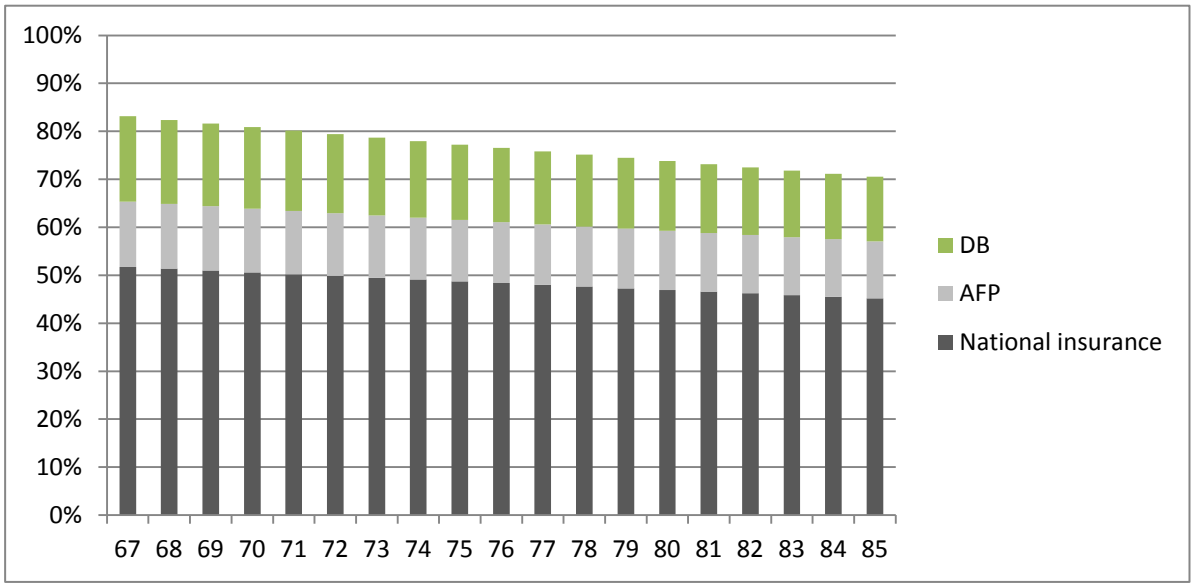


Figure 4.10 RR-life income average at 67 from 67 to 85 years. Born 1953. Private 2 group.

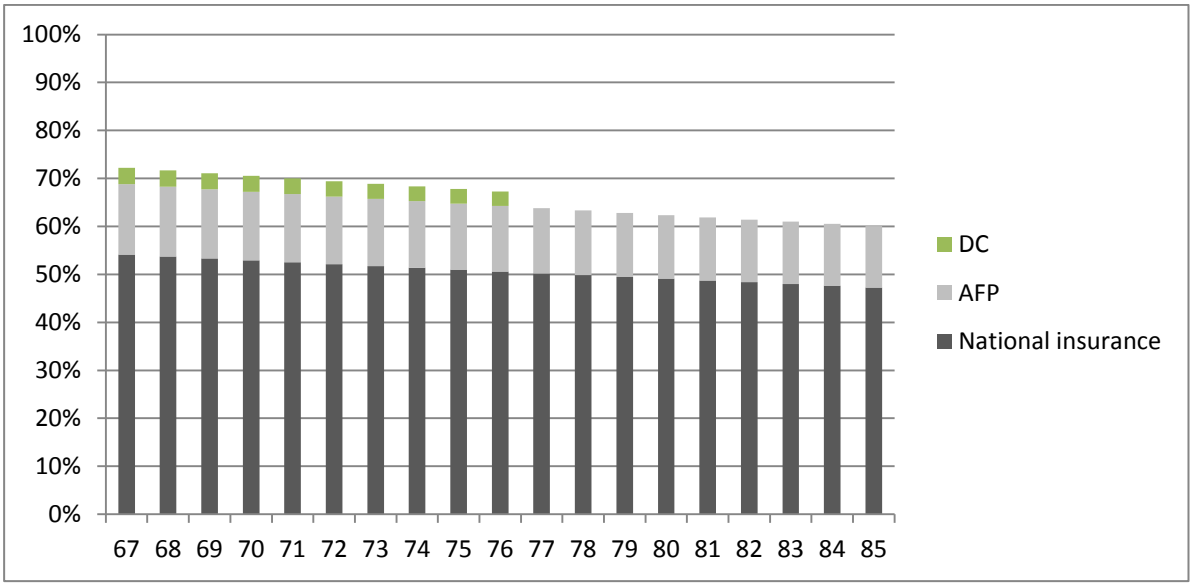
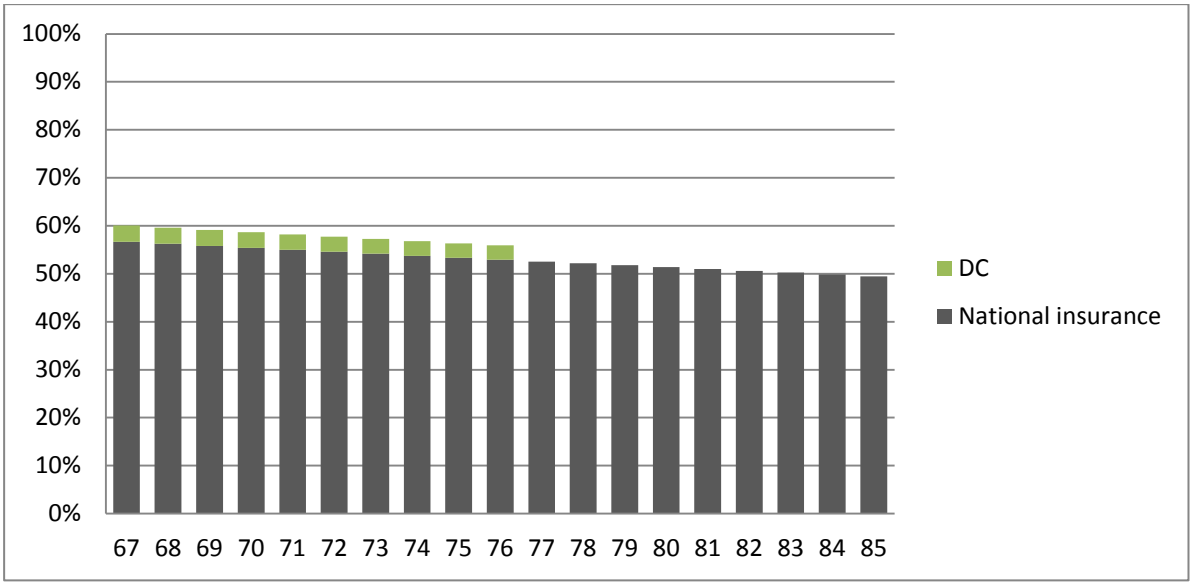


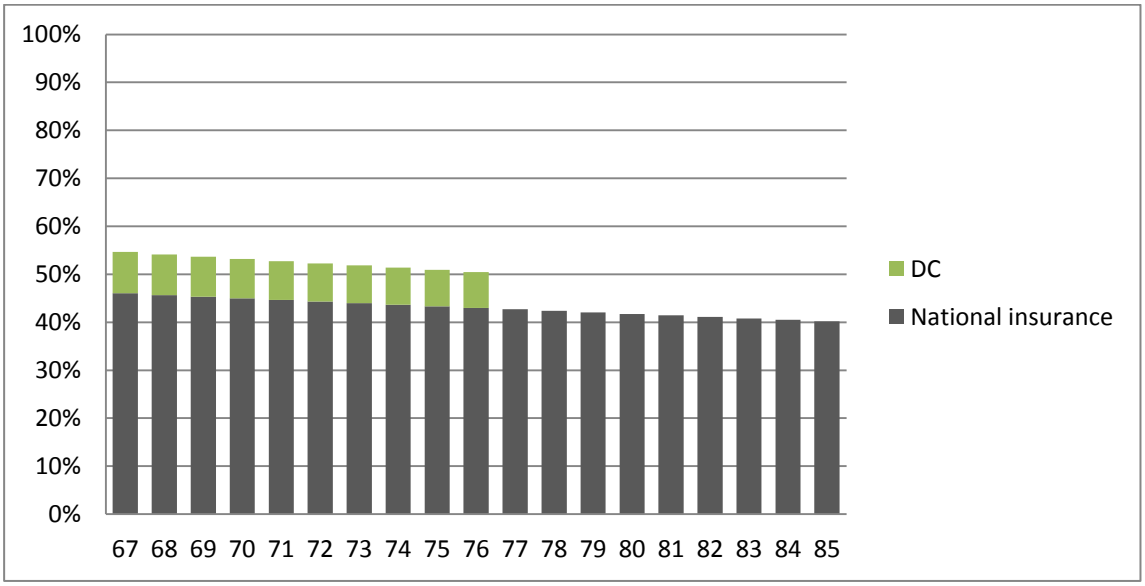
Figure 4.11 RR-life income average at 67 from 67 to 85 years. Born 1953. Private 3 group.



As can be seen in the figures presented here, terminating DC pensions could have an effect on the pension profile for the last group that combines national pensions with DC-pensions only. If one looks at younger age groups, this effect will be stronger because the DC-schemes have been in effect a longer time.

The following figure shows the pension profile when looking at the 1975 age group and not the ones born in 1953. This younger age group receives more from the occupational pension scheme. On the other side, life expectancy adjustment leads to reduced national insurance and reduced pension in total.

Figure 4.12 RR-life income average at 67 from 67 to 85 years. Born 1975. Private 3 group – national pension and DC-occupational pension.



Finally in this chapter we show the actual pension profile when withdrawal age is 62 years. Again we present the profile for persons born 1953 in the four subgroups. Lastly we present the same calculations for private sector with only DC pensions topping up the national pensions for persons born in 1975.

Figure 4.13 RR-life income average at 62 from 62 to 85 years. Born 1953. Public sector.

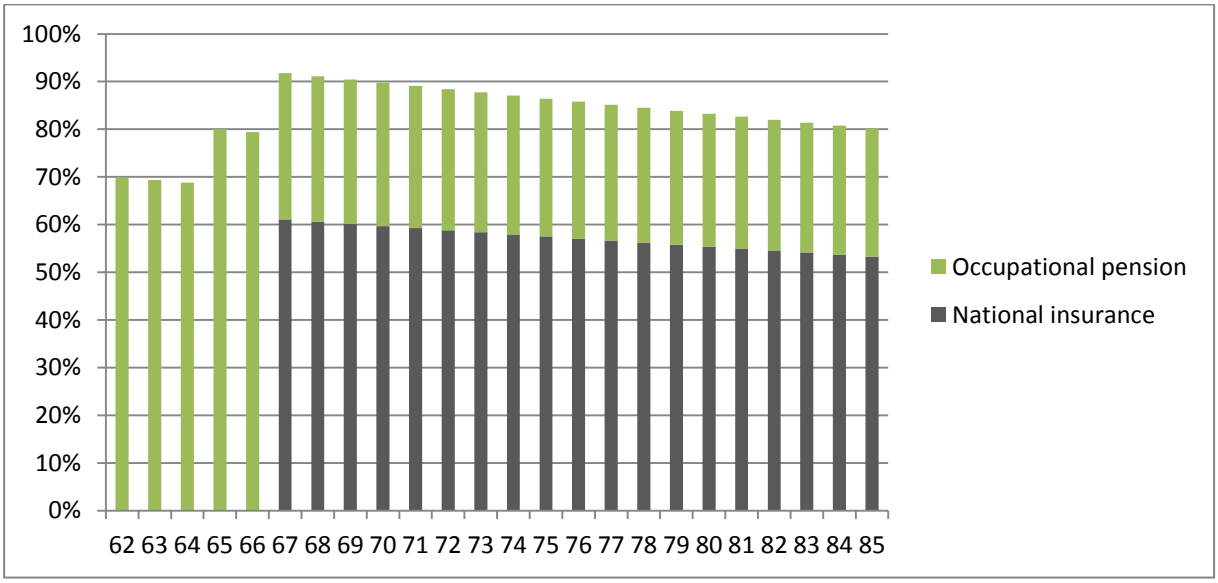


Figure 4.14 RR-life income average at 62 from 62 to 85 years. Born 1953. Private 1 group.

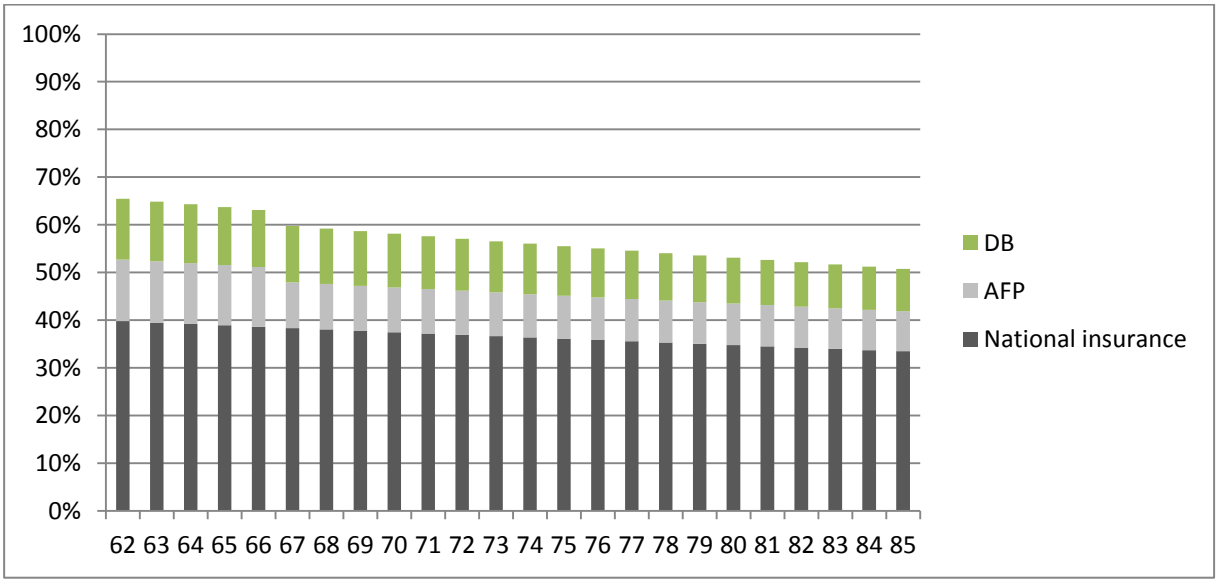


Figure 4.15 RR-life income average at 62 from 62 to 85 years. Born 1953. Private 2 group.

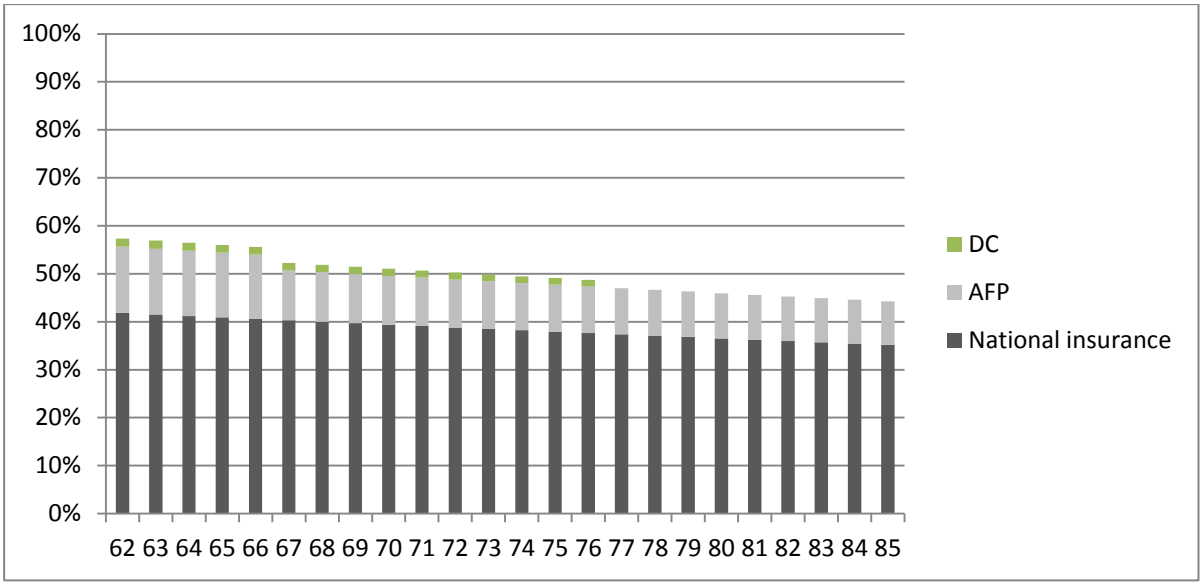
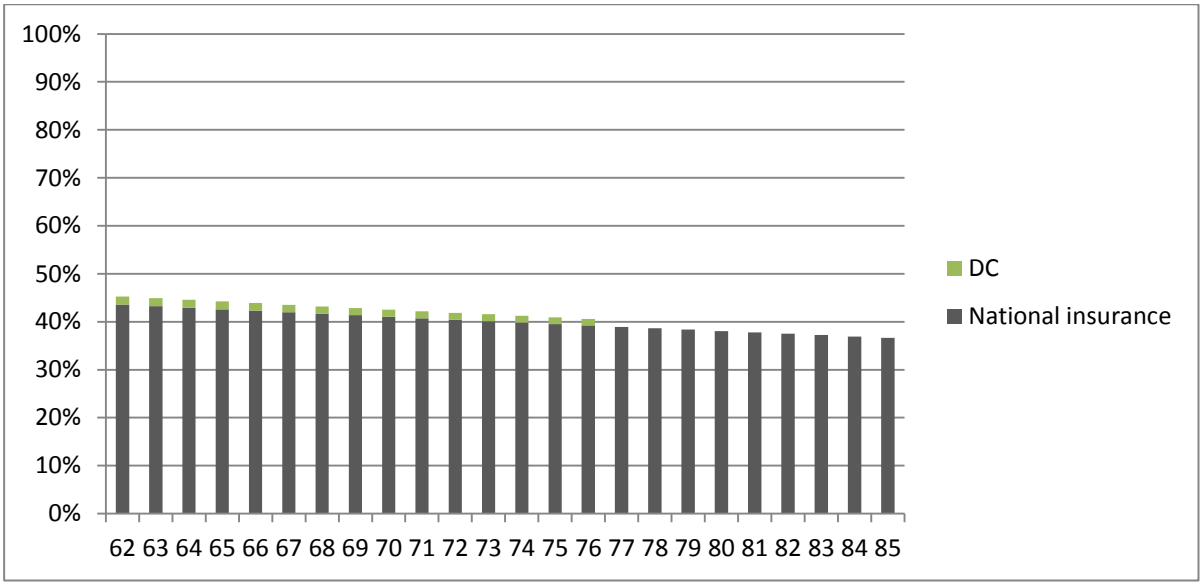
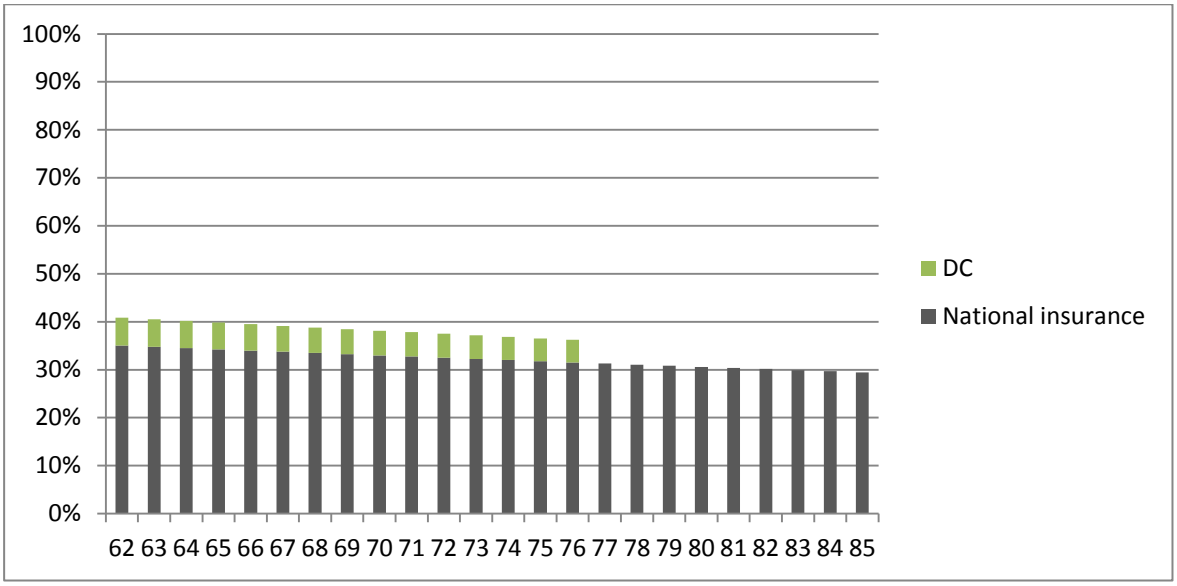


Figure 4.16 RR-life income average at 62 from 62 to 85 years. Born 1953. Private 3 group.



Last, we present the pension profile at labour market exit 62 years for «Private 3" persons born 1975 clearly showing the very low replacement rates that will be achieved at this exit age.

Figure 4.17 RR-life income average at 62 from 62 to 85 years. Born 1975. Private 3 group – national pension and DC-occupational pension.



Chapter 5 Variation in replacement levels labour market exit at 67

This chapter undertakes a detailed analysis of variations in replacement rates and other pension indicators by variables as age, gender, income, sector and industry. Secondly it looks at variation in income composition, i.e. pension accrual from the national system, the contractual labour market system and the occupational schemes. The third, and important ambition, is to make systematical comparisons across age groups. This is done by conducting separate estimates for persons born in 1953, 1965 and 1975.

These three age groups are selected in order to illustrate important differences in the conditions for pension accrual, first of all because of extended life expectancy. The oldest age groups (born 1953) has a relatively short time left before retirement is open to them and they are fully covered by the former national pension system and very insignificantly hit by mechanisms to reduce pensions due to longer life expectancy. The middle age group (born 1965) will have all their pension accrual in the new national pension system and represents the first cohorts acquiring pension rights in the new public as well as private pensions system. The youngest age group (born 1975) represents the younger age groups with significant higher life- expectancy also fully subject to new principles of pension accrual.

In the last section of this chapter we compare pension indicators across these three age groups. The following indicators are taken into consideration:

1. RR-LI. Replacement rate compared to average life long income
2. RR-FI. Replacement rate compared to final income
3. Pension ratio 1 – proportion with replacement rate (RR-LI) 2/3 or more
4. Pension ratio 2 – pension relative to average estimated population pension for persons born 1953
5. Pension in 2013 NOK

The main findings in this chapter are:

- There are significant differences in pension right accumulation between public and private sector employees. Public sector employees are well protected against reduction of income in old age when working until 67 years (as well as 65). This goes for all age groups, even though replacement rates will be reduced for the younger age groups also in the public sector.
- Private sector employees will see significant lower pension levels than public sector employees when working until 67 years. There are also distinct differences in pension accrual between private sector groups. This is due to differences in AFP-coverage as well as varying quality of occupational schemes. Many employees in retail, hotel and restaurants, energy and construction, real estate and other parts of private service industries will find themselves outside the AFP-system and only covered by a 2% DC occupational scheme. Even when

working until 67 years many will be far from a 2/3 replacement rate compared to their average life income.

- Low income individuals and women have higher replacements rates, but lower pension levels in absolute terms as compared to higher income individuals and men.
- Moreover, we estimate strong reductions in replacement rates among the younger age groups for all sectors and industries, gender and income levels. While the 1953 age group is very well (income) secured when entering the retirement phase, we find that persons born 1965 and 1975 will experience significant lower pension levels than the older age cohorts. Only one out of five private sector employees born in 1975 will see replacement rates of 2/3 or more at 67.
- Longer accumulation in DC plans for younger generations does not compensate for lower national pension benefits due to life expectancy adjustment
- In addition it should be underlined that reduced replacement rates hits two very different groups. On the one hand, low income groups, often women in private sector. On the other hand high income groups, often men found in sectors as oil and gas and financial services (but of course they have high absolute pension levels).
- Last, these findings indicate that there is a distinct individual saving need among several groups if working careers are not extended beyond the age of 67. An alternative to individual savings is converting reals estate or other wealth objects into pension income. One should however be aware that some of the groups with lower pension levels probably have less individual savings capacity and less private accumulated wealth than others.

5.1 A point of departure: Variation in replacement rates – population 35-61

This section serves as a starting point for the next section where we look at pension indicators in separate age groups. In this section the analysis in chapter four is taken a step further showing all the chosen indicators at labour market exit 67 years.

Table 5.1 shows the selected pension indicators at pension withdrawal 67 by industry and sector.

Table 5.1 Pension indicators by sector and industry. All 35 to 61. Labour market exit 67 years.

All	RR-FI Median/aver.	RR-LI. Median/aver.	Pension to average 1953-pension	RR-LI prop>2/3	Average pension in 2013 NOK	N
Public sector	66.3%/72.1%	76.8%/81.2%	93.0%	82.2%	320 996	49 312
Private sector	55.7%/58.5%	59.4%/61.3%	85.9%	31.1%	296 364	75 155
Oil, mining ..	58.6%/62.1%	60.2%/60.8%	133.1%	31.9%	459 138	2 929
Manufacturing	57.3%/59.6%	60.5%/61.1%	88.2%	29.6%	304 434	14 959
Construction, energy	54.6%/57.1%	56.9%/59.2%	85.2%	23.5%	294 129	8 152
Retail, hotel and restaurant	55.4%/58.9%	59.9%/62.9%	77.1%	33.4%	266 181	17 792
Transport and communication	55.7%/58.6%	59.6%/60.7%	84.8%	30.9%	292 630	7 846
Financial services	60.3%/61.5%	63.5%/62.4%	103.5%	41.8%	357 249	3 169
Real estate and other private services	52.4%/54.7%	54.7%/57.7%	85.3%	24.7%	294 258	13 667
Private health and educational services	57.5%/60.9%	64.7%/68.6%	73.7%	46.7%	254 344	4 172
Private personal services	59.1%/62.8%	63.4%/65.9%	85.7%	43.0%	295 684	2 469

Looking at the whole population from 35 to 61 as is done in table 5.1, given that they retire at 67 years, the maybe most striking feature is the difference between public and private sector employees. Over 80% of public sector employees in our data set will receive 2/3 or more of their average life income in yearly lifelong benefits. In private sector only 31% will find themselves in the same situation upon retirement with an average pension level (RR-LI) at 61%. This could of course be seen to serve as a sufficient income security in old age even though it is less than for public sector employees.

In private sector we also find large differences across industries varying from 54% (median RR-LI) to 65%.

Since very low income levels can achieve high replacement levels a more precise picture of what will be the expected pension levels for traditional working careers can be shown by calculating the same indicators for the (large majority) of employees with an income over life higher than 3.5 base amounts (G). Doing this replacement rates drops somewhat. Table 5.2 shows that private sector full time employees in average have a RR-LI at 57%. Only 23% will reach a pension level at 2/3 or higher of their previous life income.

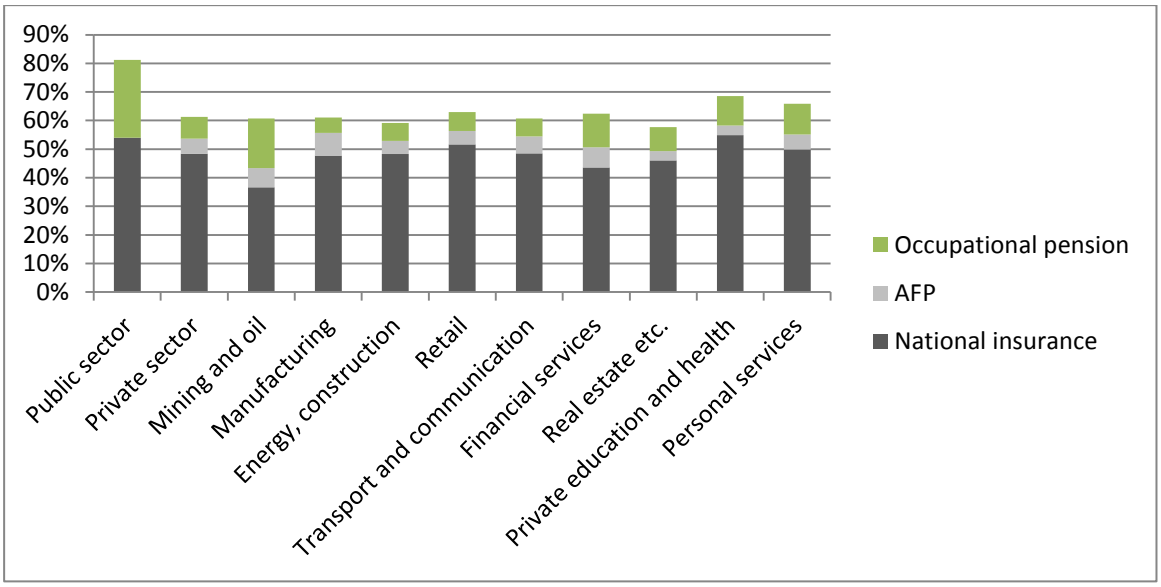
Table 5.2 Pension indicators by sector and industry. All 35 to 61 with income higher than 3.5G. Labour market exit 67 years

All	RR-FI Median/aver.	RR-LI. Median/aver.	Pension to average 1953-pension	RR-LI prop>2/3	Average pension in 2013 NOK	N
Public sector	65.6%/70.5%	74.1%/75.8%	101.3%	79.0%	349 455	38 324
Private sector	55.2%/57.2%	57.2%/57.4%	90.3%	23.3%	311 547	65 813
Oil, mining ..	58.4%/61.9%	59.9%/59.9%	134.6%	30.6%	464 446	2 869
Manufacturing	57.1%/59.0%	59.3%/58.5%	91.3%	23.8%	314 905	13 662
Construction, energy	54.7%/56.7%	55.7%/56.8%	87.9%	19.0%	303 180	7 542
Retail, hotel and restaurant	54.2%/56.5%	56.4%/57.2%	82.4%	21.1%	284 488	14 428
Transport and communication	55.4%/57.8%	57.8%/57.9%	87.8%	25.0%	303 107	7 104
Financial services	60.0%/61.1%	62.6%/61.0%	105.5%	39.4%	364 081	3 031
Real estate and other private services	51.7%/53.2%	52.6%/53.3%	89.4%	16.8%	308 488	12 055
Private health and educational services	55.8%/57.9%	59.7%/61.4%	80.6%	32.1%	278 162	3 041
Private personal services	58.5%/61.3%	61.2%/61.9%	91.4%	35.1%	315 445	2 081

Figure 5.1 shows the RR-LI indicator and the pension income composition. Hence, the pension accumulation is split between accrual in the national system, the contractual system and in occupational arrangements by sector and industry.

Figure 5.1 illustrates the nature of public private mix in the Norwegian system. First, it shows the overall importance of the national system for all sectors and industries. Second, one can see that contractual pensions as well as voluntary occupational schemes play a significant role, first of all in sectors with high levels of collective agreements and with more generous occupational arrangements.

Figure 5.1 Replacement rate (RR-LI) by income composition. All 35 to 61. 67 year exit.



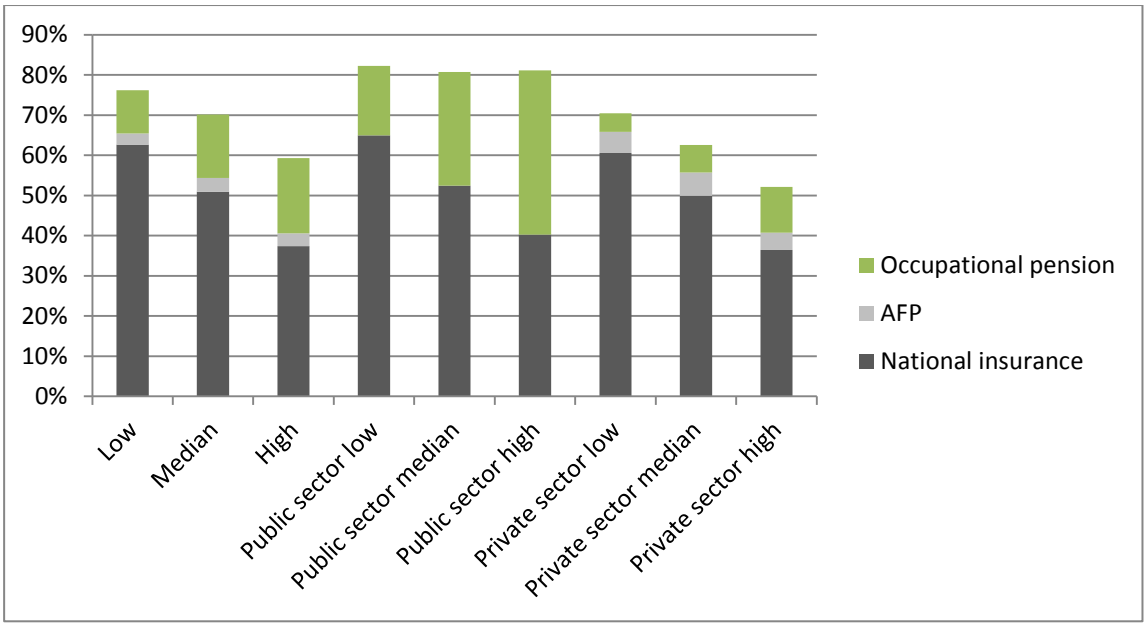
In table 5.3 the different pension indicators are broken down by income groups and by sector. We see distinct differences between public and private sector when it comes to the impact of income level on replacement rates. While 82% of high income employees in public sector will see 2/3 or more in RR-LI, this will only be the case for 18% of the private sector high income groups.

Table 5.3 Pension indicators by sector and income level. All 35 to 61. Labour market exit 67.

All	RR-FI Median/aver.)	RR-LI Median/aver.)	Pension to aver. 1953-pension	RR-LI prop>2/3	Average pension in 2013 NOK	N
Low	80.8%/92.1%	71.2%/76.2%	61.2%	59.6%	211 293	24 894
Median	61.3%/61.8%	67.5%/70.1%	86.5%	54.5%	298 535	74 679
High	45.3%/45.2%	56.0%/59.3%	122.8%	33.4%	423 716	24 894
Public sector low	80.7%/93.0%	78.3%/82.2%	63.0%	73.5%	217 481	12 054
Public sector median	64.9%/67.6%	76.3%/80.8%	93.4%	85.6%	322 355	31 127
Public sector high	59.1%/58.1%	77.9%/81.1%	150.0%	82.2%	517 615	6 131
Private sector low	80.9%/91.3%	64.5%/70.5%	59.5%	46.6%	205 485	12 840
Private sector median	56.9%/57.6%	61.0%/62.5%	81.6%	32.3%	281 510	43 552
Private sector high	40.6%/41.0%	50.2%/52.1%	113.9%	17.5%	393 034	18 763

In figure 5.2 we show the income structure by sector and income group. First of all it shows the great importance of national pension accrual for low income groups in private sector. It also shows that AFP even though is only covers around half of the private sector employees play an important role in pension accumulation.

Figure 5.2 Pension indicators. Replacement rate (RR-LI) by income structure and sector and pension income composition. Exit at 67 years.



In table 5.4 we have shown the selected pension indicators also broken down by gender and age as well as by sector. We find as expected that men will receive higher absolute pension payments. The replacement rate is however higher among women than men. Only 34% of men will see a replacement level of 2/3 or more compared to 70% among women.

Table 5.4 Pension indicators by sector and gender. All 35 to 61. Labour market exit 67 years

All	RR-FI Median/aver.	RR-LI Median/aver.	Pension to average 1953-pension	RR-LI prop>2/3	Average pension in 2013 NOK	N
Men	57.8%/59.8%	60.2%/61.3%	95.4%	34.1%	329 252	64 220
Women	64.3%/68.3%	74.2%/77.6%	81.6%	69.7%	281 469	60 247
Public sector men	64.9%/69.7%	71.1%/73.5%	108.3%	71.4%	373 679	15 042
Public sector women	66.8%/73.2%	80.1%/84.5%	86.3%	87.0%	297 872	34 270
Private sector men	54.4%/56.7%	56.5%/57.6%	91.5%	22.7%	315 663	49 178
Private sector women	58.3%/61.9%	64.9%/68.4%	75.3%	46.9%	259 829	25 977

5.2 Replacement rates – born 1953

With the analysis of all the age groups (35-61) as a point of departure we turn to the selected age groups to see the impact first of all of the reduction in pensions due to longer life-expectancies found in peoples pensions, AFP and in the private DC pension (as a systemic effect since they are from the outset terminating pensions).

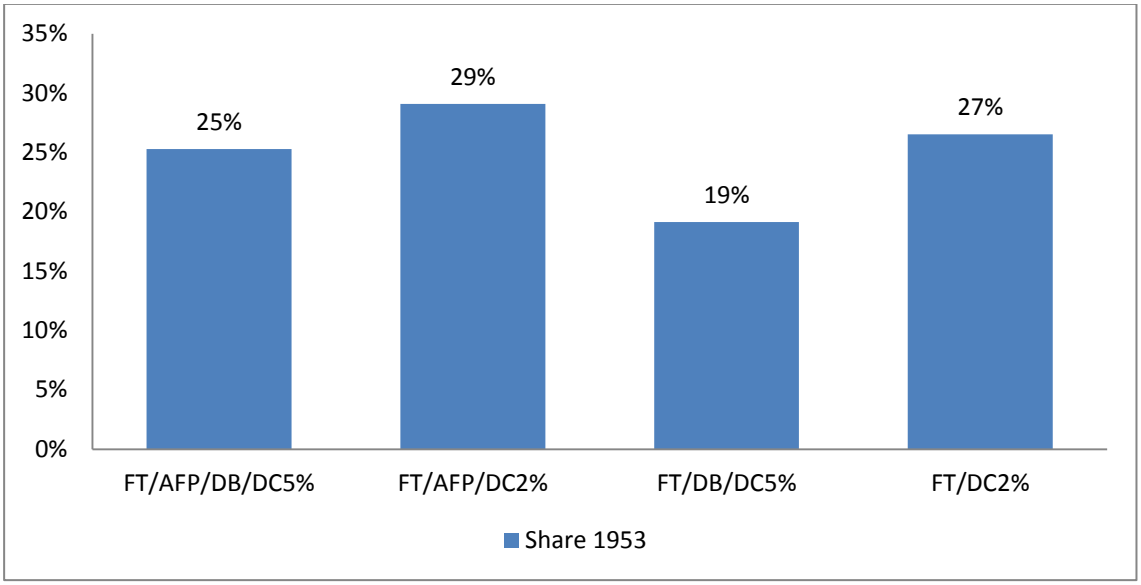
The specific pension accrual of the 1953 age group is however characterized by the fact that they are fully covered by the former national pension rules and only mildly subjected to reductions due to increased life-expectancy (the same in the AFP-scheme) and that they to a larger extent than younger people tend to work in companies with a collective agreement hence being member of the AFP-scheme. Looking at the pension packages of this age group we find therefore a higher DB-coverage and a higher AFP-coverage than what we showed for the total population in chapter 4 and that we will see for the younger age groups later in this chapter.

Table 5.5 Pension coverage persons born 1953

Benefit package: Sector or industry:	FT/ Afp, DB66	Ft/ AFP/ DB60	FT/ AFP/ DC2	FT/ AFP/ DC5	FT/ DB66	FT/ DB60	Ft/ DC2	Ft/ DC5	Sum
Public sector	0	0	0	0	100	0	0	0	100
Private sector	15	4	29	6	13	2	27	5	100
Oil, mining	75	7	0	9	5	4	0	0	100
Manufacturing	7	15	46	8	3	4	15	4	100
Construction, energy	16	0	30	1	12	0	38	2	100
Retail, hotel and restaurant	13	0	31	3	14	0	35	4	100
Transport and communication	12	0	36	2	15	0	32	2	100
Financial services	30	0	1	41	10	0	2	17	100
Real estate and other private services	11	0	17	3	24	0	37	7	100
Private health and educational ser–vices	14	4	11	2	28	7	27	7	100
Private personal services	29	6	24	6	10	4	16	6	100

In order to simplify one can regroup coverage into four different combination of pension coverage, what we have called pension packages. One out of four private sector employees in the oldest age groups are covered by both AFP as well as a relatively generous occupational scheme.

Figure 5.3 Percent covered by different pension packages. Private sector, born 1953.



In the following tables we have calculated the same pension indicators as we presented in section 5.1, but for the 1953 age group alone. These calculations show that this age group will have high and higher replacement levels than found in the total population.

First of all replacement rates are in this age group as most people would expect because there are only relatively mild life expectancy reductions to be found. Hence replacement rates among public sector employees relative to final income are around 68% and private sector employees significant lower at a median level of 60%.

Even so only 54% of private sector employees born in 1953 will reach a replacement rate relative to average life income of 2/3 or more. Public sector men will generate the highest absolute pension level even though replacement rates are somewhat higher among women.

Table 5.6 Pension indicators by sector and industry. Persons born 1953. Exit 67 years.

1953	RR-FI Median/aver.	RR-LI Median/aver.	Pension to average 1953-pension	RR-LI prop>2/3	Average pension in 2013 NOK	N
Public sector	68.3%/73.8%	85.5%/91.6%	102.7%	94.3%	354 508	1 850
Private sector	59.5%/61.6%	67.4%/69.5%	97.5%	53.8%	336 431	2 022
Oil, mining ..	55.9%/55.3%	63.5%/66.4%	164.4%	42.1%	567 137	76
Manufacturing	60.4%/62.2%	68.2%/68.6%	97.7%	55.9%	337 184	490
Construction, energy	59.9%/61.0%	64.3%/65.3%	96.2%	43.8%	331 807	201
Retail, hotel and restaurant	60.6%/64.7%	69.1%/73.5%	85.2%	58.0%	293 990	431
Transport and communication	57.8%/59.6%	67.7%/67.8%	96.8%	53.4%	334 181	253
Financial services	62.4%/63.6%	70.5%/72.5%	109.0%	67.6%	376 092	105
Real estate and other private services	54.5%/57.9%	61.0%/64.7%	100.6%	41.2%	347 255	306
Private health and educational services	61.7%/62.5%	76.3%/80.4%	78.7%	72.5%	271 567	109
Private personal services	66.5%/68.4%	71.8%/73.2%	105.9%	64.7%	365 471	51

Table 5.7 Pension indicators by sector and income. Persons born 1953. Exit 67 years

1953	RR-FI Final Median/aver.	RR-LI Median/aver.	Pension to average 1953-pension	RR-LI prop>2/3	Average pension in 2013 NOK	N
Low	81.3%/94.9%	89.6%/94.3%	64.2%	86.4%	221 572	583
Median	66.0%/67.0%	76.8%/80.7%	95.6%	78.6%	330 011	2452
High	52.0%/50.8%	64.8%/68.4%	137.7%	47.9%	475 198	837
Public sector low	82.1%/92.9%	97.9%/100%	65.3%	90.4%	225 328	342
Public sector median	67.9%/71.2%	84.0%/89.8%	101.4%	96.4%	349 950	1244
Public sector high	63.6%/62.6%	84.7%/89.6%	157.5%	89.4%	543 334	264
Private sector low	80.9%/97.9%	80.1%/86.2%	62.7%	80.9%	216 241	241
Private sector median	62.3%/62.6%	69.2%/71.3%	89.7%	60.3%	309 477	1208
Private sector high	44.7%/45.4%	57.3%/58.7%	128.6%	28.8%	443 806	573

Table 5.8 Pension indicators by sector and gender. Persons born 1953. Exit 67 years

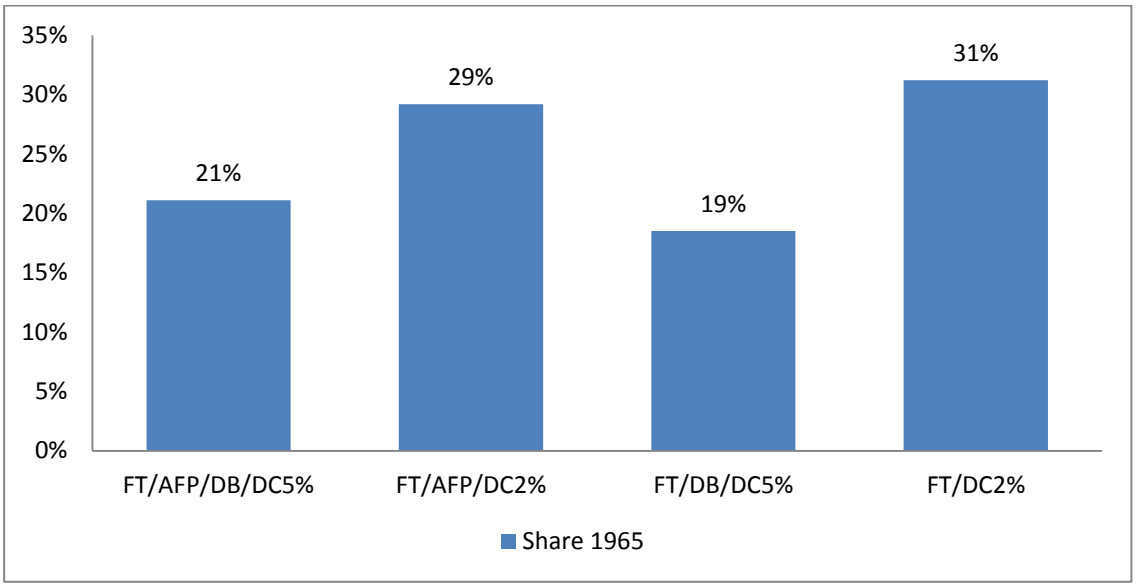
1953	RR-FI Median/aver.	RR-LI Median/aver)	Pension to average 1953-pension	RR-LI prop>2/3	Average pension in 2013 NOK	N
Men	62.3%/63.2%	68.1%/68.1%	110.4%	55.6%	381 051	1998
Women	67.5%/72.0%	88.1%/92.9%	88.9%	91.8%	306 704	1874
Public sector men	66.8%/71.6%	75.2%/79.0%	120.3%	88.1%	414 967	623
Public sector women	68.8%/75.0%	92.4%/98.1%	93.8%	97.4%	323 811	1227
Private sector men	58.0%/59.4%	62.8%/63.2%	106.0%	40.9%	365 684	1375
Private sector women	62.3%/66.3%	79.7%/83.0%	79.5%	81.3%	274 263	647

5.3 Replacement rates – born 1965

Turning to the younger age cohorts the pension picture changes quite strongly. Looking at the same pensions indicators for persons born in 1965 we see a shift in both coverage and the corresponding replacement levels.

As shown in figure 5.4 a higher percentage among the younger age groups are covered by only national pension and DC- 2% arrangements than fond among the older age groups (31 vs 27%).

Figure 5.4 Pension coverage in private sector by pension package. Born 1965.



Turning to the different pension indicators one can see significant reductions in pension levels. In table 5.9 the pension indicators are broken down by sector and industry. Among public sector employees born 1965 median RR-FI is down to 66% and to 56% among private sector employees. Only 30% of private sector employees will see a RR-LI higher than 2/3. In average pensions will be only 86% of the average pension level of persons born in 1953. Again there are differences across industries and in construction only 23% will have a RR-Li higher than 2/3 with a median RR-LI of 57%. Table 5.10 shows the indicators broken down by income groups and table 5.11 shows the indicators by sector and gender.

Table 5.9 Pension indicators by sector an industry. Persons born 1965. Exit at 67 years.

1965	RR-FI Median/aver.	RR-LI Median/aver.	Pension to aver. 1953-pension	RR-LI prop>2/3	Average pension in 2013 NOK	N
Public sector	66.1%/73.3%	75.8%/80.0%	92.6%	83.2%	319 404	2 008
Private sector	55.9%/58.4%	59.7%/61.4%	85.6%	29.7%	295 388	3 259
Oil, mining ..	56.4%/58.7%	58.8%/59.8%	131.8%	31.8%	454 945	110
Manufacturing	56.8%/60.1%	60.4%/60.6%	88.7%	25.5%	306 187	687
Construction, energy	54.2%/57.0%	57.3%/59.3%	86.0%	22.6%	296 612	359
Retail, hotel and restaurant	56.7%/59.4%	60.4%/62.4%	75.8%	31.5%	261 495	806
Transport and communication	56.0%/59.0%	58.7%/60.9%	84.2%	26.2%	290 598	347
Financial services	57.0%/57.8%	64.9%/60.6%	104.8%	46.9%	361 800	130
Real estate and other private services	52.0%/54.7%	55.3%/58.9%	85.6%	25.8%	295 324	539
Private health and educational services	57.3%/58.0%	64.7%/69.5%	75.4%	46.2%	260 310	169
Private personal services	61.0%/62.1%	65.2%/69.8%	87.9%	49.1%	303 419	112

Table 5.10 Pension indicators by sector and income. Persons born 1965. Exit at 67 years.

1965	RR-FI Median/aver.)	RR-LI Median/aver.	Pension to average 1953-pension	RR2 prop>2/3	Average pension in 2013 NOK	N
Low	81.2%/93.7%	70.9%/75.7%	62.2%	59.7%	214 792	1072
Median	61.1%/61.7%	66.7%/69.4%	86.0%	52.4%	296 866	3126
High	44.8%/45.1%	55.8%/58.6%	120.8%	33.8%	417 001	1069
Public sector low	82.6%/97.8%	77.9%/81.6%	64.7%	74.7%	223 408	506
Public sector median	64.5%/67.7%	74.9%/79.3%	92.6%	85.6%	319 614	1254
Public sector high	58.8%/57.5%	77.2%/80.3%	149.0%	87.9%	514 207	248
Private sector low	80.2%/89.8%	64.5%/70.4%	60.0%	46.3%	207 090	566
Private sector median	57.2%/57.8%	61.6%/62.8%	81.6%	30.1%	281 627	1872
Private sector high	40.9%/41.3%	50.3%/54.0%	112.3%	17.4%	387 638	821

Table 5.11 Pension indicators by sector and gender. Persons born 1965. Exit 67 years.

1965	RR-FI Median/aver.	RR-LI Median/aver.	Pension to average 1953-pension	RR2 prop>2/3	Average pension in 2013 NOK	N
Men	57.8%/60.5%	60.7%/61.6%	94.2%	33.6%	324 923	2738
Women	63.8%/68.0%	73.0%/76.0%	81.9%	67.9%	282 481	2529
Public sector men	65.1%/71.6%	71.2%/73.7%	106.4%	75.0%	367 094	657
Public sector women	66.5%/74.1%	78.5%/83.1%	85.8%	87.1%	296 212	1351
Private sector men	54.2%/57.0%	56.7%/57.8%	90.3%	20.6%	311 610	2081
Private sector women	58.8%/61.0%	64.6%/67.9%	77.3%	45.9%	266 732	1178

Taken together one can see that the 1965 age group:

Will have a pension level of 88% of what the 1953 age group will have when choosing a labour market exit at 67 years This is first off all due to the fact that the reductions of longer life-expectancy kicks in for this age group.

In public sector the income is 93% of the previous 1953 age group and public sector employees will have the highest pension levels. But, due to the reduced pensions when life expectancy increases public sector employees will y have around 66% of their final income as their yearly pension payments.

In private sector pension levels are significant lower. While 83% of the public employees are estimated to have 2/3 or more of their average life income in pension payments, only 30% of private sector employees will see a pension level of 2/3 or more. Among private sector employees born in 1965 the median RR-LI is down to 60%.

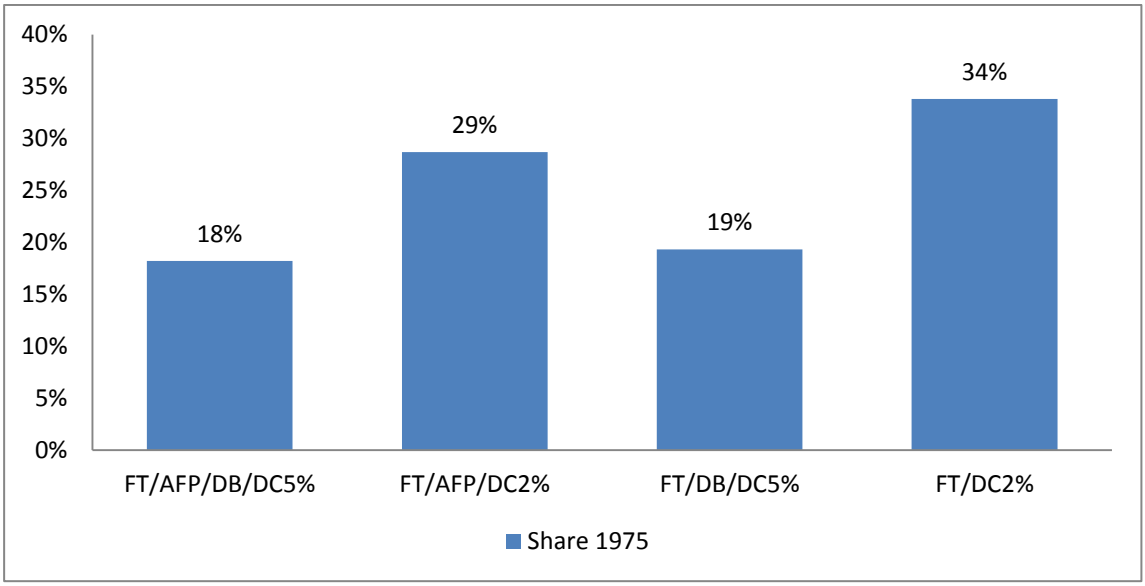
This indicates a strong economic push to extend working life among younger private sector employees after 67 years. A strikingly different situation is found among the public sector employees.

5.4 Replacement rates – born 1975

This section shows the same pension indicators as estimated for all, persons born in 1953 and in 1965, but here only for persons born 1975. As before the expected labour market exit is estimated to be at 67 years.

Figure 5.5 shows pension coverage among private sector employees. In this age group only 18% of private sector employees are found in the AFP and the more generous occupational scheme category. On the other hand 34% are not covered by AFP and at the same time are members of a 2% DC scheme. Among the youngest age group this is no the single largest group when it comes to pension coverage.

Figure 5.5 Pension coverage in private sector by pension package. Born 1975



In the three following tables – 5.12 to 5.14 – the selected pension indicators are shown broken down by sector, industry, income and gender. These tables show that the drop in pension levels continue because the life expectancy mechanism have an even stronger effect among persons born in 1975 than in 1965. The 1975 age cohort will in average have pension levels of 89 and 78% of what the 1953 cohort had. In private sector the median pension level is down to 56% of average life income. Compared to 60% among persons born 1965 i.e. only ten years earlier.

Table 5.12 Pension indicators by sector and industry. Persons born 1975. Exit 67 years.

1975	RR-FI Median/aver.	RR-LI Median/aver.	Pension to average 1953-pension	RR-LI prop>2/3	Average pension in 2013 NOK	N
Public sector	64.6%/70.7%	72.5%/74.7%	89.6%	73.0%	309 152	1 727
Private sector	54.2%/57.7%	56.2%/57.4%	78.6%	20.1%	271 181	3 033
Oil, mining ..	58.8%/62.1%	56.9%/56.6%	118.6%	20.4%	409 109	103
Manufacturing	56.4%/59.8%	57.5%/56.7%	81.2%	13.9%	280 362	505
Construction, energy	51.9%/54.9%	51.9%/53.9%	78.6%	11.3%	271 295	293
Retail, hotel and restaurant	53.0%/57.9%	56.7%/58.7%	73.1%	23.0%	252 144	793
Transport and communication	54.5%/57.8%	56.2%/56.2%	78.1%	17.5%	269 541	291
Financial services	62.0%/65.0%	61.5%/61.0%	93.2%	36.8%	321 543	125
Real estate and other private services	51.8%/53.6%	52.9%/55.0%	77.3%	17.5%	266 772	599
Private health and educational services	54.9%/58.1%	59.8%/63.5%	69.7%	32.6%	240 468	187
Private personal services	57.3%/62.5%	58.7%/61.1%	76.0%	30.7%	262 325	137

Table 5.13 Pension indicators by sector and income. Persons born 1975. Exit 67 years.

1975	RR-FI Median/aver.	RR-LI Median/aver.	Pension to average 1953-pension	RR-LI prop>2/3	Average pension in 2013 NOK	N
Low	78.5%/89.9%	65.1%/68.7%	58.1%	48.3%	200 452	1132
Median	58.3%/58.9%	62.1%/64.1%	82.2%	39.5%	283 781	2748
High	43.4%/43.4%	52.8%/55.6%	115.1%	27.2%	397 339	880
Public sector low	79.2%/91.5%	72.8%/74.0%	60.3%	65.3%	208 217	472
Public sector median	63.0%/65.9%	72.3%/74.7%	90.9%	77.0%	313 797	1025
Public sector high	57.0%/56.4%	72.8%/75.8%	143.6%	70.9%	495 589	230
Private sector low	78.1%/88.7%	60.9%/64.9%	56.5%	36.2%	194 898	660
Private sector median	54.0%/54.8%	57.2%/57.8%	77.1%	17.2%	265 924	1723
Private sector high	38.0%/38.8%	46.7%/48.5%	105.1%	11.7%	362 573	650

Table 5.14 Pension indicators by sector and gender. Persons born 1975. Exit 67 years.

1975	RR-FI Median/aver.)	RR-LI Median/aver.)	Pension to aver. 1953-pension	RR-LI prop>2/3	Average pension in 2013 NOK	N
Men	56.0%/59.2%	56.8%/57.8%	87.7%	23.1%	302 707	2 468
Women	61.8%/65.9%	68.3%/69.9%	77.0%	56.8%	265 845	2 292
Public sector men	63.3% 68.1%	67.8%/70.1%	102.8%	58.3%	354 773	537
Public sector women	65.1% 71.9%	75.0%/76.7%	83.6%	79.6%	288 565	1 190
Private sector men	53.3% 56.7%	54.1%/54.4%	83.5%	13.3%	288 228	1 931
Private sector women	56.0% 59.5%	60.2%/62.5%	69.9%	32.1%	241 311	1 102

Taken together, we see that the 1975 age group differs from both the 1953 and the 1965 age group:

Pension levels for public sector employees compared to what the 1953 age group will have are down to 88% for men and to 77% for women.

73% of public sector employees born in 1975 will have a pension of more than 2/3 of average life income. For the 1953 age group this was 94%. Only 58% of public sector men born in 1975 will have 2/3 or more of their average life income as pension payments.

Private sector employees born 1975 will see even lower pension levels than the public sector employees. When working to 67 years, only 13% of the men will see a pension level of 2/3 or more compared to their average life income. Among women 32% will have the same pension level.

For many private sectors employees born in 1975 they will have to extend their working careers if they plan to have pension levels of more than 50% of their previous average life income.

5.5 Comparing replacement rates across age groups

Based on the age specific calculations the main ambition of this chapter is to compare the pension indicator across the three age groups. In order to simplify somewhat we have chosen to focus the comparison on the replacement rate relative to average life income (RR-LI). We compare the RR-LI across sector, industry, income and gender. We do the comparison for all income groups as well as for those with a life income higher than 3.5 base amounts (G).

We will also show the income composition for each of the age groups showing the relative importance of national pensions, AFP and occupational pensions.

Figure 5.6 shows the RR-LI indicator broken down by sector and industry. In figure 5.7 the same brake down is done also showing the income composition.

Figure 5.6 pension indicators. Replacement rate RR-LI by sector and industry. 1953, 1965 and 1975 age group. Exit at 67 years.

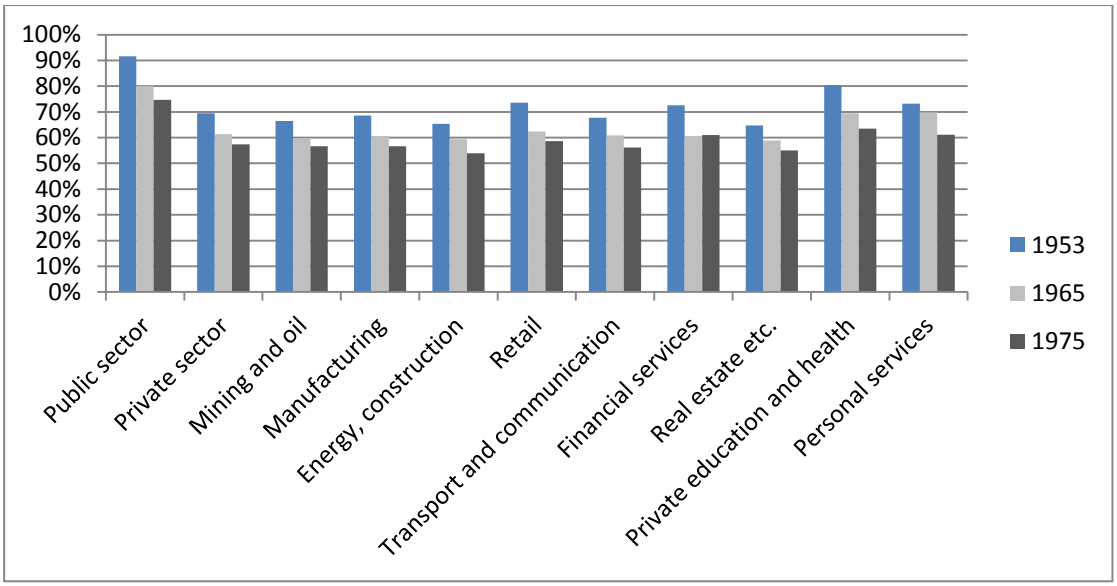
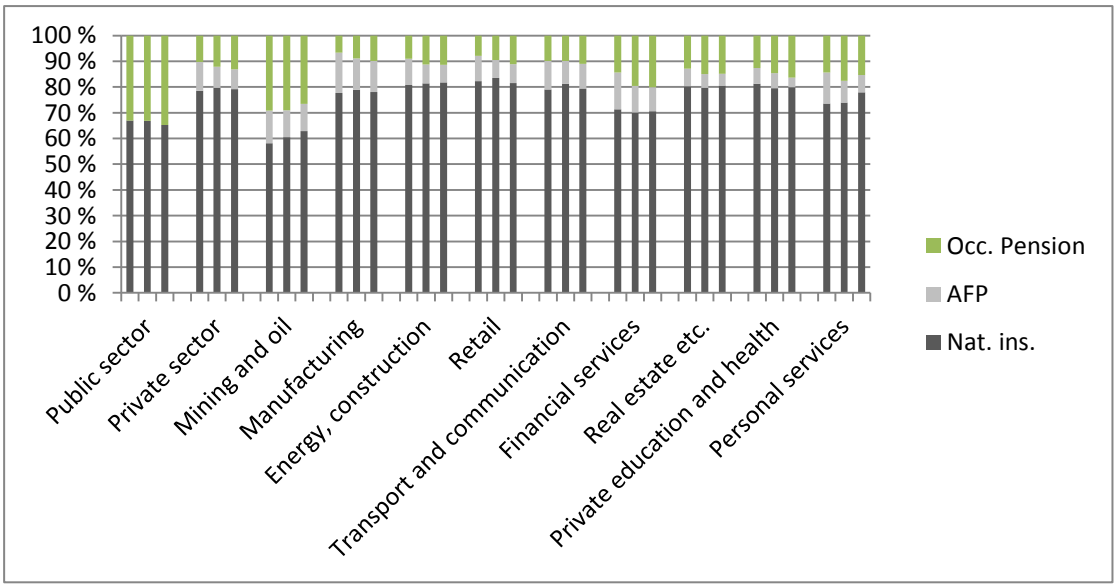
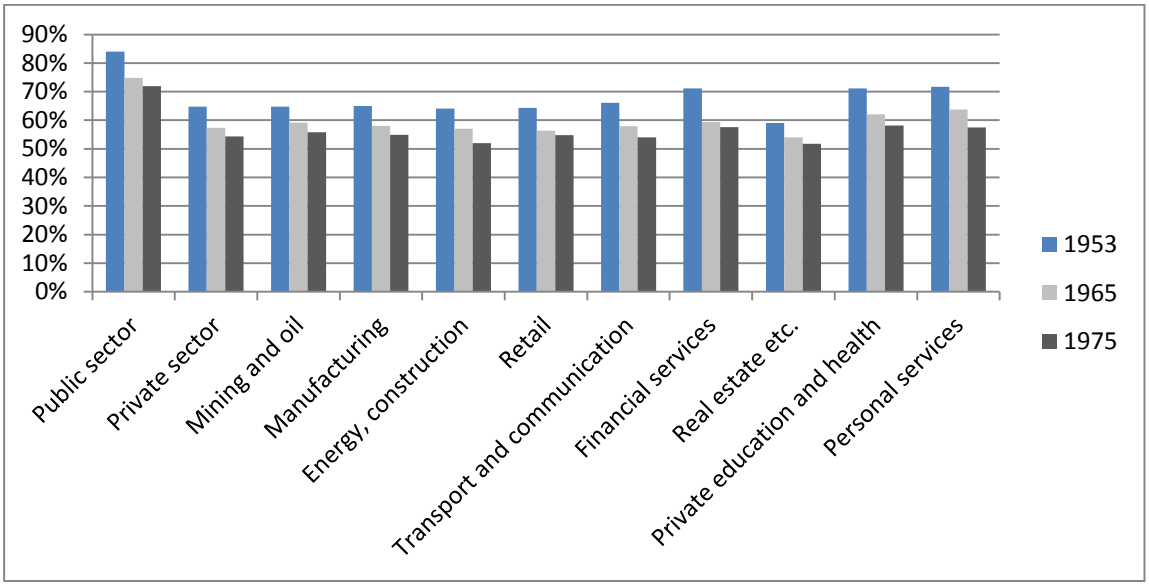


Figure 5.7 Pension indicators. Income composition of RR-Li. By industry. 1953, 1965 and 1975 age group. Exit at 67 years.



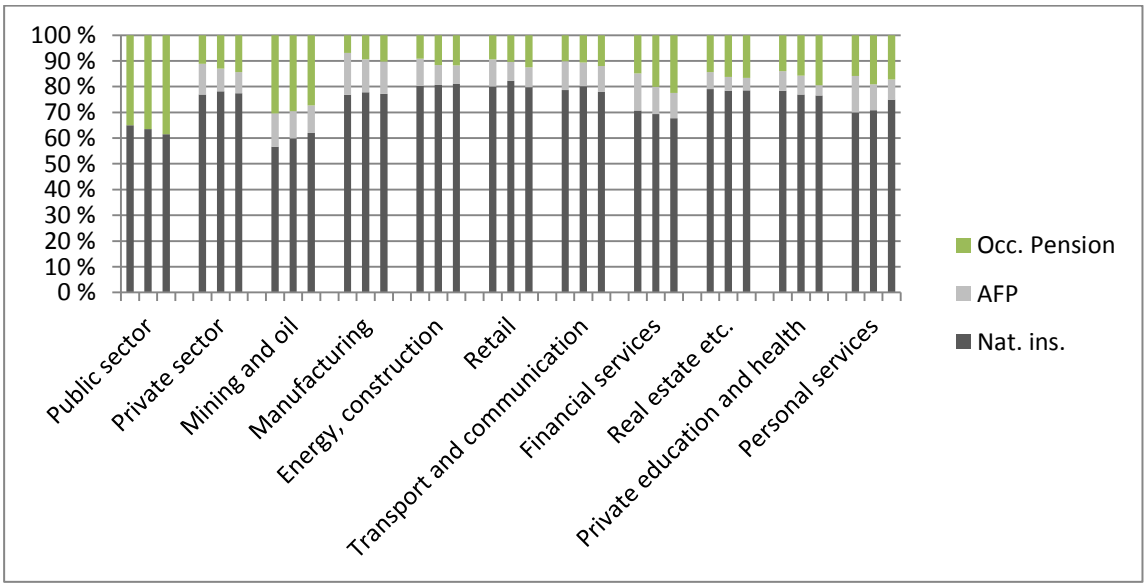
In the two following figures we have done the same calculations as over, but for those with an income over 3.5 base amounts (G). These figures show a somewhat lower pension level. In private sector the total average replacement rate for the 1975 age group is close to 50%.

Figure 5.8. Pension indicators. Replacement rate RR-LI by sector and industry. Income higher than 3.5G. 1953, 1965 and 1975 age group. Exit at 67 years.



When it comes to income composition one can see the growing importance of occupational pension because savings periods are becoming longer for the younger age groups. DC-schemes for the great majority of private sector employees were introduced as late as in 2006.

Figure 5.9. Pension indicators. Income composition of RR-LI by sector and industry and by income composition. Income higher than 3.5 G. 1953, 1965 and 1975 age group. Exit at 67 years.



Broken down by gender the same reduction in replacement rates become visible for both men and women.

Figure 5.10 Pension Indicators. Replacement rate RR-LI by sector and gender. 1953, 1965 and 1975 age groups. Exit at 67 years.

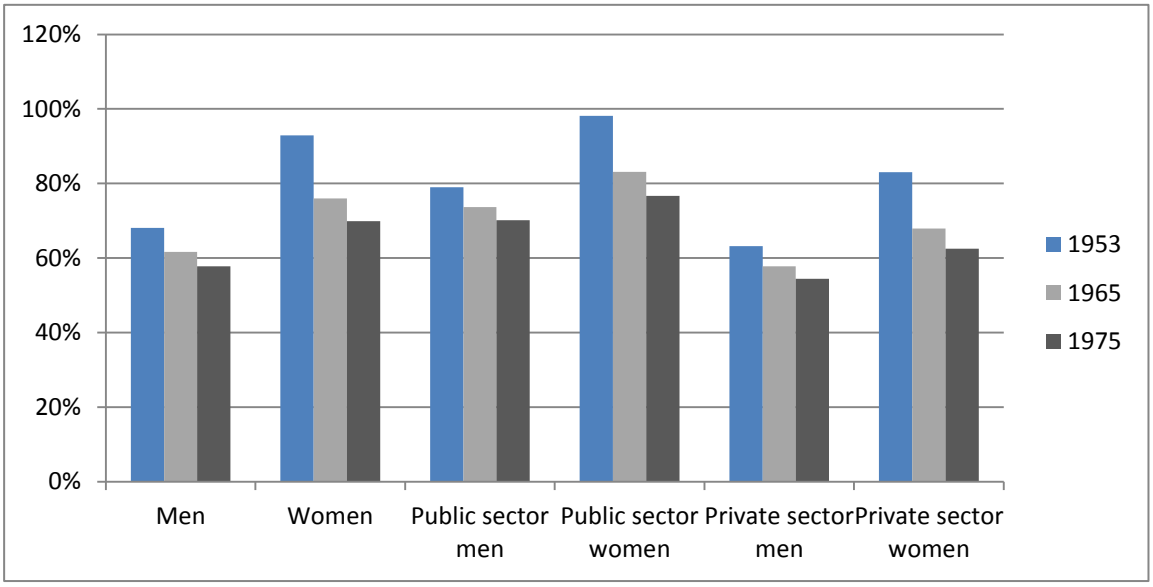
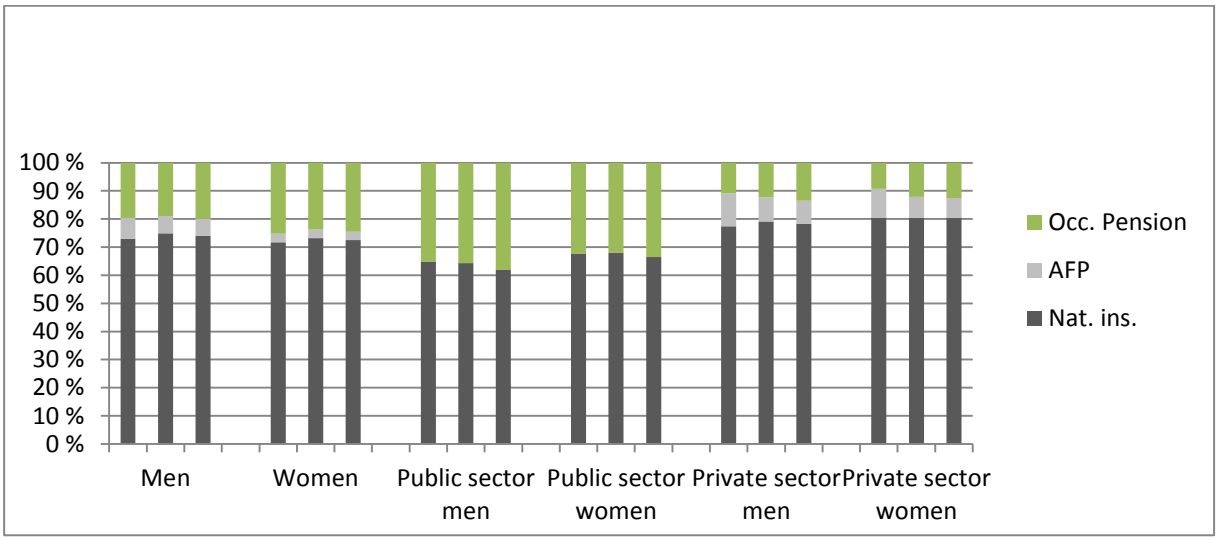


Figure 5.11 Pension indicators. Income composition of RR-LI by sector and gender and by income composition. 1953, 1965 and 1975 age groups. Exit at 67 years.



The last two figures show replacement rates and income composition by sector and by income group.

Figure 5.12 Pension indicators. Replacement rate RR-LI by sector and income group and by income composition. 1953, 1965 and 1975 age groups. Exit at 67 years.

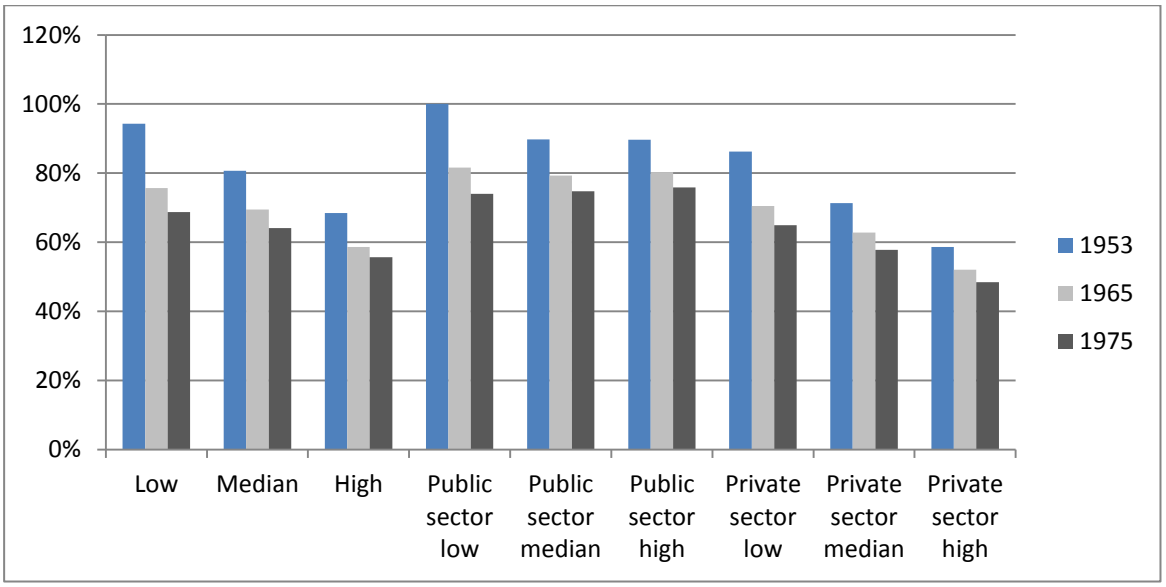
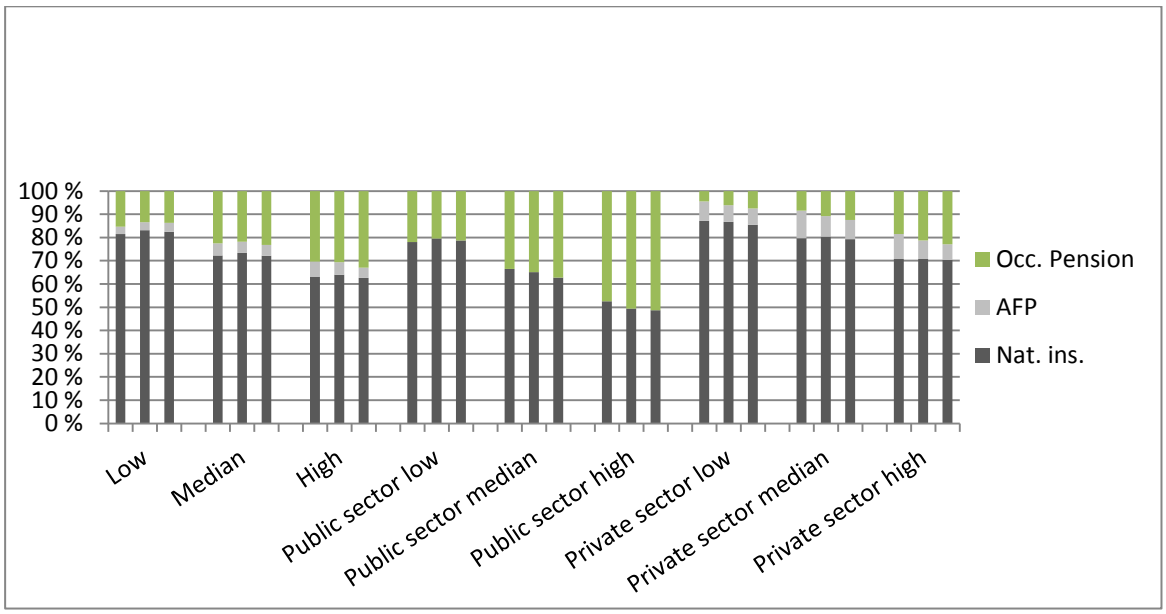


Figure 5.13 Pension indicators. Income composition of RR-LI by sector and income group and by income composition. 1953, 1965 and 1975 age groups. Exit at 67 years.



Appendix chapter 5

Table A5.1 Pension coverage persons born 1965

Benefit package: Sector or industry:	FT/ Afp, DB66	Ft/ AFP/ DB60	FT/ AFP/ DC2	FT/ AFP/ DC5	FT/ DB66	FT/ DB60	Ft/ DC2	Ft/ DC5	Sum
Public sector	0	0	0	0	100	0	0	0	100
Private sector	13	3	29	5	12	1	31	5	100
Oil, mining ..	62	7	0	12	14	4	0	2	100
Manufacturing	5	11	47	10	2	3	18	3	100
Construction, energy	13	0	29	1	13	0	41	3	100
Retail, hotel and restaurant	8	0	30	3	14	0	41	4	100
Transport and communication	14	0	37	2	11	0	34	3	100
Financial services	27	0	4	34	16	0	3	16	100
Real estate and other private services	12	0	18	2	19	0	42	8	100
Private health and educational ser-vices	14	4	17	4	21	5	27	10	100
Private personal services	21	9	22	5	18	5	16	4	100

Table A5.2 Pension coverage persons born 1975

Benefit package: Sector or industry:	FT/ Afp, DB66	Ft/ AFP/ DB60	FT/ AFP/ DC2	FT/ AFP/ DC5	FT/ DB66	FT/ DB60	Ft/ DC2	Ft/ DC5	Sum
Public sector	0	0	0	0	100	0	0	0	100
Private sector	10	2	29	6	12	1	34	6	100
Oil, mining ..	60	8	0	9	18	5	0	0	100
Manufacturing	4	10	49	10	2	3	20	3	100
Construction, energy	6	0	31	1	11	0	48	2	100
Retail, hotel and restaurant	10	0	31	4	11	0	40	4	100
Transport and communication	11	0	43	2	12	0	30	2	100
Financial services	24	0	2	38	9	0	1	27	100
Real estate and other private services	6	0	18	3	19	0	45	9	100
Private health and educational ser-vices	8	2	13	1	23	6	40	7	100
Private personal services	15	4	23	4	17	4	27	7	100

Chapter 6 Alternative scenarios for labour market withdrawal

This chapter introduces different labour market exits into the calculations of future pension levels. Along with the variances between age groups, actual labour market behavior is the most important factor to understand the distribution of future pension levels in Norway.

Our estimates and calculations have so far been based on the assumption that retirement happens at 67 for all. But, what will happen if people instead actually retire at different ages in the future? We have chosen 62 years as one illustration of early withdrawal from the labour market and 70 years as an illustration of the pension effect of extending the working career.

In this chapter we use the same pension indicator as shown in previous chapters:

1. RR-LI. Replacement rate compared to average life long income
2. RR-FI. Replacement rate compared to final income
3. Pension ratio 1 – proportion with replacement rate (RR-LI) 2/3 or more
4. Pension ratio 2 – pension relative to average estimated population pension for persons born 1953
5. Pension in 2013 NOK

The last section of this chapter compares the effects of withdrawal at 62, 67 and 70 years for these selected indicators.

The main findings of this chapter are:

- Relatively large groups will not qualify for pension withdrawal at 62 years. For the 1953 age group one out of five needs to earn more pensions rights in order to qualify for pension withdrawal. For persons born in 1975 one can expect that as many as three out of ten cannot qualify for exit at 62 years.
- Public employees will in average have relatively high pension levels even when retiring at 62 years. More than 80% will see a benefit level (RR-LI) 2/3 or more. This is a unique feature of the occupational pension system in the state and local sector.
- Only 7% of private employees will have accumulated a pension level of 2/3 or more if retiring at 62.
- For private sector employees retiring at 62 years replacement rates will become low, at 46% of life income and 44% of final income in average.
- Employees born 1975 will only achieve a slightly higher pension level than the 1953 cohort did at 62 if they work until 70 years. That clearly illustrates the effect of the life-expectancy

mechanism built into both state and occupational pension plans. However, among private sector employees working until 70 years will increase pension levels significantly. Turning to private sector employees the pension rewards are high when extending the working careers. The younger age groups in private sector will find themselves at a pension level equal to what the 1953 group had at 67 when working until 70 years.

- The effect of extending working life varies across pension packages (coverage) and this offers a clear picture of pension winners and looser. If working until 70 even younger age groups covered by AFP and a good occupational scheme can reach pension levels of 80% of average life income. On the other hand, for those who are covered by only national pensions and DC2% schemes in the same age groups an extension of working life until 70 years will still leave them with pension levels under 60%.
- When working until 70 years the huge differences between public and private sector employees are reduced significantly due to the higher pension return for private sector workers when extending their careers. Private sector workers exiting at 70 years can receive nearly the same pension levels as public employees if they are covered by AFP and are member of a relative generous occupational arrangement.
- The higher replacement rates found among women in total stems from a combination of a large proportion of women working in public sector and a lower average income level than men.

6.1 Retirement at 62

A first relevant question when looking at labour market withdrawal at 62 is who can actually take advantages of this opportunity of early labour market exit. The minimum requirement to allow pension withdrawal is a yearly pension level from national pensions system[11] alone or national pension and AFP[12] (if covered) together that exceeds the current minimum pension level of 2 G[13]. This minimum level is, however, gradually adjusted down by the life expectancy development.

In table 6.1 we show the proportion of different age groups with a yearly pension higher than the required limit to retire with national insurance and AFP at 62.

Public sector employees cannot receive early retirement pension from their employer along with national insurance. They are however, covered by a separate plan from 62 to 65/67 offering pensions at a level corresponding to the old national pension system. The public sector figures are even so shown in the table as a reference point for the private sector calculations showing

[11] To make the testing of qualification independent of marital status, in the testing, each person's national insurance pension is calculated as if the person was single (with the highest level of minimum pension) irrespective of the person's actual marital status. However, if the requirements are met, the actual national insurance being paid out may depend on marital status.

[12] Only the main part of the AFP benefit is included, not the 19 200 fixed addition payed out from 62 till 67 nor the compensation amount,

[13] This corresponds to the minimum pension at age 67 for single people.

what would have been the case if public sector employees had been subject to the same regulation as private sector employees. For the private sector employees the story is also different as they can combine pension income with work income.

Table 6.1 Percent of selected age groups that qualify for pension withdrawal at 62.

	% with pension above requirement	% men with pension above requirement	% women with pension above requirement
All – 35 – 61	62.0%	81.1%	41.7%
Public sector	40.4	68.2%	28.1%
Private sector	76.2%	85.0%	59.6%
Born 1953	74.6%	94.3%	53.6%
Public sector	64.6%	91.8%	50.8%
Private sector	83.8%	95.5%	59.0%
Born 1965	59.3%	77.0%	40.1%
Public sector	34.6%	60.0%	22.2%
Private sector	74.5%	82.4%	60.5%
Born 1975	57.8%	75.2%	39.1%
Public sector	34.7%	56.4%	25.0%
Private sector	71,0%	80.4%	54.4%

Our estimates indicate that relatively large groups will not qualify for pension withdrawal at 62 years in private sector, especially among women. For the 1953 private sector age group nearly 20% needs to earn more pensions rights. For persons born in 1975 one can expect that around 30% cannot qualify. As already pointed to, 45% of younger women will not qualify for pension withdrawal at 62.

If public sector workers had been subjected to the same qualifying rules as private sector workers a majority of women born 1965 and 1975 would not have qualified. This illustrates the more generous early retirement system in place in the public sector.

This is of course an interesting and relevant empirical finding. It is however open for discussion whether this constitutes a social policy problem. In the old national pension system there were no early retirement possibilities before 67 years. The new minimum pension age of 62 must not necessarily be seen as an entitlement to retire, but as an opportunity if pension accumulation is high enough.

In table 6.2 we have collected some indicators in order to understand why so many women will not qualify. One feature is that these are women with a high number of years with very low income. In average the group of non-qualifiers has more than 30 years with low income (1G or 2G). In addition they are as a main rule not covered by the contractual AFP-arrangement as also shown in table 6.2 for different industries.

Table 6.2 Women in private sector with pension accrual less than minimum requirement at 62. Selected indicators of employment careers.

	All	1953	1965	1975
N	10 503	265	465	503
Average yearly life income	293 591	225 285	297 663	314 281
Average number of years with income 1G+/2G+	35.2/31.5	30.9/26.2	35.5/31.8	36.5/33.2
AFP-coverage in:				
Private sector	17.0%	34.7%	14.0%	11.9%
Oil, mining	28.6%	NA	0.0%	33.3%
Manufacturing	32.4%	48.8%	16..3%	19.4%
Construction, energy	10.7%	16.7%	11.1%	14.3%
Retail, hotel and restaurant	20.1%	40.0%	16.8%	16.1%
Transport and communication	27.1%	41.7%	20.0%	20.0%
Financial services	22.4%	44.4%	16.7%	35.7%
Real estate and other private services	12.5%	32.4%	14.4%	3.0%
Private health and educational services	7.0%	11.6%	5.7%	3.4%
Private personal services	10.4%	0.0%	0.0%	12.5%

Pension indicators at 62 year exit – public sector

This section looks at the various pension indicators if all public employees actually chose to exit at 62 years. Even though the pension profile will vary between 62 and 65/67 and after 67 the estimates are based on the recalculated equal yearly lifelong pension. In other words, this is not the actual first year payment, but the average life long equalized first year payment when starting withdrawal at 62 years. This is done in order to compare across sectors and industries.

Table 6.3 shows that, in average, public employees will have relatively high life long pension levels even when retiring at 62 years. More than 80% will see a benefit level relative to their life income of 2/3 or more. Even the 10% with the lowest replacement rate compared to

life income (RR-LI) show a replacement rate of 61% and of 57% compared to final income. The last row shows the calculated actual pension payed out at 62. This is the early pension from the occupational scheme, calculated as national insurance under "old rules" as if retirement was at 67, plus an additional fixed amount of 20 400 NOK (discounted down to 2013 value from retirement year by growth in G). The average RR-LI for the first year pension is 63% and 59% for >3.5 G average earners.

Table 6.3 Pension indicators. Public sector. Withdrawal at 62

	Public employees at 62 Median/Average	10% min	10% max	Standard deviation	N
RR-LI. Average life income	Median: 77.5% Average: 80.7%	61.2%	104.2%	18.9%	49 312
RR-FI. Final income.	Median: 66.4% Average: 72.2%	56.6%	93.0%	24.2%	48 146
Pension ratio: RR-LI prop>2/3	83.1%	NA	NA	NA	49 312
Pension ratio: Pension/ average future pension 1953	Median: 100.8% Average: 106.3%	65.3%	157.2%	35.7%	49 312
Average future pension in 2013 NOK/G	Median: 303 034 Average: 319 747	196 399	472 737	107 403	49 312
First year pension in 2013 NOK/G	Median: 249 489 Average:242 700	172 340	301 423	52 020	49 312

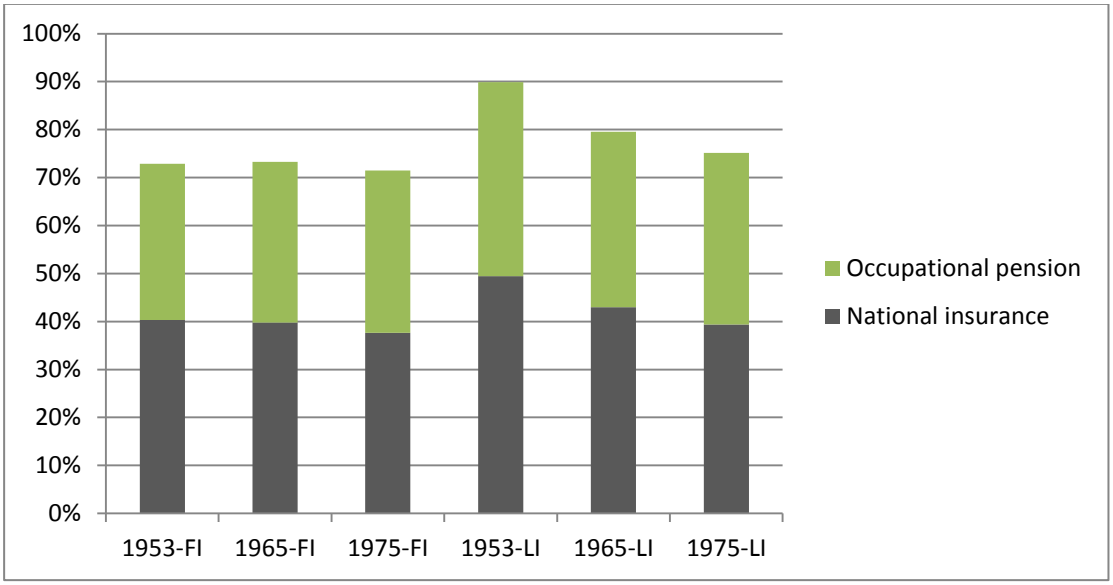
In table 6.4 the same indicators are shown for public employees with income levels over 3.5G. By removing low income earners replacements rates become lower. Even so also among the more regular basically full time public employees replacement levels are high.

Table 6.4 Pension indicators. Public sector. Withdrawal at 62. Income above 3.5 G.

	Public employees at 62 Median/Average	10% min	10% max	Standard deviation	N
RR-LI. Average life income	Median: 74.7% Average: 75.9%	59.4%	93.7%	14.4%	38 324
RR-FI. Final income.	Median: 65.9% Average: 70.8%	56.7%	88.6%	22.8%	38 033
Pension ratio: RR-LI prop>2/3	80.0%	NA	NA	NA	38 324
Pension ratio: Pension/average future pension 1953	Median: 109.7% Average: 116.0%	79.8%	167.4%	33.8%	38 324
Average future pension in 2013 NOK/G	Median: 329 969 Average: 349 021	239 981	503 500	101 550	38 324
First year pension in 2013 NOK/G	Median: 263 453 Average:262 737	218 402	308 178	35 716	38 324

If we compare the effect of early exit across different age groups one will, again, see that pension levels will decrease significant for the younger age groups. The figure shows the two pensions indicators (RR-FI and RR-LI) for persons born 1953, 1965 and 1975.

Figure 6.1 Pension indicators RR-Fi and RR-LI by age group in public sector. Exit at 62 years.



Pension indicators at 62 year exit – private sector

Turning to private employees the picture looks very different from what we found among public sector workers when it comes to pension accumulation at 62 years. In private sector AFP-coverage is crucial for the 62 year total pension level, as well as the large differences found in occupational pension coverage. For employee groups outside the AFP plan the pension level at 62 year exit drops to 42%, indicating that many private sector employees will see relatively low pension levels if retiring at 62. The results in the following tables for retirement in private sector at 62 show the pension level at this age for all employees, not considering if they are entitled to take out their pension at this age or not. It shows the pension accrued at this age. Restricted to the 76% of the private sector employees that are eligible to take out their pension at this age, the RR-LI is even lower, 47% for employees with AFP and 37% for employees outside AFP. Their average total pension is about 246 000 NOK while the average pension accrued for the non-qualified is 154 000 NOK. For all private sector employees, as shown in table 6.6, the accrued pension at 62 is in average 221 000 NOK.

Table 6.5 Replacement rate relative to average life income (RR-Li) in different pension arrangements. Private sector with and without AFP- coverage. Average for all age groups. Labour market withdrawal at 62 years.

	With AFP	No AFP
FT (RR-LI)	35.96%	36.47%
AFP (RR-LI)	8.14%	0,00%
TP (RR-LI)	5.68%	5.60%
Private sector RR	**49.78%**	**42.07%**

Table 6.6 sums up the different indicators calculated at 62 years work withdrawal for private sector employees. Only 7% of private employees will have a pension level of 2/3 or more if retiring at 62. Replacement rates will become as low as 46% of life income and 44% of final income (median value). In the following table 6.7 the same indicators are shown for person with life income over 3.5G taking replacement rates a step down.

Table 6.6 Pension indicators at labour market exit 62 years. Private sector employees.

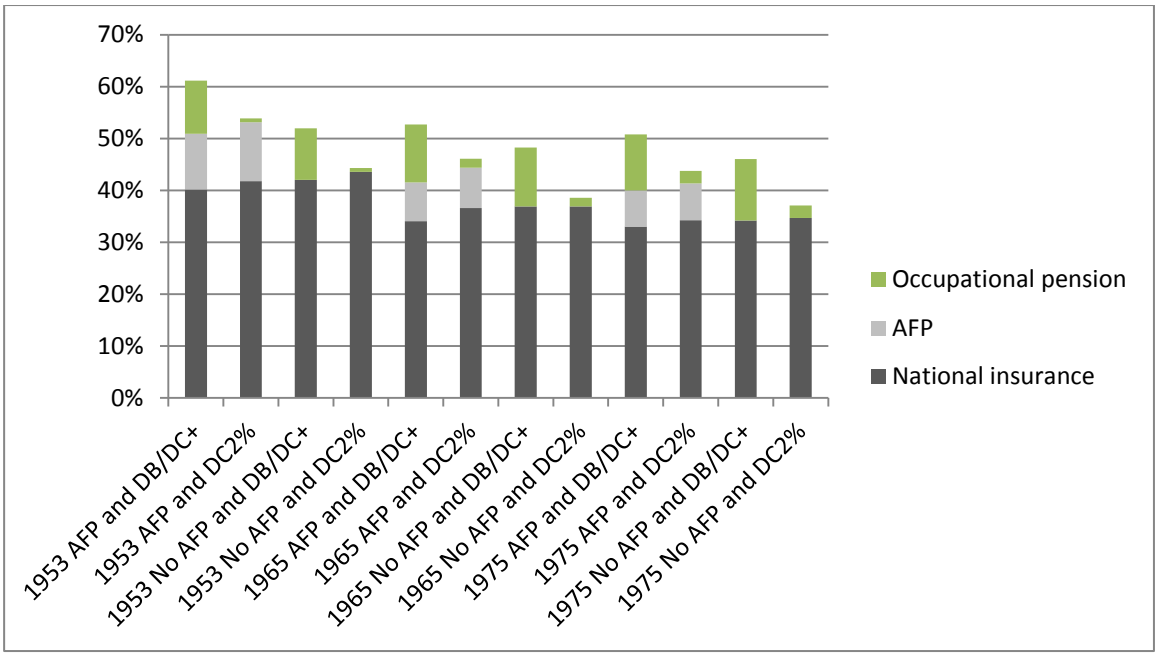
	Private employees at 62 Median/Average	10% min	10% max	Standard deviation	N
RR-LI. Average life income	Median: 44.4% Average: 45.9%	31.7%	61.2%	14.1%	75 155
RR-FI. Final income.	Median: 41.3% Average: 44.0%	26.1%	61.8%	19.4%	73 558
Pension ratio: RR-LI prop>2/3	6.6%	NA	NA	NA	75 155
Pension ratio: Pension/average future pension 1953	Median: 69.0% Average: 73.5%	47.5%	103.3%	24.1%	75 155
Average future pension in 2013 NOK/G	Median: 207 640 Average: 220 973	142 734	310 623	72 454	75 155

Table 6.7 Pension indicators at labour market exit 62 years. Private sector employees with income over 3.5G.

	Private employees at 62 Median/Average	10% min	10% max	Standard deviation	N
RR-LI. Average life income	Median: 42.8% Average: 42.8%	30.8%	54.8%	9.9%	65 813
RR-FI. Final income.	Median: 40.9% Average: 42.9%	25.4%	59.0%	18.3%	65 121
Pension ratio: RR-LI prop>2/3	1.4%	NA	NA	NA	65 813
Pension ratio: Pension/average future pension 1953	Median: 72.3% Average: 77.0%	52.4%	106.7%	23.6%	65 813
Average future pension in 2013 NOK/G	Median: 217 358 Average: 231 638	157 530	320 766	70 871	65 813

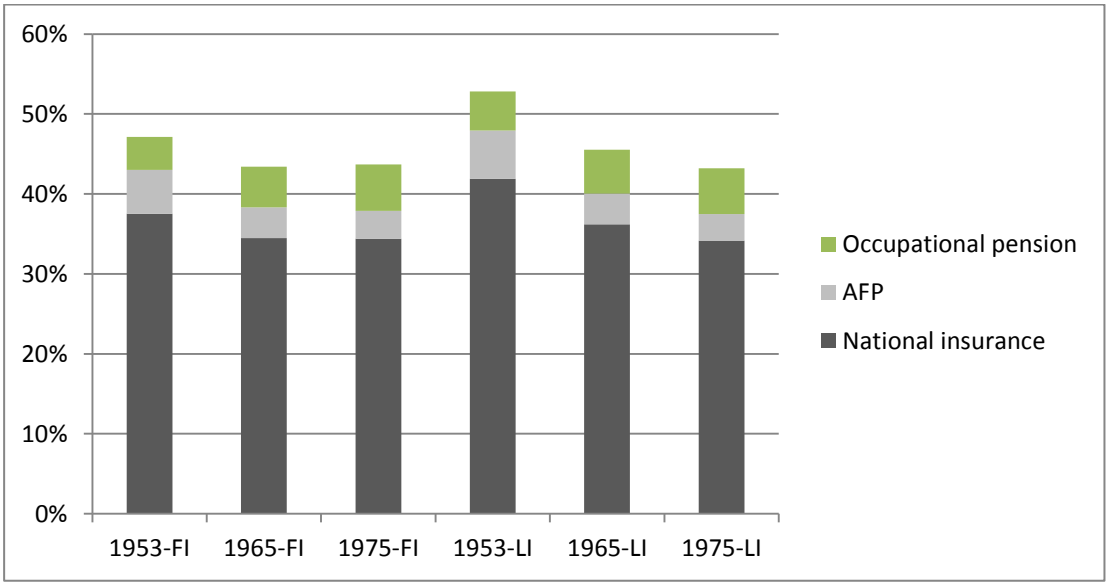
The underlying structure of private pension accrual is shown in figure 6.2 where the life-long income replacement rate is shown broken down by age and pension packages (coverage). One can see that while coverage by only national pension and DC2% offers the 1953 age group a replacement rate a bit over 50%, the 1965 and 1975 age groups will see pension levels under 40% if retiring at 62.

Figure 6.2 RR-LI and pension income composition by age and pension package coverage. Private sector. Labour market exit at 62 years.



When comparing the effect of early exit across different age groups in private sector one finds strongly decreasing pension levels. Figure 6.3 shows the two pensions indicators for individuals born 1953, 1965 and 1975. Not surprisingly the life extension effect will make it impossible for large groups of the younger age cohorts to withdraw at 62 years.

Figure 6.3 Pension indicators RR-Fi and RR-LI by age group in private sector



Summing up pension effects at 62 year exit

The replacement rate level (RR-LI) and income composition at labour market exit 62 years in public and private sector are summed up in table 6.8. The table shows the pension indicators by different pension packages (coverage). We have chosen to present both all income groups as well as employees with income over 3.5 G.

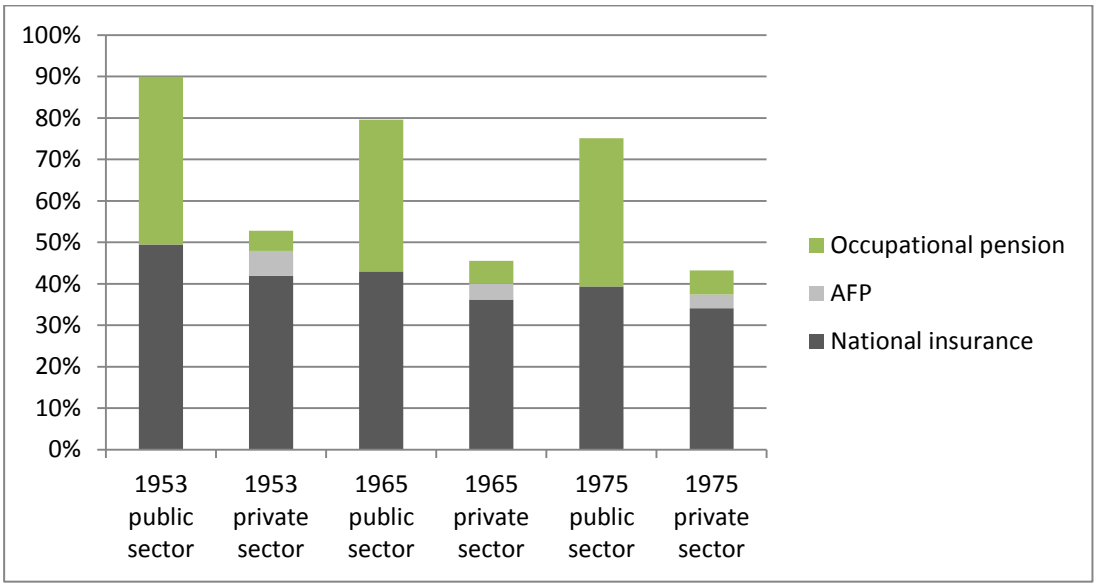
As shown in table 6.8, among individuals with income over 3.5 G the average replacement rates varies from 76% among public sector employees to 35% among the private sector employees only covered by DC2% occupational schemes.

Table 6.8 Pension levels by sector and pension coverage. Age 35 to 61. Exit at 62. All income groups and person with income over 3.5 G.

	Percent of employees	RR-LI at 62 – average/median	Average yearly pension 2013 Nok
Public sector employees	All: 40 3.5 G+: 37	All: 80.7(=43.4+0+37.2)/77.5% 3.5 G+: 75.9(=38.4+0+37.5)/74.7%	All: 319 747 3.5 G+: 349 021
Private sector employees with AFP and DB/DC+	All: 13 3.5 G+: 14	All: 53.9(=35.0+8.0+10.8)/52.3% 3.5 G+: 51.3(=32.7+7.9+11.1)/51.3%	All: 281 254 3.5 G+: 293 924
Private sector employees with AFP and DC2%	All: 17 3.5 G+: 18	All: 46.6(=36.7+8.2+1.7) /45.4% 3.5 G+: 43.4(=33.6+8.1+1.7) /44.6%	All: 216 796 3.5 G+: 225 883
Private sector employees outside AFP DB/DC+	All: 12 3.5 G+ : 12	All: 47.6(=36.2+0+11.4)/45.3% 3.5 G+: 44.3(=32.5+0+11.8)/43.8%	All: 231 635 3.5 G+: 245 218
Private sector employees outside AFP and DC2%	All: 18 3.5 G+: 19	All: 38.5(=36.7+0+1.8)/36.8% 3.5 G+: 34.8(=33.0+0+1.8)/36.0%	All: 174 865 3.5 G+: 181 962

In figure 6.4 we show the life income replacement rate (RR-LI) by age and sector. The huge difference between public and private sector is clearly shown. Persons born 1965 and 1975 in private sector will achieve replacement rates in average of around 40% opposed to the older age groups with pension levels at 50% of previous life income.

Figure 6.4 Pension indicator RR-LI and pension income composition by age and sector.



6.2 Pension indicators at 70 years

In this section we turn to the effect on pension levels when working careers are extended to 70 years. These calculations are based on both the recorded income data and the future estimated income. The TRIM model estimates however, relatively low income levels at 70 and the last years before 70. These income estimates are based on the actual income of previous cohorts. Nevertheless, one can argue that labour market behavior will change and income levels move upwards in the future. This can happen as an effect of increased educational levels in the population as well as a result of new pension arrangements offering a higher pension return when extending work careers. On the other hand one might see that many who choose to work longer will combine work and pension and thereby reduce the income that generates pension accumulation at the end of their working careers. In this case the anticipation of reduced income closer to retirement can be a more accurate assumption.

Taken together, these calculations of pension indicators at 70 do offer a good estimate of what will happen when contributing periods grow and payment periods are reduced. On the other hand, the effects will be higher if actual income at the end of the working career will increase more than estimated in the TRIM model.

Pension indicators at 70 year exit – public sector

In table 6.9 and 6.10 we show the selected pension indicators for public sector employees when retiring at 70 years. The indicators are shown for all income groups as well as for individuals with income over 3.5 G. Due to the nature of the occupational pension plan in public sector which guaranties 66% of final income after 30 years, pension levels do not grow much when labour market withdrawal is extended. Some persons will however achieve a full membership period of 30 years after 67 years of age.

Table 6.9 Pension indicators. Public sector. Withdrawal at 70

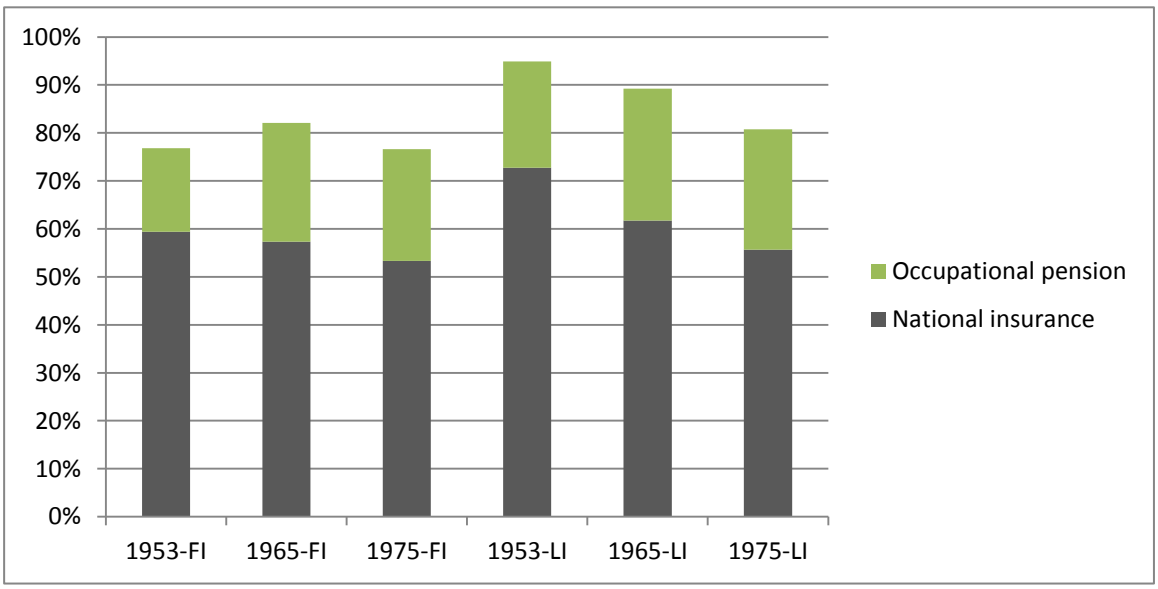
	Public employees at 70 Median/Average	10% min	10% max	Standard deviation	N
RR-LI. Average life income	Median: 83.2% Average: 88.2%	68.5%	113.8%	21.7%	49 312
RR-FI. Final income.	Median: 72.0% Average: 78.8%	60.5%	102.1%	27.6%	48 146
Pension ratio: RR-LI prop>2/3	93.2%	NA	NA	NA	49 312
Pension Ratio: pension/average future pension 1953	Median: 83.7% Average: 90.9%	59.3%	136.0%	30.5%	49 312
Average future pension in 2013 NOK/G	Median: 320 777 Average: 348 202	227 297	521 241	116 688	49 312

Table 6.10 Pension indicators. Public sector. Withdrawal at 70. Above 3.5 G LI.

	Public employees at 70 Median/Average	10% min	10% max	Standard deviation	N
RR-LI. Average life income	Median: 80.0% Average: 81.9%	67.0%	99.3%	14.5%	38 324
RR-FI. Final income.	Median: 71.2% Average: 76.7%	60.3%	96.4%	25.4%	38 033
Pension ratio: RR-LI prop>2/3	91.3%	NA	NA	NA	38 324
Pension ratio: - pension/average future pension 1953	Median: 91.2% Average: 98.7%	68.1%	145.5%	29.6%	38 324
Average future pension in 2013 NOK/G	Median: 349 395 Average: 378 215	260 930	557 648	113 516	38 324

In figure 6.5 we compare the two pension indicators across age groups. One can see that the younger age groups are hit by reduced benefit levels due to increased life expectancy.

Figure 6.5 Pension indicators RR-Fi and RR-LI at 70 by age group in public sector



Pension indicators at 70 year exit – private sector

Opposed to what we find among public sector employees, benefit accrual rules in private sector plans produced relatively large pension increases when working until 70 years.

As shown in table 6.11, one can see that among AFP-covered employees the replacement rate increases to 78%. 56% of this pension comes from national pension accumulation, 13% from AFP and 9% from occupational schemes.

Among those not covered by collective agreements the national pensions system offers a replacement rate of 57% and the occupational programs 9% producing a total pension level of 66%.

Table 6.11. Replacement rate relative to average life income (RR-LI) in different pension arrangements. Private sector with and without AFP- coverage. Average for all age groups. Labour market withdrawal at 70.

	With AFP	No AFP
FT (RR-LI)	56.02%	56.79%
AFP (RR-LI)	12.75%	0,00%
TP (RR-LI)	9.10%	8.97%
Private sector RR	**77.87%**	**65.76%**

Table 6.12 and 6.13 sums up the different indicators calculated at 70 years work withdrawal for private sector employees for all income groups and for those with income over 3.5 G.

Table 6.12 Pension indicators at 70 years exit. Private sector employees.

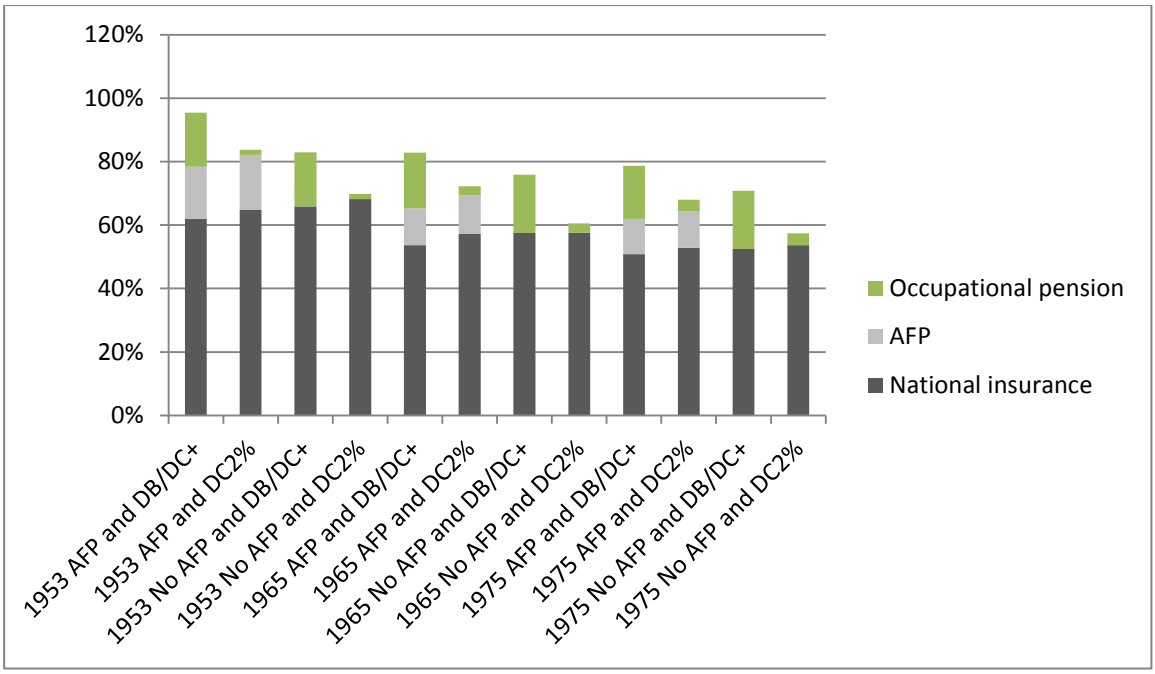
	Private employees at 70 Median/Average	10% min	10% max	Standard deviation	N
RR-LI. Average life income	Median: 69.0% Average: 71.8%	49.3%	95.8%	22.9%	75 155
RR-FI. Final income.	Median: 64.2% Average: 68.8%	40.8%	96.5%	31.1%	73 558
Pension ratio: RR-LI prop>2/3	57.7%	NA	NA	NA	75 155
Pension ratio: Pension/average future pension 1953	Median: 85.0% Average: 90.0%	58.1%	125.3%	29.5%	75 155
Average future pension in 2013 NOK/G	Median: 325 876 Average: 344 980	222 688	479 997	113 103	75 155

Table 6.13 Pension indicators at 70 years exit. Private sector employees. Income higher than 3.5G.

	Private employees at 70 Median/Average	10% min	10% max	Standard deviation	N
RR-LI. Average life income	Median: 66.4% Average: 66.8%	48.0%	85.8%	15.8%	65 813
RR-FI. Final income.	Median: 63.4% Average: 66.9%	40.0%	92.2%	29.5%	65 121
Pension ratio: RR-LI prop>2/3	51.1%	NA	NA	NA	65 813
Pension ratio: Pension/average future pension 1953	Median: 89.0% Average: 94.3%	64.3%	129.0%	28.8%	65 813
Average future pension in 2013 NOK/G	Median: 340 842 Average: 361 485	246 199	494 398	110 534	65 813

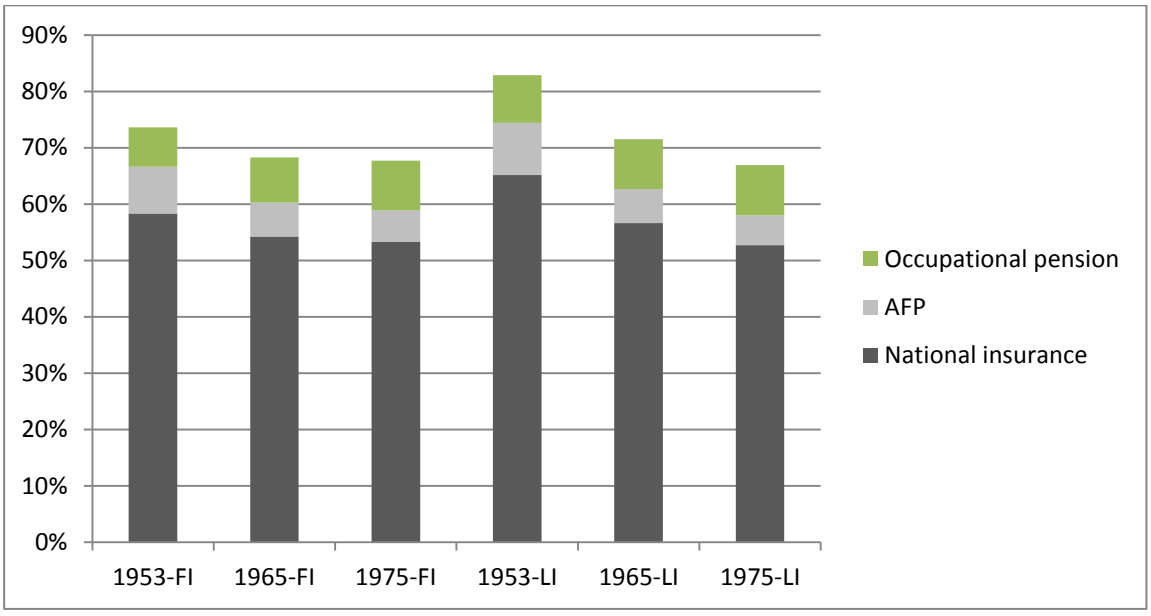
Figure 6.6 shows the underlying coverage structure generating the different pension levels at 70 years labour market exit.

Figure 6.6 Pension indicators RR-LI and pension income composition by age and pension package coverage. Private sector. Labour market exit at 70 years.



In figure 6.7 we compare the two pension indicators by age group. As can be seen the younger age groups will see significant reduced pension levels because of life-expectancy reductions. The 1975 age cohort can in average see a replacement rate compared to life-income of around 2/3 if they work until 70 years. In other word, working careers must be extended for many employees in tomorrow's labour market.

Figure 6.7 Pension indicators RR-Fi and RR.LI by age group in private sector. Exit 70 year.



Summing up pension at 70 year labour market exit

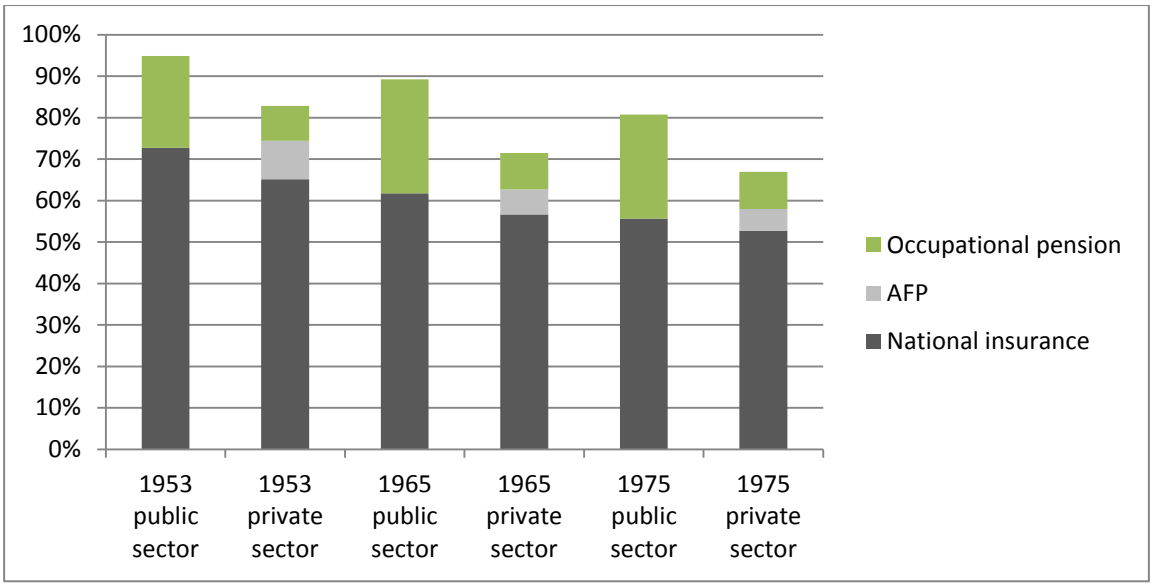
Taken together the replacement rate structure in public and private sector is summed up in table 6.14. If everyone works until 70 the huge differences between public and private sector employees are reduced significantly due to a higher pension return for private sector workers when extending their careers. Private sector workers can receive the same pension levels as public employees if covered by AFP and are member of a relative generous occupational arrangement. Even the 18% of our sample that only find themselves covered by a DC2% scheme can achieve pension levels up to 60% (54% with income 3.5G+).

Table 6.14 Pension levels by employment group. Age 35 to 61. Exit at 70.

	Percent of employees	RR-LI at 70 – average/median	Average yearly pension 2013 Nok
Public sector employees	All: 40 3.5 G+: 37	All: 88.2(=62.6+0+25.6)/83.3% 3.5 G+: 81.9(=55.2+0+26.8)/80.0%	All: 348 202 3.5 G+: 378 215
Private sector employees with AFP and DB/DC+	All: 13 3.5 G+: 14	All: 84.3(=54.6+12.5+17.2)/81.4% 3.5 G+: 79.9(=50.5+12.1+17.3)/79.9%	All: 437 784 3.5 G+: 456 765
Private sector employees with AFP and DC2%	All: 17 3.5 G+: 18	All: 72.9(=57.1+12.9+2.9) /70.9% 3.5 G+: 67.8(=52.5+12.5+2.9) /69.3%	All: 338 699 3.5 G+: 352 754
Private sector employees outside AFP DB/DC+	All: 12 3.5 G+: 12	All: 74.4(=56.4+0+18.0)/70.5% 3.5 G+: 69.1(=50.8+0+18.3)/68.3%	All: 361 254 3.5 G+: 382 111
Private sector employees outside AFP and DC2%	All: 18 3.5 G+: 19	All: 60.1(=57.1+0+3.0)/57.6% 3.5 G+: 54.6(=51.5+0+3.1)/55.9%	All: 273 946 3.5 G+: 285 520

By using only the RR-Li indicator figure 6.8 looks at pension income composition and pension level for the three different age groups – 1953, 1965 and 1975 – when retiring at 70 years by sector offering a broad picture of the effects when retiring at 70 years..

Figure 6.8 Pension indicators. RR-LI and pension income composition by age and sector. Exit at 70 years



6.3 Comparing pension levels by withdrawal age

In this last section we conduct a comparison of pension levels achieved at the three different exit ages – 62, 67 and 70 - in order to give a full overview of the effects found when extending working careers. Since the differences between age groups are so large when it comes to pension accrual, we will also do the comparisons for persons born 1953, 1965 and 1975.

Therefore, in figure 6.9 we show average life income pension indicator (RR-LI) by age group and labour market exit age for all employees. The figure shows the two very different effects, namely higher pension level when labour market withdrawal is extended and reduced pension levels for future pensioners. It is interesting to see that employees born 1975 only achieve a slightly higher pension level than the 1953 cohort did at 62 if they work until 70 years. That clearly illustrates the effect of the life-expectancy mechanism built into both state and occupational pension plans.

Figure 6.9 Replacement rate – RR-LI – by age group and exit age from labour market. All employees.

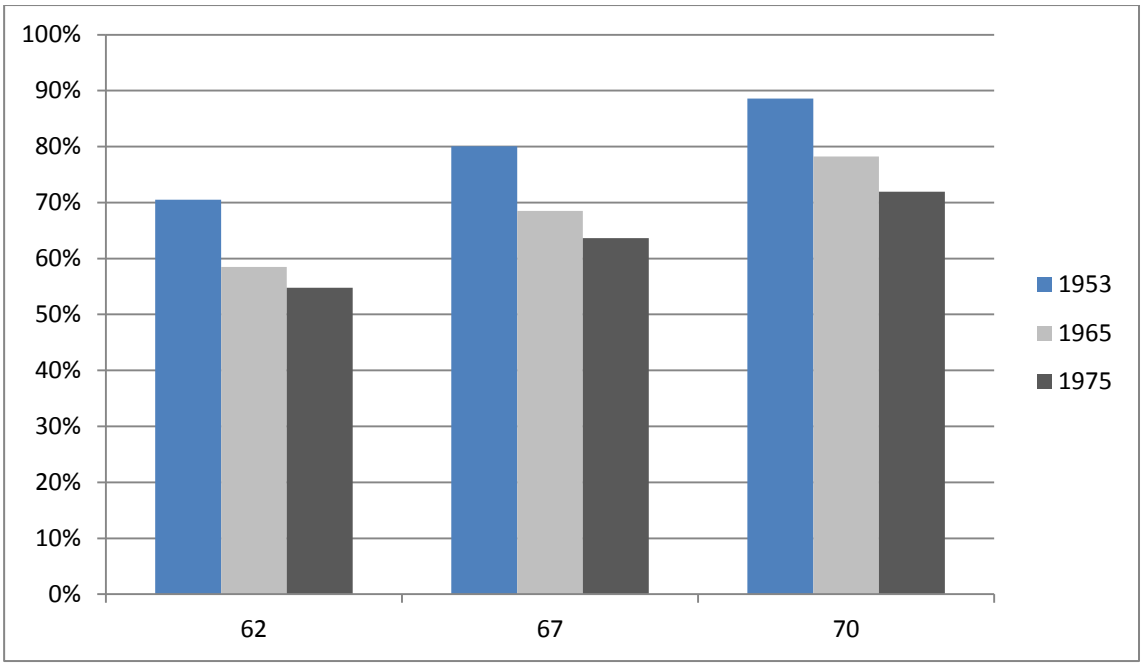
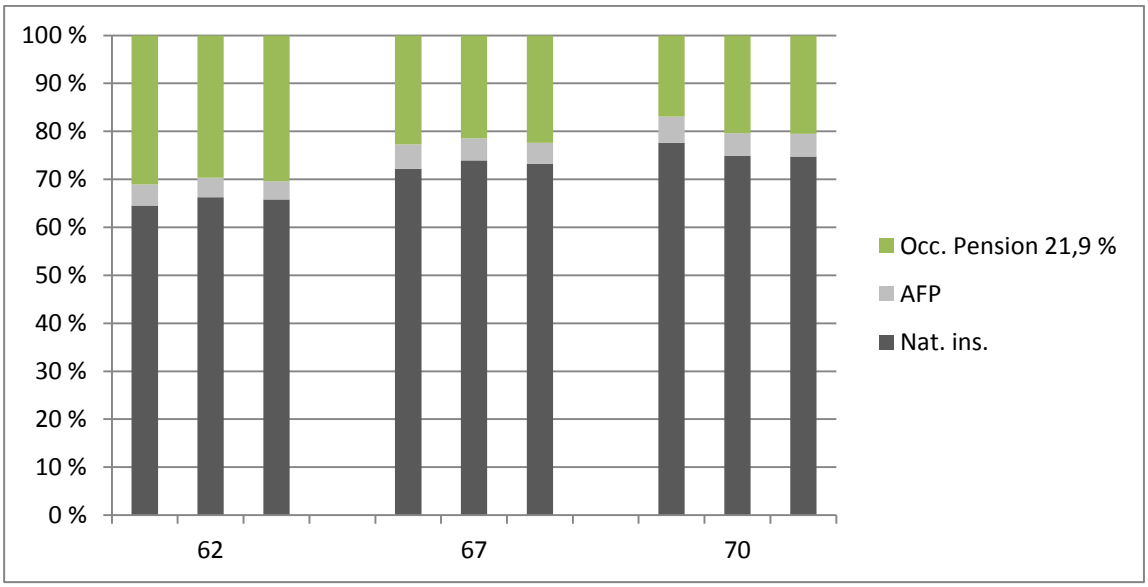


Figure 6.10 shows the composition of the total income package again by age group and labour market exit age. The income composition is divided into state or national pensions, AFP and occupational pensions.

Figure 6.10 Pension income composition for RR-LI by age group and exit age from labour market. All employees.



In the following figures the precisely same calculations as shown in figure 6.9 and 6.10 are presented for public and private sector employees separately – see figure 6.11 to 6.14. These are maybe better illustrations of the combined age and exit effect because the systems are very different in public and private sector. As we can see in figure 6.11 increasing working careers in public sector offer little reward in pension terms.

Figure 6.11 Replacement rate – RR-LI – by age group and exit age from labour market in public sector

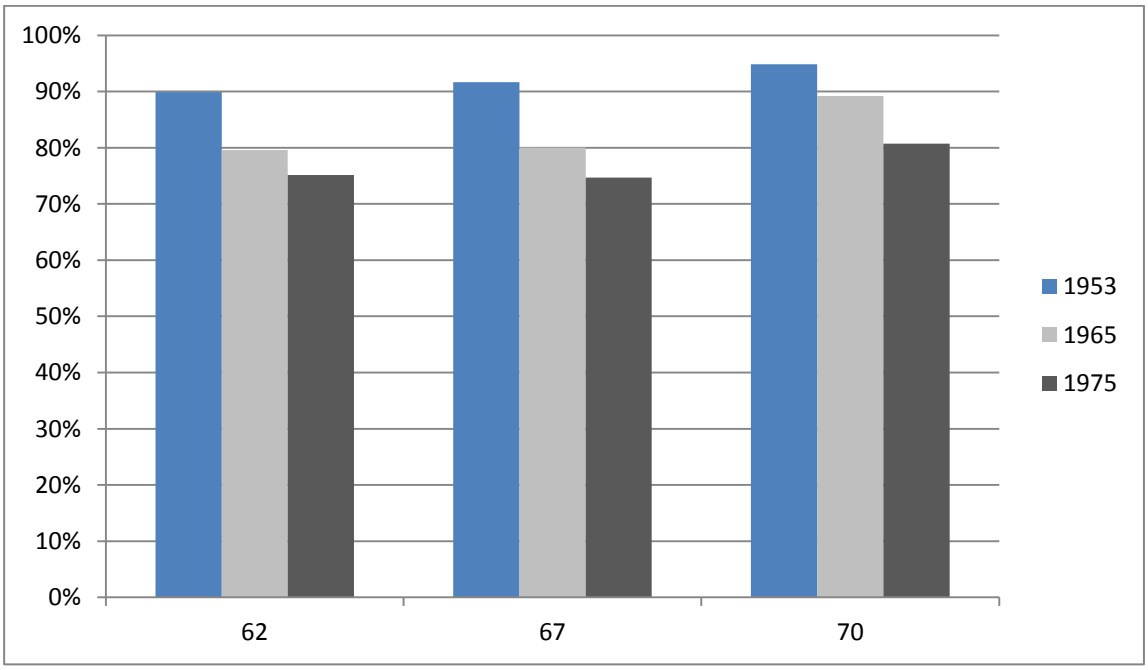
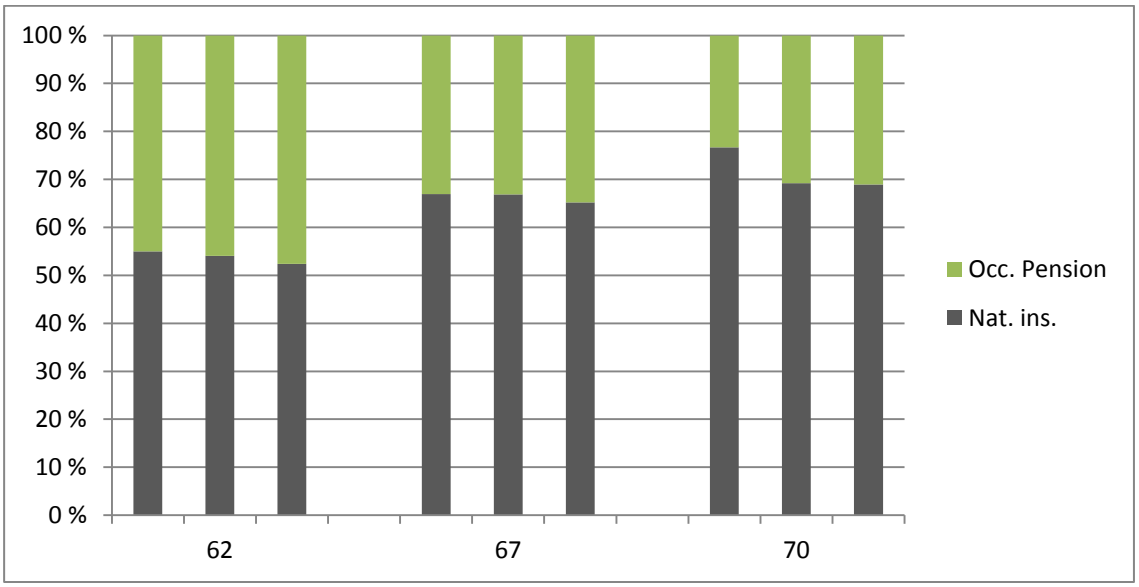


Figure 6.12 Pension income composition for RR-LI by age group and exit age from labour market. Public sector.



Turning to private sector employees the pension rewards are high when extending the working careers. And, the younger age groups will find themselves at a pension level equal to what the 1953 group had when working until 70 years.

Figure 6.13 Replacement rate – RR-LI – by age group and exit age from labour market in private sector

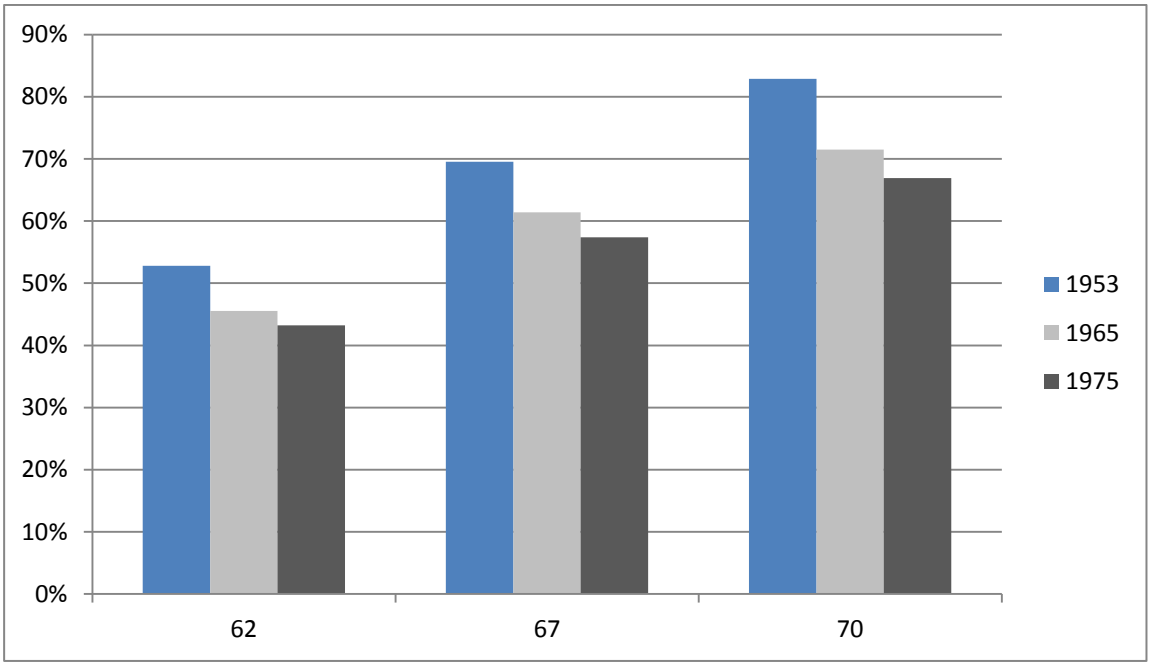
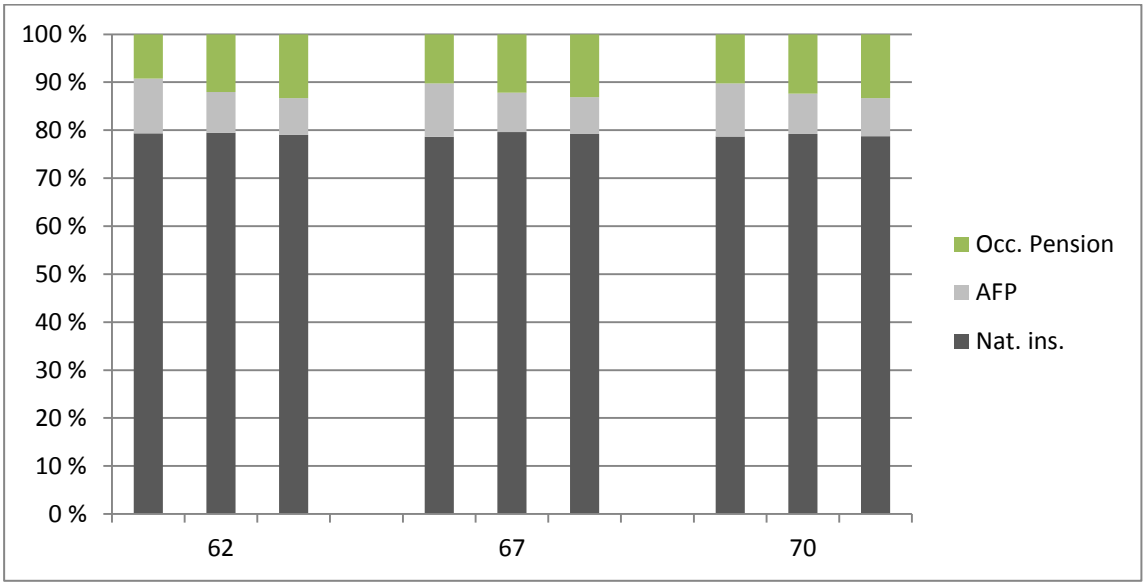


Figure 6.14 Pension income composition for RR-LI by age group and exit age from labour market. Private sector.



Another highly relevant difference one will find between men and women. The higher replacement rates among women in total stems from a combination of a large proportion of women working in public sector and a lower average income level than men.

Figure 6.15 Replacement rate – RR-LI – by age group and exit age from labour market. Men and women.

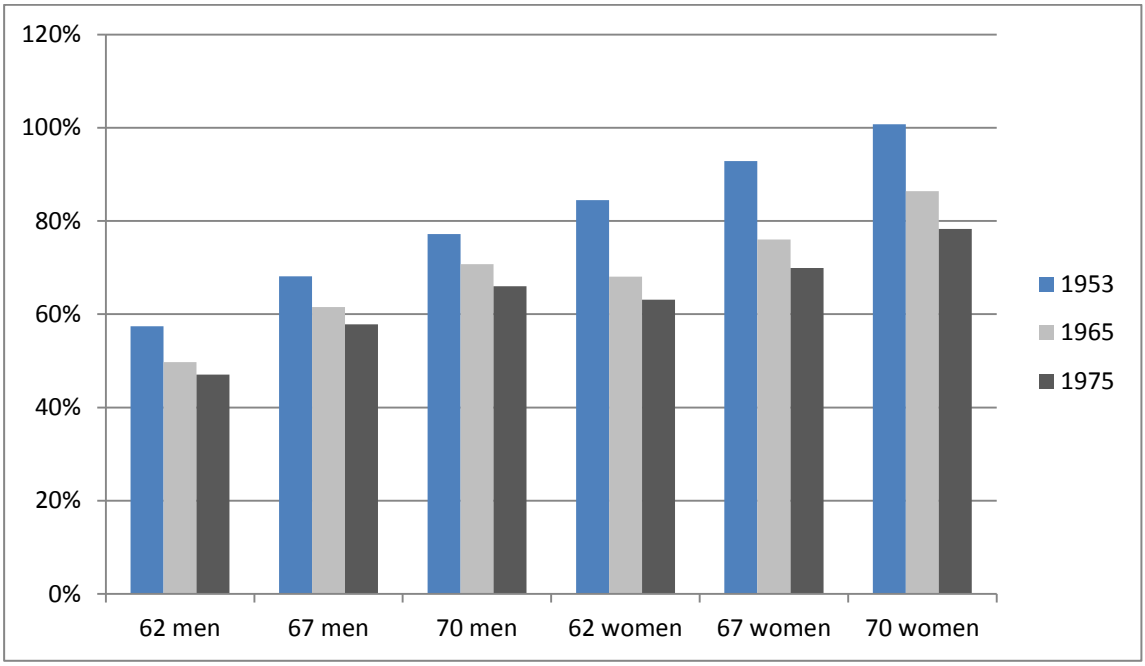
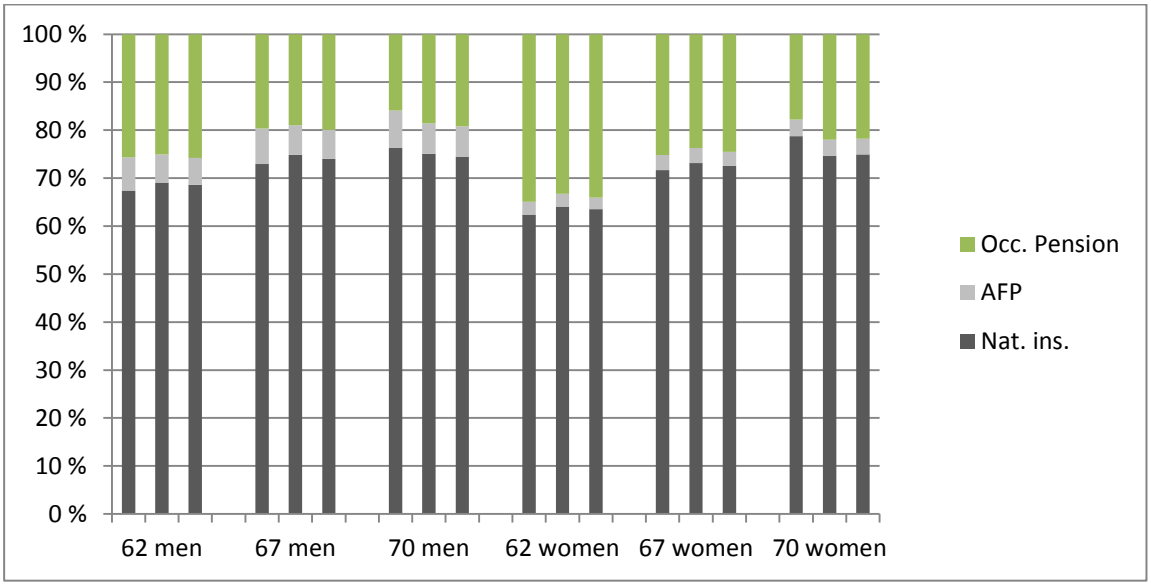
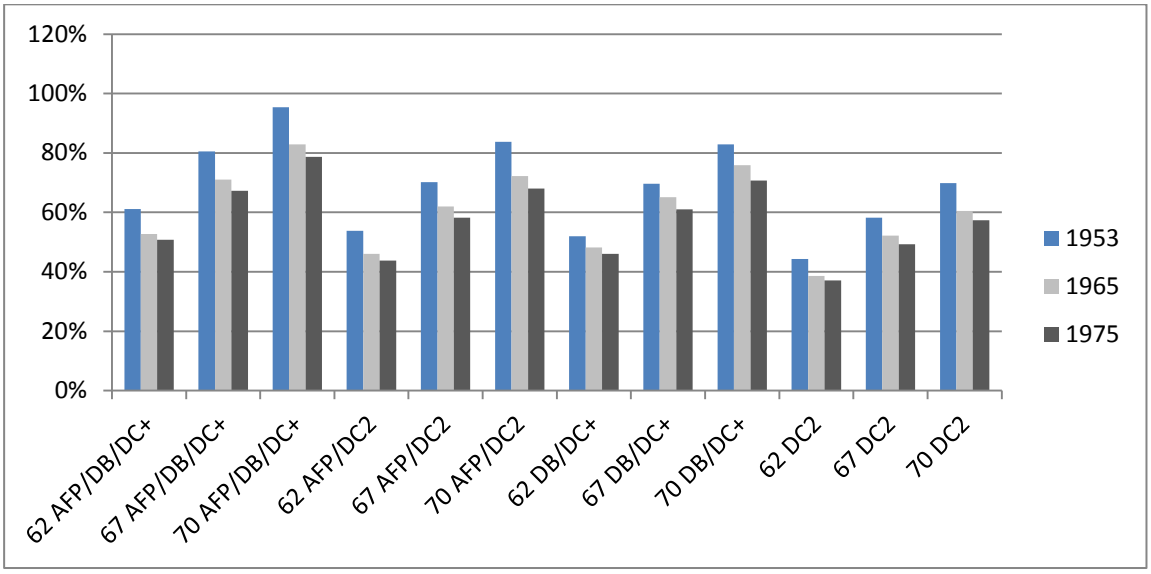


Figure 6.16 Pension income composition for RR-LI by age group and exit age from labour market. Men and women.



When looking at variation across pension packages coverage the picture pension winners and looser becomes clearer. If working until 70 even younger age groups covered by AFP and a good occupational scheme can reach pension levels of 80% of average life income. For those who are covered by national pensions and DC2% schemes in the same age groups an extension of working life until 70 years will still leave them with pension levels under 60%.

Figure 6.17 Replacement rate – RR-LI – by age group and exit age from labour market. Coverage by different pension packages. Private sector



In table 6.18 we show the RR-LI indicator by age group and labour market exit age and our main break down variables in order to give a broad overview.

Table 6.18 Replacement rate – RR-LI by selected variables.

	Born 1953			Born 1965			Born 1975		
	62	67	70	62	67	70	62	67	70
Public	89.9%	91.6%	94.9%	79.6%	80.0%	89.2%	75.1%	74.7%	80.7%
Private	52.8%	69.5%	82.8%	45.5%	61.4%	71.5%	43.2%	57.4%	66.9%
Men	57.5%	68.1%	77.2%	49.7%	61.6%	70.8%	47.1%	57.8%	66.0%
Women	84.5%	92.9%	100.7%	68.0%	76.0%	86.4%	63.1%	69.9%	78.3%
Private sector men	48.3%	63.2%	75.0%	42.5%	57.8%	67.1%	40.6%	54.4%	63.2%
Private sector women	62.3%	83.0%	99.5%	51.0%	67.9%	79.4%	47.7%	62.5%	73.3%
Low income	85.0%	94.3%	108.0%	67.4%	75.7%	90.2%	61.0%	68.7%	82.0%
Median income	71.5%	80.7%	88.2%	59.3%	69.4%	78.1%	55.1%	64.1%	70.9%
High Income	57.7%	68.4%	76.0%	47.3%	58.6%	66.7%	45.9%	55.6%	62.3%
AFP/DB/DC+	61.2%	80.5%	95.4%	52.7%	71.0%	82.8%	50.8%	67.2%	78.7%
AFP/DC2	53.9%	70.2%	83.7%	46.1%	62.0%	72.2%	43.7%	58.2%	68.0%
DB/DC+	51.9%	69.6%	82.9%	48.2%	65.1%	75.9%	46.0%	61.0%	70.8%
DC2	44.3%	58.3%	69.9%	38.6%	52.2%	60.5%	37.1%	49.3%	57.4%

Chapter 7 Income distribution among future pensioners

This chapter looks at the distribution of pension income among future pensioners. In the first section we discuss the overall distributional outcome comparing income from work with income from pensions. In the next section we ask who will have a future pension below what is seen as a low income level in the society as a whole.

We have chosen to calculate the distributional outcomes when pension withdrawal is assumed to take place at 67 years.

The main findings of this chapter are:

- Total estimated pension income are far more evenly distributed than income from work
- The national pensions system has a significant redistributive effect
- Occupational pension plans tends to reproduce income differences found among wage earners
- The labour marked based contractual pension schemes – AFP – only covers half of private sector employees and hence produces income differences among future retirees.
- Pension income in Norway is guaranteed at a minimum level higher than the standard household unit poverty level according to the OECD definition.
- If risk of low pension is calculated as 50% of median personal income in the total population, only around 9% will have a future pension payment lower than this level. The highest proportion of future pensioners with low income is found in private sector service industries.
- Risk of having a low pension level at 67 year labour market exit will be significantly higher for younger age groups than older.

7.1 Income distribution

Norway is one of the riches countries of the world and it has one of the lowest differences in income found internationally. It has also for some years in a row been number one on the very broad measure of level of living conditions found in the UN Human Development Index.

The most important explanation behind the relatively even income distribution is a centralized and coordinated system of wage setting producing relatively small differences in wages. Again, the distribution of pension payments is to a large extent a result of the former wage distribution. Nevertheless there are built in re-distributional effects in the benefit calculation system in the

national system (minimum pension guarantee and more generous accrual at low and median income) as well as differences in coverage of private arrangements that make the distributional result more than a copy of the wage distribution. Hence, an analysis into the distribution of pension income is interesting and politically relevant.

The distribution of pension income should ideally be analyzed in a comparative study across countries. A comparative analysis is, however, outside the scope of this study. What we will do is to compare the distribution of the registered income in our data set and compare this with estimated income distribution among future pensioners. Moreover we will look at the distributional outcome of different pension components, i.e. income from national pensions, contractual arrangements and occupational schemes.

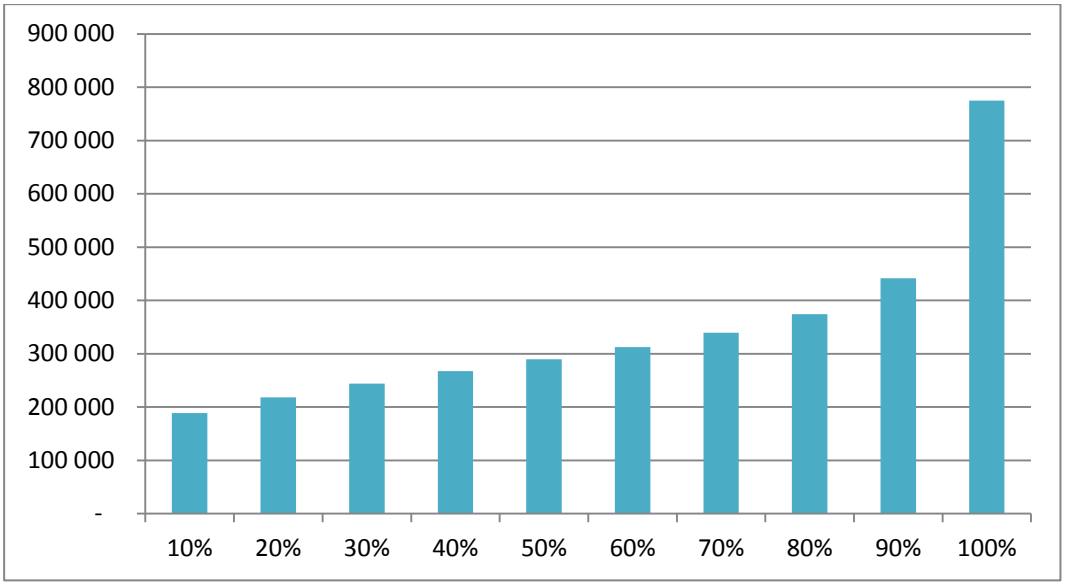
As a point of departure we present the average income for some different income categories split into 10 deciles from the 10 percent with lowest income to 10 percent with highest income. In descriptive statistics a decile is a division of sorted data into ten equal parts, so that each part represents 1/10 of the sample or population. The data is, as already pointed to, sorted starting with the individual that has the lowest income up to the one with the highest income.

In our data set and trough the estimation made we have looked at the following income categories:

- Total pension qualifying income in 2013
- Average life pension qualifying income
- Total estimated income from pensions
- Pension income from the national pension system
- Pension income from the contractual pension scheme – AFP
- Pension income from occupational pension schemes

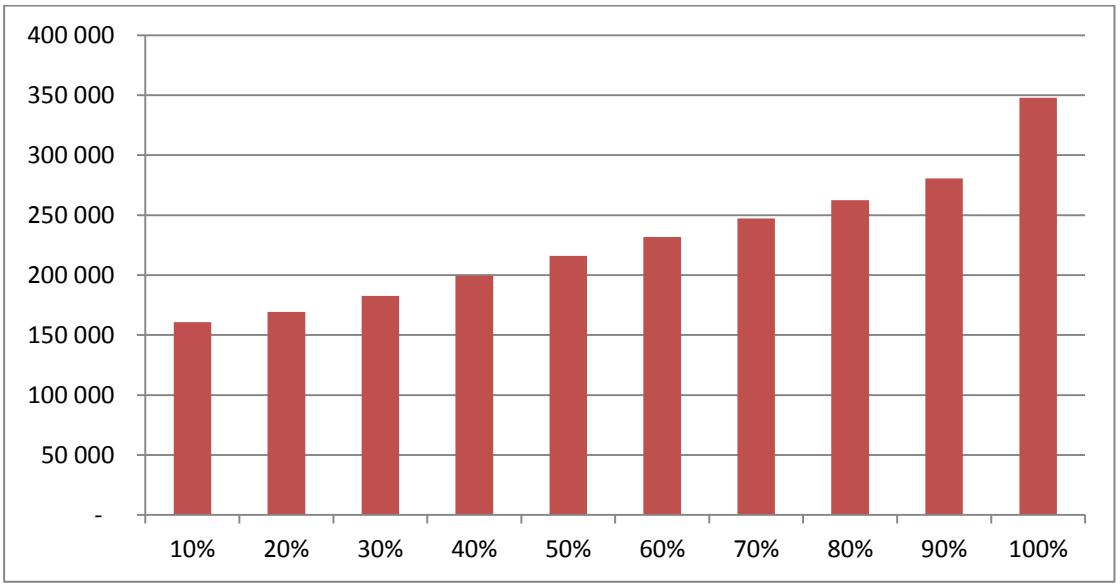
In figure 7.1 to 7.5 we show how the different pension components are distributes across the ten income groups from the lowest to the highest. Figure 7.1 show total estimated pension income in 2013 for each of these deciles. We can see that the total pension level varies from under 200 000 in the lowest income group to around 400 000 NOK I the middle group and growing to more than 800 000 NOK in the top decile.

Figure 7.1 Total estimated pension income in 2013 NOK. Percentiles.



In figure 7.2 we show only the pension income accumulated from the national pension system. As would be expected the distributional outcome is more even and pension levels are lower.

Figure 7.2 Estimated pension income from the national pension system in 2013 NOK. Percentiles.



The last two figures show the distributional effect for labour market AFP scheme and the different occupational arrangements. Since the AFP has a limited coverage, the distributional outcome is shown for both all employees (figure 7.3) and only for those covered (7.4).

Figure 7.3 Estimated pension income from AFP in 2013 NOK. Percentiles. Among all employees.

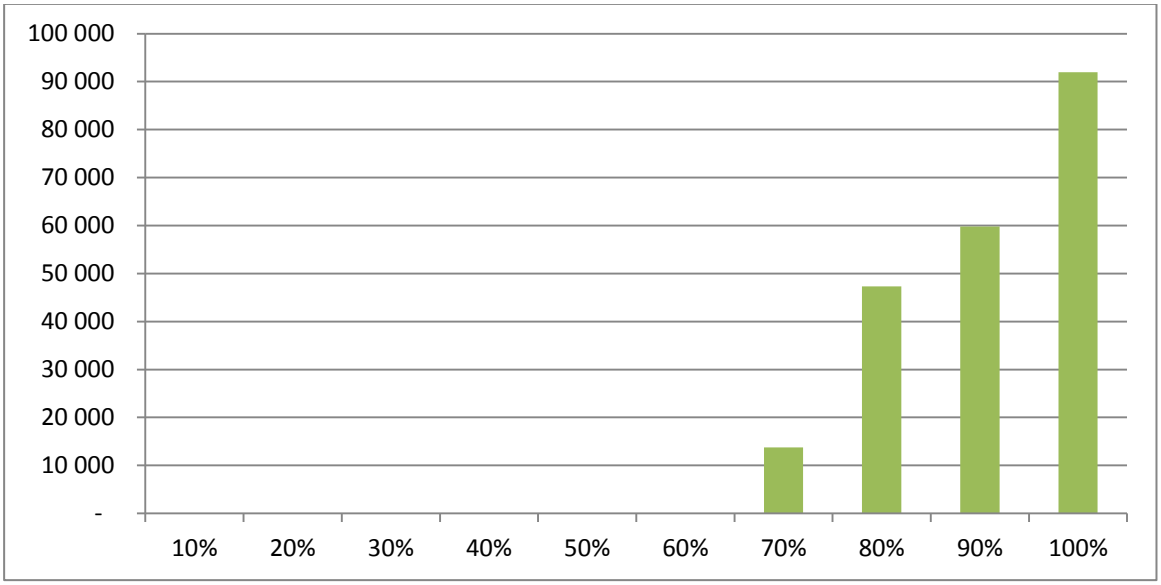
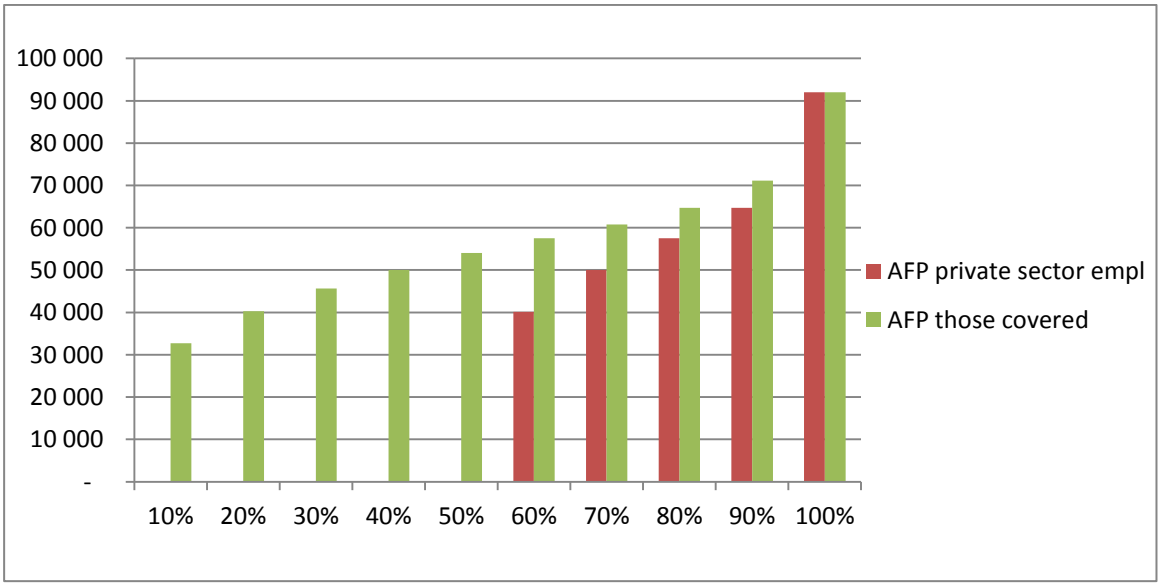
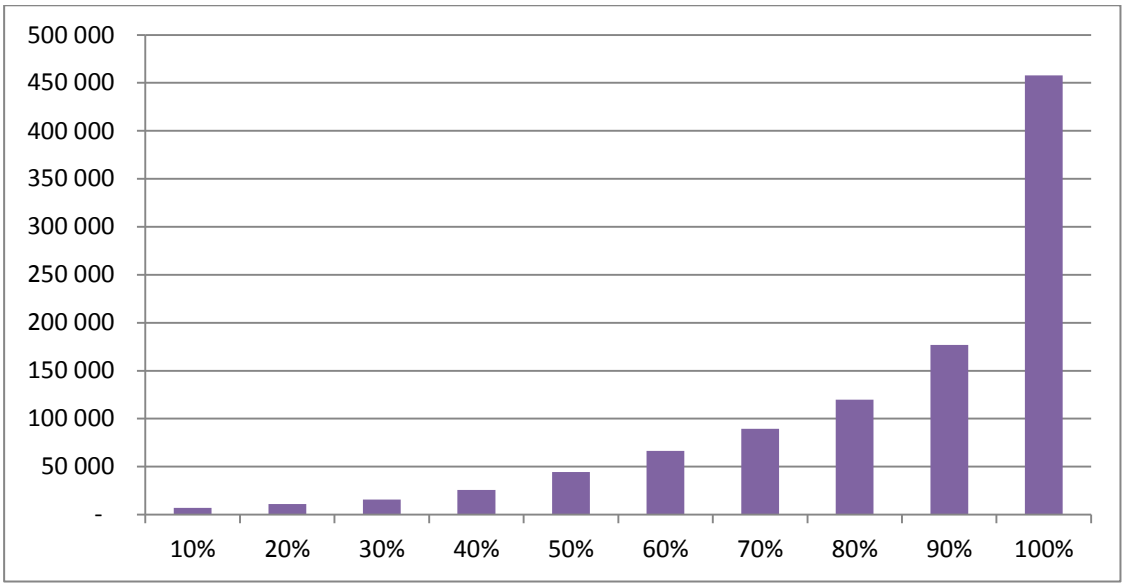


Figure 7.4 Estimated pension income from AFP in 2013 NOK. Percentiles. All private employees and only those covered by AFP.



And last, figure 7.5 shows how pensions accumulated from occupational plans are distributed among all employees.

Figure 7.5 Estimated pension income from occupational pension schemes. 2013 NOK. Percentiles.



These figures clearly show that pension income from the national pension system has a more even distribution, indicating the redistributive effects built into this system. This stems first of all from a minimum income guarantee, but also from a somewhat higher benefit accumulation for low and middle income groups. Not surprisingly, income from occupational pensions has a different profile which one must assume is relatively similar to the one found for income from work.

Table 7.1 shows the proportion total income for each decile. We have calculated both average life income as well as income earned in 2013. One can see that both measures of total income are more unevenly distributed than is the total pension income. The ten percent with highest income have 23% of all income. On the other hand the ten percent with highest pension income receive only 18% of total payments from different pension arrangements.

If we look at the three elements of the total pension system one can see that 43% of payments from AFP are received by the ten percent with highest payments from the AFP-scheme. This is of course due to the fact that AFP cannot be obtained neither among public sector employees nor among half of the private sector employees. As we saw in figure 7.4 the distributional outcome is very different when looking only at the intra AFP distribution. Here, both measures are relevant telling different aspects of the AFP story.

For occupational pensions, 36% of total payments go to the 10 percent with the highest occupation pension incomes.

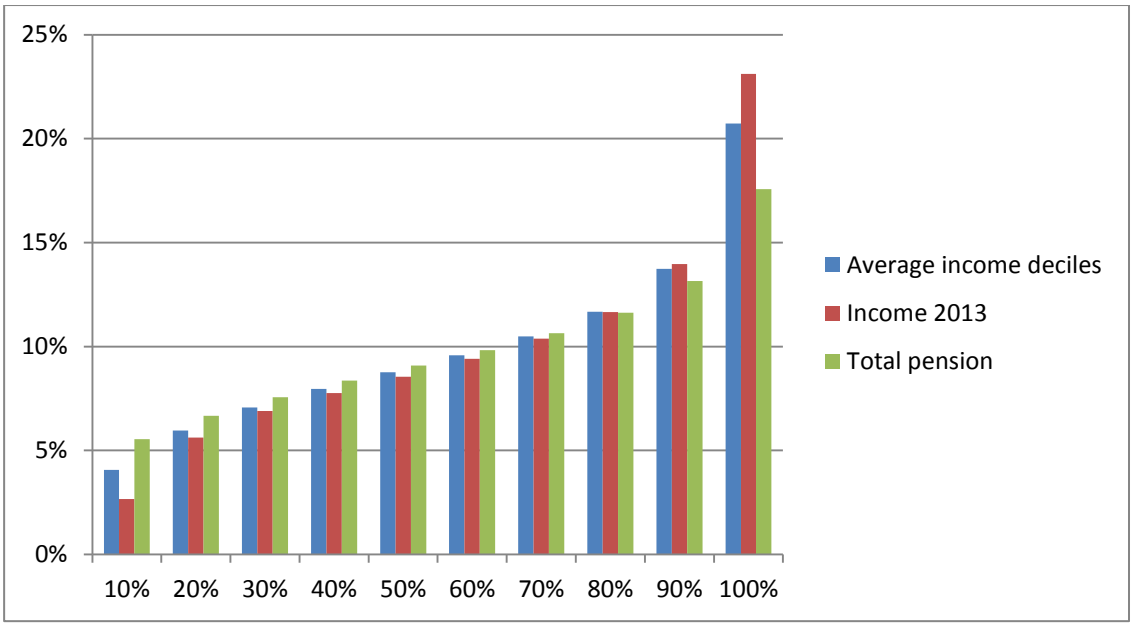
Table 7.1 Income share[14] of total from each decile:

	0 – 10%	10 – 20%	20 – 30%	30 – 40%	40 – 50%	50 – 60%	60 – 70%	70 – 80%	80– 90%	90 – 100%
Average life income	4.1%	6.0%	7.1%	8.0%	8.8%	9.6%	10.5%	11.7%	13.7%	20.7%
Income 2013	2.7%	5.6%	6.9%	7.8%	8.5%	9.4%	10.4%	11.7%	14.0%	23.1%
Pension income	5.5%	6.7%	7.6%	8.4%	9.1%	9.8%	10.6%	11.6%	13.1%	17.6%
National pension system income.	7.1%	7.6%	8.0%	8.8%	9.5%	10.3%	11.0%	11.7%	12.4%	13.6%
AFP all	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	23.1%	33.9%	42.9%
AFP- those covered	4.8%	7.0%.	8.2%	9.1%	9.9%.	10.6%	11.2%	11.9%	12.8%	14.6%
Occupational pension	0.5%	1.2%	1.8%	2.8%	4.8%	7.7%	10.7%	14.4%	19.9%	36.2%

The distribution for average life income, income in 2013 and the total pension income is presented in figure 7.6. One can clearly see that total pension income is more evenly distributed than the two other income measures.

[14] The share of total population income taken from all within the group of the 10 per cent having income just below the given percentile.

Figure 7.6 Share of total income for average life income, pension qualifying income 2013 and total estimated life-long yearly pensions. All employees. Deciles.



In figure 7.7 we have decomposed the total estimated pension payments into the three different pension income categories, namely national pension payments, AFP and occupational pensions. The most striking finding is the difference between the pension income from the national pension system, with its far more even distributional profile than the private labour market based pension components.

Figure 7.7 Share of total income. National pensions, AFP and occupational pensions.

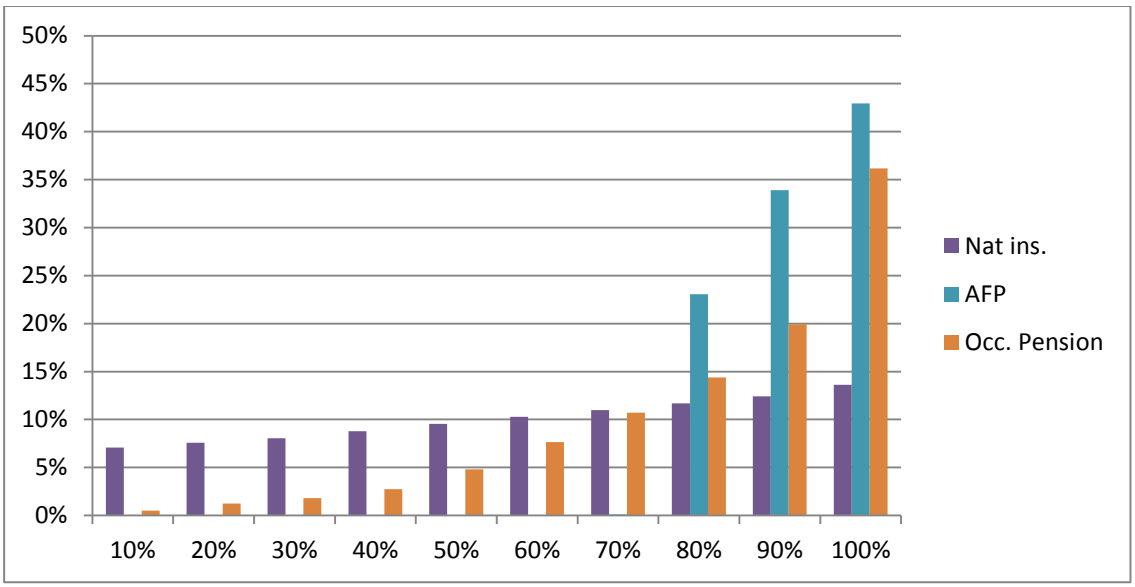


Table 7.2 sums up the average income level in each decile for the different income categories and adds the GINI-coefficient. The 2013 income measure (pension qualifying income) shows a GINI of .282. This fits nicely with the level of the GINI-coefficients traditionally calculated by Statistics Norway for all income (ref .28 in 2012). What we see is that total estimated pension income shows a GINI of only .184. In other words, a low coefficient indicating the redistributive effects built into the pension system.

Table 7.2 Average income for different income categories for selected deciles. Total average for whole population NOK 2013. GINI coefficients for average life income, income 2013 and total pension income.

	10%	30%	50%	70%	90%	100%	Average	GINI	N
Average income	197 388	342 988	425 217	508 534	666 484	1 005 798	485 306	0.241	124 467
Income 2013	143 229	371 016	459 477	557 962	751 446	1 242 969	537 870	0.282	124 467
National insurance	154 476	175 256	207 745	239 518	270 891	296 663	217 919		124 467
AFP – all	0	0	0	148	53 912	68 274	15 898		124 467
AFP–covered	25 396	43 038	52 089	59 176	67 556	77 177	52 756		37 507
Occupa–tional pension	3 702	13 171	34 664	77 567	143 974	261 656	72 307		124 467
Total pension	169 466	231 375	278 148	325 478	402 361	537 706	306 123	0.184	124 467

7.2 Poverty and low income

Also when it comes to risk of having low income, or poverty as it is more frequently phrased, Norway has relatively few individuals living under the poverty line (Fløtten et al. 2011). In 2010 4.5% of the population was below the OECD poverty level (50% of median income). If one measure lasting poverty (more than a three year period) around 3% experience this (Herund and Naper 2012).

Poverty has increased marginally the last decade in Norway. Still poverty levels are low in an international perspective (Fløtten 2011:22). There is however in Norway no national politically decided poverty level in absolute or relative terms. Hence both the OECD and the EU-measure (60% of median income) are frequently used in research and in government policy documents.

Here we will take as our starting point the OECD 50% of median income as an indicator. A standard way of doing risk of low income calculations are to calculated household income and then estimate an individual income level base on the household personal consumption level.

This was estimated to 129 200 NOK in 2011 by Statistics Norway and would be around 145 000 in 2013. In other words the poverty line calculated as 50% of median household income per household consumption unit is under the actual minimum pensions benefit in the Norwegian system. Which, of course is a relevant finding when trying to understand the social policy effect of pension politics in Norway.

An alternative method would be to calculate 50% of median personal pension qualifying income as calculated by Statistics Norway for the age group of 16 to 74 years. This is 185 000 NOK in 2013 and is somewhat higher than the traditional household based poverty line and higher than the minimum pensions guarantee. It should be underlined that this is not to be seen as a measure of poverty, but only as an indicator of people having a relatively low pension level. One should also remember that 2% occupational pension savings are statutory, hence contributing to higher pension payments for many than found only in the minimum guarantee.

Table 7.3 Low pension income indicator. Proportion with average pension income below 50% of median personal income (pension qualifying income 16-74 years) NOK 185 000. Percent by sector, men and women.

	Proportion with pension below limit	N
Public sector	**7.7%**	**49 312**
Men	4.2%	15 042
Women	9.3%	34 270
Private sector	**9.8%**	**75 155**
Men	5.6%	49 178
Women	17.9%	25 977

Table 7.3 shows than relatively few will receive pensions that are less than 50% of median personal income for the whole population. The highest proportion is found among women in private sector were 18% will have low pension payments. One should remember that these calculations are based on labour market exit at 67 years. Earlier exit will increase the low pension income problem. The same numbers as in table 7.3 are shown in figure 7.8 below.

Figure 7.8 Proportion with low pension income at 67 years pension withdrawal. 50% of median pensionable income.

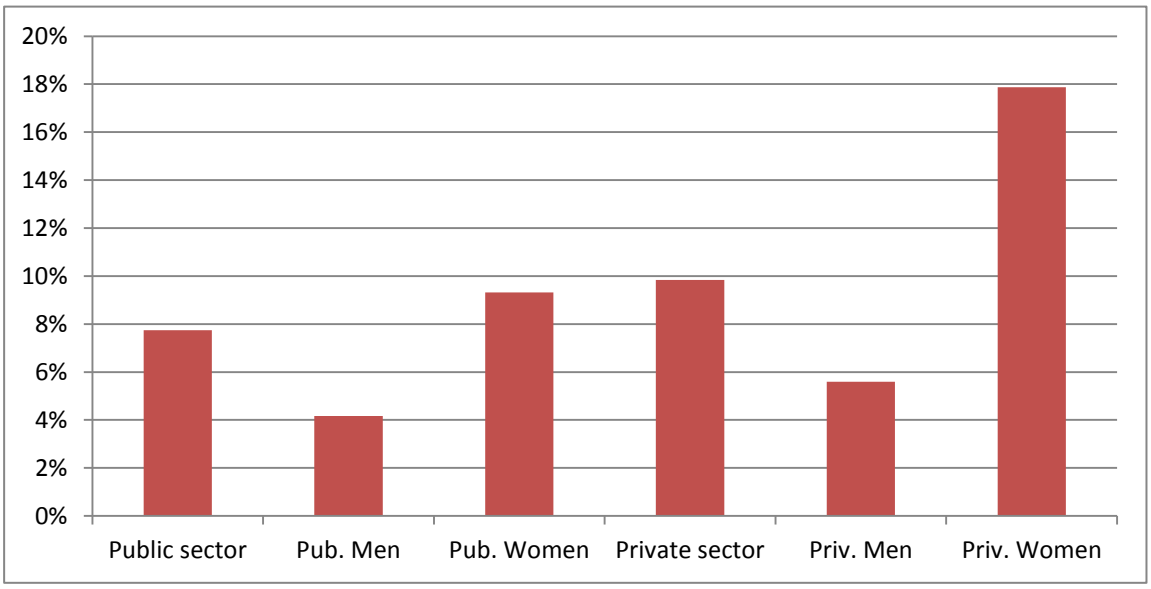


Table 7.4 shows the risk of having low pension income at 67 years pension withdrawal by sector and industry. It shows that this is first of all a private sector issue and that the highest levels are found in private service industries.

Table 7.4 Proportion with pension income below low income level by sector and industry. 50% of median pensionable income.

	Proportion with pension below limit	N
Public sector	**7.7%**	**49 312**
Private sector	**9.8%**	**75 155**
Mining and oil	0.8%	2 929
Manufacturing	5.3%	14 959
Energy, construction	8.4%	8 152
Retail	15.0%	17 792
Transport and communication	7.7%	7 846
Financial services	1.9%	3 169
Real estate etc.	10.4%	13 667
Private education and health	20.3%	4 172
Personal services	12.0%	2 469

As could be expected from the previous analysis of different pension accrual across age groups the low income problem will be more significant among future pensioners than among those retiring relatively soon. The estimated low income risk is doubled from the 1953 age group to the 1975 age group.

Table 7.5 Estimated low pension income risk by age group – 1953 – 1965 – 1975 and sector at withdrawal 67 years. 50% of median pensionable income.

	Proportion with pension below limit	N
1953	**5.7%**	**3 872**
Public sector	5.5%	1 850
Private sector	5.9%	2 022
1965	**8.7%**	**5 267**
Public sector	6.9%	2 008
Private sector	9.8%	3 259
1975	**13.1%**	**4 760**
Public sector	10.3%	1 727
Private sector	14.7%	3 033

Chapter 8 Individual pension savings, return in DC plans, tax-effects and the importance of private wealth

This chapter looks briefly at other relevant aspects of future pension accumulation and of alternative ways of financing consumption as retirees. First, we illustrate the effect of different return on occupational pension capital in defined contribution schemes. Second, we show some illustrations of pre- and post-taxation effects on replacement rates. Third, we offer a look into the importance of individual pension savings in Norway. And last, we examine other potential sources of income in old age such as home ownership and other forms of private wealth.

These discussions are meant for illustrative purposes only and not as an in depth analysis of these issues. The ambition is to illustrate the potential importance these factors can have on future pension levels directly, or as alternative mechanisms of financing consumption during one's pension age, such as through private wealth. In a more detailed analysis information on individual savings and wealth could have been linked to income data on an individual level. However, such data has not been available in this project. Nevertheless, a relatively brief overview of these factors may contribute to a broader picture of the Norwegian pension system.

The main findings in this chapter are:

- The level of return on the DC pension capital is vital for the future pension level accumulated in the DC-plans. For individuals born in 1975 covered by a DC plan, an increase in return of 2 percent points (4.4 to 6.4%) a year will raise the replacement rate (RR-LI) by 46%. Individuals born 1975 who are covered by a max DC-plan (5 and 7%) can have a replacement level from their DC occupational plan alone of 14.6% if the yearly average return is 6.4%. If the return falls back to 2.4%, the replacement level will be only 6.9%.
- Estimates of the after tax effect on replacement levels show that there will be a strong effect if current tax regulations are continued. On average, replacement rates can increase by 10 percentage points when calculating pension payments after tax relative to previous average life income after tax.
- Individual pension savings accounts have very limited importance in Norway. Only around 15% of the total populations have an individual savings account for pension purposes.
- Moreover, even though financial products that shift private wealth into consumption among older people have a very limited importance in Norway, there is a large potential for financing consumption in old age by drawing on private wealth. In Norway more than 80% of households own their own home. Households where the main income earner is age 55 or higher have the highest net worth of wealth. The distribution of private wealth is very uneven. Therefore it hard to see private wealth this as a mechanism of solving a possible low pension income problem.

8.1 Return on DC pension capital

In order to illustrate the effect of return on the capital invested in defined contribution (DC) plans we have calculated three different levels of return. We have taken all individuals covered by DC-plans in the data set and used the same assumptions as in the previous analysis on plan quality as before, i.e. more than half of the DC-covered are members of minimum schemes of 2%, nearly half are covered by 5% (8% 6 to 12G) plans and half of these will see an increase in their savings level to 7% from 2015 (7% to 7.1G and 25% from 7.1G to 12G).

In the previous estimations we anticipated a return of 4.4% each year from the capital accumulated in DC plans. In table 8.1 we show the effect of 2.4%, 4.4% and 6.4% return on the DC-pensions capital per year on the replacement level achieved in the DC occupational plan (RR-LI). In other words, we reduce and increase the previous expected return with 2%. Of course the effect will be higher if the remaining time to pension withdrawal is long. Therefore we present calculations also for individuals born 1953, 1965 and 1975.

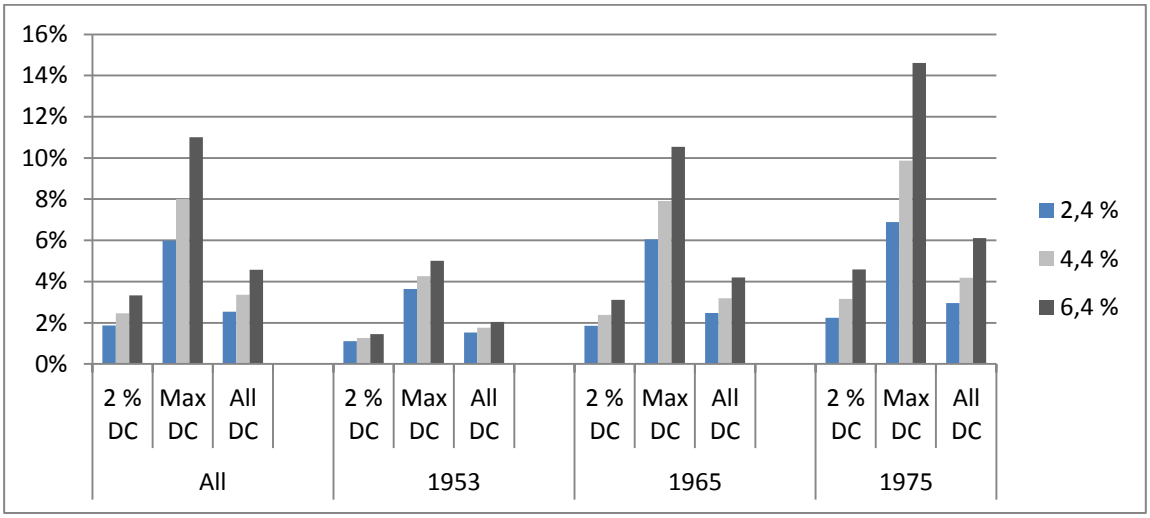
As shown in the table, higher return is vital for the future pension level accumulated in the DC-plans. For individuals born in 1975 covered by a DC plan an increase in return from 4.4% to 6.4% increases the replacement rate by 46%. For individuals born 1953, with a short time left to retirement, the increase is only 16%. If we look at individuals born 1975 that were members of a max DC-plan in 2013 the replacement rate can be as high as 14.6% if return is 6.4% a year, and only 6.9% if the return falls back to 2.4%. Even for those born in 1975 who are covered by 2% DC plans an increased return will have a significant effect on the replacement rate (from 2.2% to 4.6%).

Table 8.1 Average RR-LI by return on DC pension capital. 2.4%, 4.4% and 6.4%. All employees covered by DC-plans, individuals covered by DC plans born 1953, 1965 and 1975.

		2.4%	*4.4%*	*6.4%*	*N*
All	2% DC	1.9%	2.5%	3.3%	44 021
	Max DC	6.0%	8.0%	11.0%	8 485
	All DC	**2.5%**	**3.4%**	**4.6%**	**52 506**
1953	2% DC	1.1%	1.3%	1.5%	1 124
	Max DC	3.6%	4.3%	5.0%	221
	All DC	**1.5%**	**1.8%**	**2.0%**	**1 345**
1965	2% DC	1.9%	2.4%	3.1%	1 968
	Max DC	6.1%	7.9%	10.5%	339
	All DC	**2.5%**	**3.2%**	**4.2%**	**2 307**
1975	2% DC	2.2%	3.2%	4.6%	1 895
	Max DC	6.9%	9.9%	14.6%	339
	All DC	**3.0%**	**4.2%**	**6.1%**	**2 234**

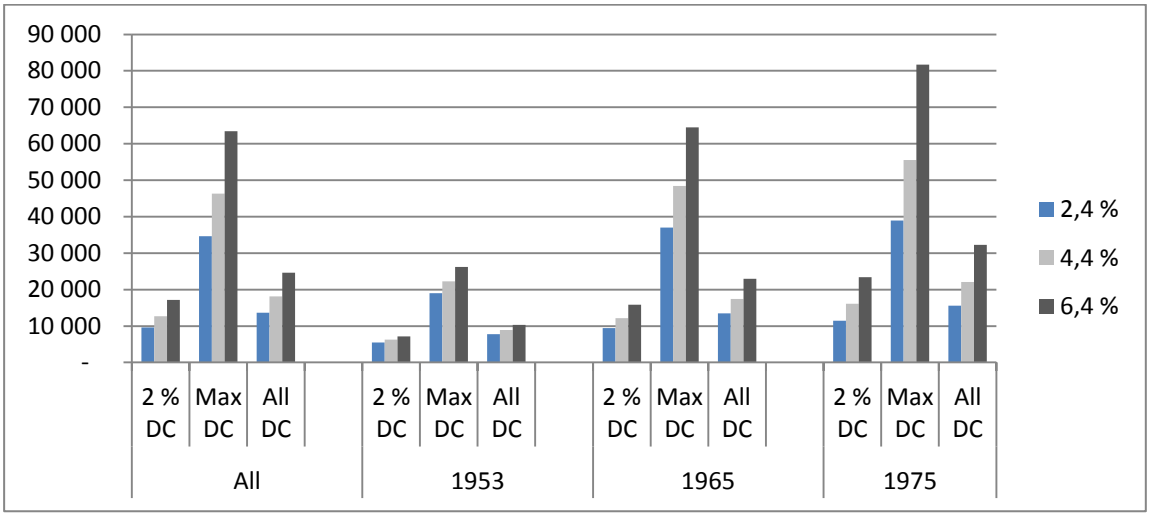
The results from table 8.1 are shown in figure 8.1 below.

Figure 8.1 Average RR-LI by return on DC pension capital. 2.4%, 4.4% and 6.4%. All employees covered by DC-plans, individuals covered by DC plans born 1953, 1965 and 1975.



In figure 8.2 we show the same estimations as in figure 8.1, but presented as the actual amount paid in yearly pensions in 2013 NOK.

Figure 8.2 Yearly pension payments in 2013 NOK by return on DC pension capital. 2.4%, 4.4% and 6.4%. All employees covered by DC-plans, individuals covered by DC plans born 1953, 1965 and 1975.



8.2 Pension levels before and after tax

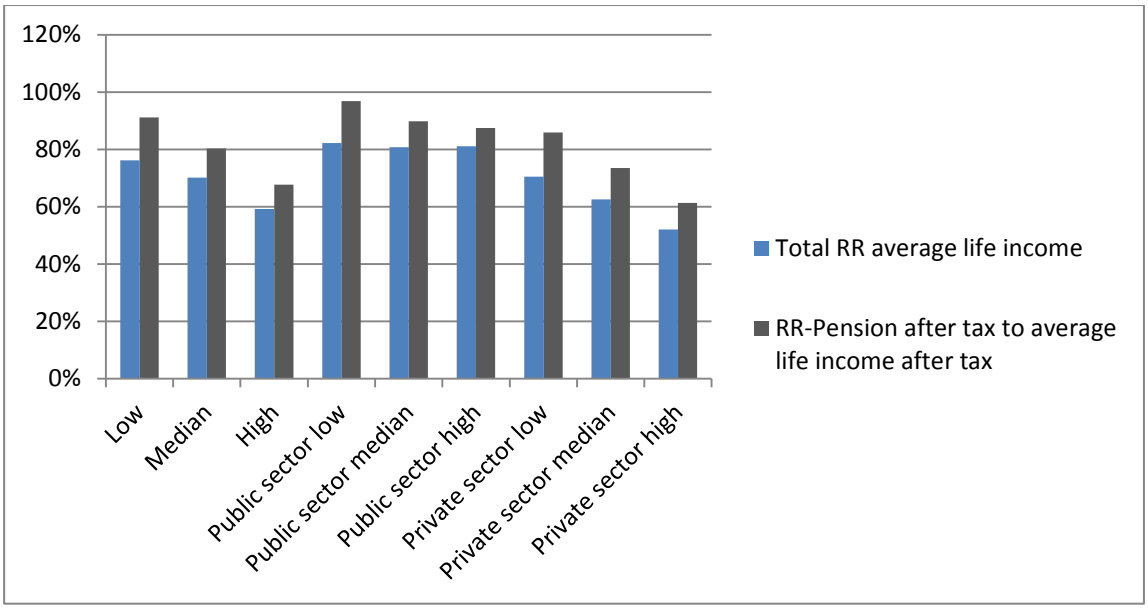
Because of different tax treatment of wage, capital income and income from pensions, as well as the effects of lower progressive taxation when income levels are reduced, the actual income level from pensions calculated after tax can be significantly higher than when comparing work and pension income before tax. This would be the case in many countries, and it the case in Norway. Presently in Norway, the social security contribution is lower for pension income than for income from work. Although other tax rates are the same for income from work and for pension income, pension income that is lower than previous occupational income will be less affected by the progressive nature of the tax rates. Finally, a specific deduction is made for tax on pension income, which has a practical significance for pension income 6.3 G and lower.

It is however hard to say what future tax rules will be. In many countries there is a tendency to reduce the difference in tax treatment of wage earners and pensioners. In Sweden (Berglund and Esser 2014) tax reductions have for example been targeted towards wage earners through specific "job tax deductions", a policy also debated in Norway. The uncertainty of future tax treatment of pensions is one of the reasons we have chosen to present before tax estimates on replacement levels. On the other hand, there will undoubtedly be an after tax effect that will raise pension levels for many individuals compared to their after tax income levels as employees if the main features of the current tax regime is kept in place. We have therefore chosen to calculate the after tax pension replacement level in this chapter to illustrate the effect of the present Norwegian tax regime.

There are several elements in the Norwegian tax system that will produce a positive after tax effect for pensioners if the system is kept unchanged in future years. The social security contribution is lower for pension income than for income from work. Moreover, even though other tax rates are the same for income from work and for pension income, pension income that is lower than previous occupational income will be less impacted by the progressive nature of the tax rates. Finally, a specific deduction is made for tax on pension income, which has a practical meaning for pension income 6.3G and lower. Our calculations show that the after tax effect is as high as around, in average, 10 percentage points. In other words, when calculating replacement rates based on pensions after tax relative to previous average life income after tax, the replacement rate increases.

In figure 8.3 we show the average life income replacement rate before and after tax for different income groups in public and private sector for all employees (35-61 years).

Figure 8.3 Average life income replacement rate (RR-LI) before and after tax for different income groups in public and private sector. Employees 35 to 61 years.



8.3 Individual pension savings

The third pillar in most pensions systems is individual pension savings. These are saving arrangements made by individuals independent of their labour contract and pension rights in the national pension system. As in most other countries, individual savings for pension purposes are subject to favorable tax treatment and can therefore be accounted for separately from other savings made by individuals. In recent years some countries have also introduced a system in which governments top up, or match, individual savings in order to stimulate these pension savings even more. There is however, no such system of matching in place in Norway.

The importance of the individual pension pillar varies significantly across countries. In Norway individual pension savings accounts have traditionally played a marginal role in the overall pension system.

Before 2007 the individual pension saving arrangement where called "IPA" (Individual Pension Accounts) and each individual could save up to a ceiling of NOK 40 000 each year and receive a 28 percent capital tax relief. The IPA-system (for new contributions) was removed in 2006 and a new system called "IPS" was introduced from 2008. The contribution ceiling was reduced from NOK 40 000 in IPA to NOK 15 000 in IPS, i.e. a substantially reduction. This was directly linked to the introduction of statutory occupational pension coverage the same year. The old IPA pension saving scheme had a worth (insurance liabilities) of NOK 53 billion at the end of 2012, representing 534 000 insurance contracts.

The IPS scheme has been criticized because of the low ceiling of contribution. Still, the number of individual contracts for these schemes has increased from 16 000 in 2008, 29 000 in 2009,

48 000 in 2010 and 59 000 in 2011 to a total of 71 000 contracts in 2012 between individuals and a life insurance company. Because the IPS-scheme is a new system, the capital value (insurance liabilities) is rather low. By the end of 2012 the value was NOK 2.8 billion, up from 2.2 billion in 2010.

According to Finance Norway, the prevalence is limited because of three reasons. First, the tax rules are asymmetric (capital tax deduction on savings and income tax on future payments). Second, the contribution ceiling is low and third, the media coverage has been negative for several years. Because of this, the IPS-product is not being aggressively marketed by pension providers.

An individual can save in the IPS-scheme either in a bank or in a mutual fund. We do not have the number of individual contracts in banks and mutual funds, but in total pension savings in banks have been stable around a limited number of NOK 600 million the recent years.

Taken together, only around 15 percent of the population have individual pension savings accounts and the importance of these accounts are relatively marginal for future pension payments.

8.4 The importance of private wealth

The simple fact than many old age pensioners will have accesses to cash (liquidity) and significant resources tied up in private homes and cottages is of course relevant for their economic situation as pensioners.

High private wealth among some older people has inspired banks to offer specially designed products making it possible to lend money today and leave the down payments and interests to the future inheritance settlements. These products and other similar financial arrangements do not, however, seem to have gained widespread importance as a mechanism for securing income after withdrawal from the labour market among Norwegian households. The existence of these products does however illustrate the potential for income generation from private wealth.

In Norway, there are significant levels of housing capital. More than 80% of Norwegian households own their one home, making private home ownership very high in an international perspective. Historically, housing capital has been left primarily to heirs. It is, however interesting to see the potential importance that private housing and other wealth objects can have for future pensioners. Since we don't have individual data on wealth we cannot say for whom it is of most importance. A possible hypothesis is of course that high income and high pension levels are correlated with high housing wealth and other wealth categories. If that is the case it is not expected that systematic drawing on private wealth by pensioners is a solution for those with low pension income problems.

There are also other important forms of wealth, first of all cash (bank deposits) and finance capital such as savings funds and shares. Household capital is divided into two main components: Real capital and finance capital. Real capital consists of primary and secondary dwelling. Finance capital includes bank deposits, shares and other securities, share of unit trust, bond and money market funds, and foreign taxable wealth.

Table 8.2 shows that the average market value per household of a primary dwelling is about NOK 2.8 million in 2012, an increase by 10.6 percent compared to 2011. The average market value of primary dwellings is about 6 times the yearly average income (NOK 477 000 in 2012). The average market value of secondary dwellings is NOK 2.1 million in 2012. As an illustration one can very broadly say that 2.8 million will more or less be double of the total capital value of an average AFP-pension to day.

The main financial capital sources are bank deposits and shares and other securities. The average bank deposits are NOK 385 000, an increase of 8.3 percent compared to 2011, representing a total value of NOK 854 billion. Around 21 percent of Norwegian households owns shares and other securities and the average value is estimated to nearly NOK 1.3 million The total value is about NOK 658 billion. The fact that only on out of five households own shares or other securities can probably be connected to a relatively high statutory saving in national and occupational pension schemes.

In total the average household net worth is nearly NOK 2 million in 2012, up 10.2 percent compare to 2011.

The variation between households is large. First, the market value of dwellings between cities and regions can be markedly different and also between cities and between regions. Secondly, differences in value also exist between types of dwellings, i.e. between "houses" and "apartments". Third, around 20 percent of the Norwegian households do not own their own home.

When it comes to financial capital, we have shown that 21 percent of the households own shares and other securities. If we add also money market funds and bonds the number increases somewhat to 30% of the households. In other words, 7 out of 10 households do not possess this kind of wealth as a possible source of financing pension age consumption. And of course, the size of the assets also differs between households who have such assets. This also applies for bank deposits.

Taken together there is no doubt that the distribution of net wealth is unevenly distributed in Norway. According to Bureau of Statistics the highest net worth decile held almost 50 percent of total net worth in 2012 and the highest 1 percent held 18 percent of total net worth.

Not surprisingly, households where the main income earner is age 55 or higher had the highest net worth in 2012. The age group 67 to 79 years had an average net worth of NOK 3,2 million and the age group between 55 and 66 also had a net worth more than NOK 3 million. In total, more than 50 percent of all the Norwegian households had a net worth that exceeded NOK 1 million in 2012.

Table 8.2 Norwegian Households. Property account in 2012 and changes from 2011 to 2012.

	2012			2011 – 2012
	Average for households with different property holdings (NOK)	Part of household with different property code (per cent)	NOK million	Percentage change
Estimated real capital	2 782 600	81.9	5 119 020	10.6
Estimated market value primary dwelling	2 795 100	67.4	4 229 032	10.4
Estimated market value secondary dwelling	2 125 000	10.6	506 258	18.5
Taxable gross financial capital	813 900	98.9	1 806 939	5.5
Bank deposits	384 900	98.8	853 896	8.3
Shares and other securities	1 391 400	21.1	658 124	3.1
Share of unit trusts, bond and money market funds	130 700	31.7	93 133	7.8
Foreign taxable wealth	295 600	5.3	35 397	0.1
Estimated gross wealth	3 116 400	99.0	6 925 959	9.2
Debt	1 325 700	83.5	2 485 133	7.5
Study debt	185 400	23.4	97 550	6.1
Estimated net wealth	1 988 800	99.4	4 440 826	10.2
Positive net Wealth	2 550 100	81.3	4 653 874	8.9
Negative net wealth	-522 300	18.2	-213 048	-11.9
Property taxes	28 900	19.9	12 909	4.5

Chapter 9 Findings and conclusions

This chapter sums up the major findings from this study of pension coverage and future pension levels in the public private mixed Norwegian pension regime. Some concluding remarks on the future challenges for Norwegian pension policy are also presented at the end of the chapter.

In this analysis we have estimated the following indicators based on individual historical income data and prospective future income until retirement for public and private sector employees between the age of 35 and 61:

- Replacement rate compared to average life long income
- Replacement rate compared to final income
- Proportion with replacement rate (RR-LI) 2/3 or more
- Pension relative to average estimated population pension for persons born 1953
- Pension in 2013 NOK

As far as we know these are the first estimates, based on actual historical income data for the whole population, of the total replacement rates that people in Norway will see in the years to come, both from state pensions systems as well as labour marked based private schemes.

9.1 Main findings

Journalists will often ask researchers who are the winners and who are the losers in a new Norwegian pension system. However, our analysis of future pension benefits from state, occupational and labour market based pension schemes for all employees in Norway cannot be summed up in one simple finding. Rather, what we have found is that future adequacy of pensions is decided by a complicated interplay between four factors:

- Differences in career income
- Coverage of labour market and occupational plans
- The choice of age for exit from the labour market
- The age cohort to which one belongs

Taken together these four factors will decide future pension levels and replacement rates. In general, the combination of a long working career, membership in a high quality occupational plan, late exit from work and being over 50 years old today will pay off well in terms of pension accumulation. On the other hand, relatively young people today, with poor occupational pension coverage, having a short or low income career and exiting the labour market relatively early will find themselves worst off. However, even this very general conclusion is not entirely correct because pension conditions are very different for public sector employees, who have a

more generous early retirement options between 62 and 67 years and a 30-year contribution/qualifying period.

Below we explain in greater detail, breaking up our analysis into nine findings.

1 Substantial variations in pension coverage

There are three main sources of pension wealth and pension rights in Norway: the national pay as you go financed system (18.1% in yearly contributions); a system of occupational pensions for all public employees; and a labour market based collectively negotiated pension system (AFP) as well as both define benefit (DB) and define contribution (DC) occupational plans for private sector employees. A minimum occupational pension scheme is statutory in Norway (since 2006). There are major variations in coverage among employees resulting in very different total yearly contributions from these three systems varying from 20 to more than 25 percent of the annual income.

It should be underlined that individual pension savings accounts have a very limited importance in Norway. Only around 15% of the total population has an individual savings account for pension purposes. This makes access to occupational pension savings vital for the total future pension level.

While all public employees are covered by a DB scheme guarantying 66% of final salary after 30 years, including payments from the national pension system, only a small fraction of private employees are covered by similar private type 66% DB plans. In the private sector, the situation is rather the opposite since the overwhelming majority of wage earners are covered by DC plans. More than half of them are in 2% minimum plans and the rest are members of plans offering around 5% contributions each year.

In addition nearly 60% of wage earners end their working life in a company covered by a collective agreement and are thereby qualified for AFP pensions in private sector. Taken together, the breakdown of pension scheme coverage in the private sectors is as follows:

- 22% of all private employees are covered by AFP and a 2% DC plan,
- 27% are covered by AFP and a DB or a maximum DC plan
- 20% are outside the AFP arrangement but have a DB or maximum DC plan
- 31% have only 2% DC and no AFP coverage.

2. Private pensions become more important

The labour market based arrangements, and the occupational plans toping up the national pay-as-you-go system, play a major role in the overall Norwegian pension system. Looking at income composition among future pensioners, we calculate that in average around 30% of their total yearly pensions will come from these private sources. Among high income earners the private part will be higher. Moreover, because of an increasing role of occupational pensions, i.e. longer savings periods and increased savings levels, the proportion of private pensions can exceed 30% for many younger age cohorts.

In other words pension policy in Norway is developed in a public private interplay and private pension components must be a part of both pension analysis as well as pension policy debates.

3 Pension adequacy at 67 year exit age – still far from 2/3 for large groups

A natural starting point when estimating pension adequacy in Norway is to calculate lifelong payments when pension withdrawals starts at 67 years. But pension withdrawal at 67 is only one possible adaptation to a flexible pension age. In Norway, 67 years used to be the permanent pension age and still serves as a cultural or social reference point for individual pension choices and actual pension behavior. In addition, many companies still have a formal right to let people go at the age of 67, depending on the benefits available under their occupational pension scheme, even though this is under attack both legally and politically.

For those exiting work at 67 years we find that public sector employees are well protected against reduction of income in old age, receiving 2/3 of their previous final income. In reality many public employees reach this level already at 65. More than 80% of public employees will see a pension level higher that 2/3 of their average life income. Relative to the final (top) income the median replacement rate is 66.3%.

The difference between public and private sector pension plans is striking. Private sector employees will see significant lower pension levels than public sector employees when working until 67 years. Only 31% of private employees will have a replacement rate higher than 2/3 of their previous average life income. Relative to average life income private sector employees will see a replacement rate (median) of 55.7%. In other words, the average replacement rate for private sector employees is 10 percent points lower than for public sector workers. Many employees in retail, hotel and restaurants, energy and construction, real estate and other parts of private service industries will find themselves outside the AFP-system and are only covered by a 2% DC occupational scheme. In other words, even when working until 67 years many will be far from a 2/3 rate of replacement of their average life income.

However, estimates of the after tax effect on replacement rates shows that, if current tax regulations are continued there will be a strong effect on actual net pension payments. On average, replacement rates can increase by up to 10 percent points when calculating pension payments after tax, relative to previous average life income after tax.

4 Return on the DC pension capital becomes increasingly important

The level of return on the DC pension capital is vital for the future pension level accumulated in the DC-plans. For individuals born in 1975 covered by a DC plan, an increase in return of 2 percent points (4.4 to 6.4%) a year will raise the replacement rate (RR-LI) by 46%. Individuals born 1975 who are covered by a max DC-plan (5 and 7%) can have a replacement level from their DC occupational plan alone of 14.6% if the yearly average return is 6.4%. If the return falls back to 2.4%, the replacement level will be only 6.9%.

5 Life-expectancy – risk transfer to younger age groups

One of the most striking results from this analysis is the impact of increased life expectancy mechanisms found in both public and private pension arrangements on future pension levels for younger age cohorts. Life-expectancy pension reductions are found in the national pension system, the labour market based AFP scheme and in public sector DB schemes as well as de facto in the terminating DC occupational plans (77 years).

We estimate strong reductions in replacement rates among the younger age groups for all sectors and industries, gender and income levels. While the income of the 1953 age group is very

well secured when entering the retirement phase, we find that persons born between 1965 and 1975 will experience significantly lower pension levels than the older age cohorts. Only one out of five private sector employees born in 1975 will see replacement rates of 2/3 or more at 67.

Among private sector employees the average replacement rate relative to life income drops from 69.5 for those born in 1953 to 57.4% for those born 1975 (exit at 67).

Longer accumulation in DC plans for younger generations does not compensate for lower national pension benefits due to life expectancy adjustment. Nor will working to 70 years generate the same replacement rate as the 1953 cohort had at 67.

These findings indicate that there is a distinct individual savings need among several groups if working careers are not extended beyond the age of 67. An alternative to individual savings is converting reals estate or other wealth objects into pension income. One should however be aware that some of the groups with lower pension levels probably have less individual savings capacity and less private accumulated wealth than others.

6 There are redistributive effect built into the pension system

In Norway total estimated pension income is far more evenly distributed than income from work.

The national pensions system has a significant redistributive effect, among other things due to a relatively high minimum guarantee in the national pension system.

Occupational pension plans, however, tend to reproduce income differences found among wage earners. The labour marked based contractual pension schemes, AFP, covers only half of private sector employees and hence contributes to income differences among future retirees.

7 A low pension problem?

Pension income in Norway is guaranteed at a minimum level higher than the standard household unit poverty level according to the OECD definition.

If a low pension is calculated as 50% of median personal income in the total population, only around 9% will have a future pension payment lower than this level at 67 year retirement. The highest proportion of future pensioners with low income is found among women in private sector service industries where 18% will be low income pensioners.

Risk of having a low pension level at 67 year labour market exit will be higher for younger age groups than older due reduced pension benefits following longer life-expectancy.

8 Retiring early is not for all

Our analyses show that relatively large groups will not qualify for pension withdrawal at 62 years. For the 1953 age group, one out of four needs to earn more pensions rights in order to qualify for pension withdrawal. For persons born in 1975 one can expect that as many as four out of ten cannot qualify for exit at 62 years. This is an accurate and interesting empirical finding. It is however open for discussion whether this constitutes a social policy problem. In the old national pension system there were no early retirement possibilities before 67 years. The

new minimum pension age of 62 must not necessarily be seen as an entitlement to retire, but as an opportunity if pension accumulation is high enough.

Public employees will have relatively high pension levels on average even when retiring at 62 years. More than 80% will see a benefit level (RR-LI) 2/3 or more. This is a unique feature of the occupational pension system in the state and local sector.

Only 7% of private employees will have accumulated a pension level of 2/3 or more if retiring at 62. For the private sector employees replacement rates when exiting at 62 years will become low, namely at a level of 46% of life income and 44% of final income in average.

9 Retiring later is a good idea

If working careers are extended until 70 years pension levels will increase significantly, primarily among private sector employees.

Looking at variation in pension coverage a clear picture of pension winners and looser becomes visible. By working until 70 years even younger age groups covered by AFP and a good occupational scheme can reach pension levels of 80% of average life income. On the other hand, for those in the same age groups who are covered by only national pensions and DC 2% schemes an extension of working life until 70 years will still leave them with replacement levels under 60%.

When working until 70 years the significant differences between public and private sector employees are reduced through a higher pension return for private sector workers than among public sector employees when the former extend their careers. Private sector workers exiting at 70 years can receive nearly the same pension levels as public employees if they are covered by AFP and are member of a relatively generous occupational arrangement.

10 The fall back option – for those who have

Private wealth constitutes an important possibility to finance consumption during old age. The result will be less transfer of economic wealth to the next generation. In a time of economic growth this is not necessarily a problem because future generations can be expected to have higher income than their parents. Even so financial products that shift private wealth into consumption among older people have had very limited importance in Norway.

There is nevertheless a relatively large potential for using private wealth to finance consumption in old age. In Norway more than 80% of the household own their own home. Households where the main income earner is age 55 or higher have the highest net worth of wealth. However, due to the very uneven distribution of private wealth, this is not a viable mechanism of solving a possible low pension income problem.

9.2 Concluding remarks

The recent reform of the Norwegian national pensions system has obviously had substantial impact on future pension levels and economic incentives for work and for the ability to freely combine work and pension after 62 years. Moreover, the pension reform also tells us that post-

war ambitions of providing income security at 2/3 of previous life income only through a tax-financed pay-as-you-go state system, is history. Today it is clear that labour market based occupational schemes will continue to have an important role in the overall Norwegian pension system. The growing importance of occupational pension schemes makes it essential to understand the impact on future individual pension levels and on the public private institutional pension mix. The new public-private interplay in the pension system also involves the labour market actors as core players in pension policy, both through tri-partite cooperation as well as through governance of the occupational arrangements in the labour market.

Governments and the social partners face several policy challenges in the years to come. We shall briefly point to five of these resulting from our analysis of future pension conditions in Norway.

1 The public-private pension gap

Our analysis shows a distinct difference between public and private employees with respect to their pension accumulation and pension rights. First, for public employees there is an opportunity to retire early with generous economic conditions. Second, pension levels and replacement rates at 67 years (65) are markedly higher for public employees than for private employees. Finally, the effect of extending work careers has a much smaller pay off for public employees than among private sector employees: at exit from work at 70 years of age most of the previous differences in replacement rates have disappeared.

These elements of the public occupational system create very different incentives for extended working careers than found in private sector and this can have impact on individual decisions of shifting work between the two sectors of the labour market.

Our analysis shows that a maximum DC system in combination with AFP can produce the same pension levels as the current public sector occupational system. If work careers for state and local employees becomes longer in the years to come this kind of savings based systems can create even higher pension levels.

A key challenge is how to transform the right to withdraw early (62-65/67) into a savings bases system where the economic risk of early exit is transferred to each individual. Reforming this system is complicated because individual self-interests are very different for persons who plan to retire early or for those who plan to work longer

2 A private sector occupational pension reform?

Pension accumulation and the building up of pension rights in private sector in Norway have three distinct features. First, most occupational arrangements are now DC plans: the DB-arrangements play a marginal role, covering only 300 000 employees of which half of them are in closed plans (no new members accepted). Second, there are relatively large variations in savings and contribution levels in the occupational plans across industries and socio economic groups. Third the AFP scheme covers only half of all private sector employees and in this system a person qualifies for a benefit only if he or she has employment in an AFP covered company at 62 years. In other words, it is possible to have absolutely no payments from the AFP scheme if one drops out close to retirement, for example because of layoffs and new work is found in a non-covered sector.

The policy challenge for the social partners is to reform the AFP scheme in order to secure the AFP as a predictable building block for the occupational pension plans in Norwegian companies. This means that employers and employees must be sure that AFP-pensions actually will be paid out when those people currently covered reach pension age. If not, they will find it difficult to calibrate and design savings levels combining AFP and occupational plans.

Second, broader AFP-coverage can be achieved through expanded us of collective agreements in the work place or through improved systems of legal extension (i.e. extending legal rights originating in collective agreements to employees in other companies, usually in the same sector). On the other hand, the current system with a more limited coverage could be seen as a state subsidy through the state contribution to the financing of the AFP-scheme given to companies being part of an organized working life typically found, and preferred in the Nordic countries (NOU 2013:13 , Dølvik 2012). This is a relevant argument in favor of the current system.

Finally, the social partners can seek to reduce the differences in savings levels. Again, the strategic options are different. On could advocate higher regulatory minimum demands, for example from 2 to 3% in yearly savings in DC plans. Alternatively new collective agreements could be concluded securing increased pension savings for groups covered by collective agreements. It is, of course, also possible that the pension rights could simply be seen as a natural consequence of a marked based economy.

3 Are people prepared to take the increased economic risk?

As already concluded, one of the striking results from this analysis is the impact of increased life expectancy on future pensions for younger age cohorts. There will be strong reductions in replacement rates among the younger age groups for all sectors and industries, gender and income levels. Only one out of five private sector employees born in 1975 will see replacement rates of 2/3 or more at 67 and working to 70 years provides only what the 1953 cohort had at 67.

One could ask if this effect actually has been broadly understood. Have individuals integrated this new reality in the way they plan for a distinctly longer working career or in the way they save to finance a possible income gap that will become visible later? For the authorities this is a multifaceted challenge. It has to do with the development of information strategies and how people can be made aware of and ready for this. And it can produce an individual savings need among several groups if working careers are not extended beyond the age of 67. An alternative to individual savings is, of course, converting reals estate or other wealth objects into pension income. One should however be aware that some of the groups with lower pension levels probably have less individual savings capacity and less private accumulated wealth than others.

4 A need to reform employment policies and age limit regulations

If people increasingly are willing to work longer it will cause a challenge for employment policies and labour market regulations. In order to have people working more and longer in their sixties, job opportunities must be there. We cannot go into detail here, but it is important to stress the significance of such a trend to the ability of to traditional macro-economic policies and active employment measures to secure future job growth and employment. In this regard, current international developments indicating stable high unemployment and even reduced employment levels are especially worrying.

Moreover, the fundamental reform of pensions systems demands a corresponding shift in attitudes among employers regarding recruitment and work opportunities for older persons. In Norway analysis shows a positive development in attitudes towards older people and work (Seniorpolitisk barometer 2013). But, in order to match the need to work up to and even beyond 70 years, bigger shifts in both attitudes and practice will be needed.

Finally, since the 2011 reform, there is a flexible age of retirement from the state pension between 62 and 75 years old. People can freely combine pension and work. From the age of 70, employers can end working contracts. 70 years is the age limit defined in the Work-life Environment Act (AML). Individuals can, however continue working and accumulating pension rights until the age of 75. In many companies, contracts are usually ended at age 67 due to accepted historical traditions (67 was the official age of retirement before the reform).

Public sector workers can retire with a full pension after 30 years of contributions at age 67. They can also enter an early retirement scheme from 62 until 65 or 67.

It is probably clear that regulations of age limits and job security are in need of rapid reform. The problem is that there might be a tradeoff between how far upwards the general pension age can be moved and the level of individual employment protection.

5 Is the window of flexibility too wide?

Formally there is a window of flexible opportunities to combine pension and work all the way from 62 to 75 years in Norway. If employment and labor markets policies are successful and individual labour market behavior actually changes according to political ambitions, we will see a 13 year long time period were individuals will have a unique potential freedom to be neither a worker nor a pensioner, but be one or the other based on his or hers likings. Today this window is in practice open basically from 62-67 years and we have no actual experience with a far longer time span.

A long window of flexibility can cause several problems. First, the fact that relatively large groups do not qualify for exit at 62 years can cause discussion and be seen a social policy problem. In the old national pension system there were no early retirement possibilities before 67 years and the pension age of 62 can be seen only as an opportunity to retire if pension accumulation is high enough.

Second, one can ask if it is a good solution to keep the lowest pension age constant at 62 when life expectancy will strongly increase. This will make the potential retirement period institutionally longer and longer even if the pension system financial is neutral.

Third, it will probably be demanding for employers and for the social partners to regulate and govern the flexibility that individuals will see when reducing daily working time, taking out time blocks as free time or looking for the extended holiday.

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An analysis of future benefits from public and private pension schemes

The report asks a quite simple but technically advanced question: Are people saving enough for their retirement? The recent reform of the Norwegian national pensions system and the growing role of occupational pension schemes make it increasingly important to understand the impact this will have on future pensions. Based on actual income data for the Norwegian population future pensions payments are estimated for national pension (folketrygden), occupational pensions and for AFP-arrangements. The report identifies both the future income composition and the total pension level people will accumulate through their working years. Calculations are conducted for different labour market exit ages as well as for various age cohorts. This report is the Norwegian country study to the OECD pension adequacy project.

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P.O.Box 2947 Tøyen
N-0608 Oslo
www.fafo.no/english/

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