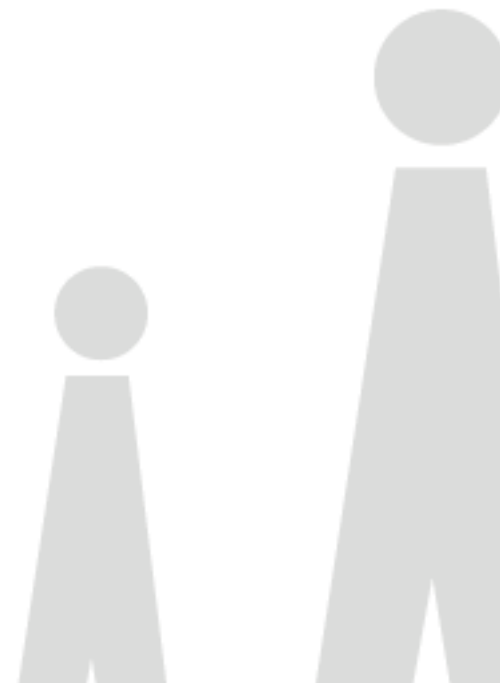




Pension Reform in Norway – A European Perspective

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Contents

1	Introduction.....	1
2	Demography in Norway in comparison to other European countries	2
3	Reforming pension systems – the situation of Norway in a European context.....	5
3.1	Change of the entire pension system.....	5
3.1.1	Norway	5
3.1.2	Sweden	8
3.1.3	Poland.....	10
3.2	Gradual changes in the pension system.....	12
3.2.1	Finland	12
3.2.2	Germany	16
3.2.3	Austria	17
3.2.4	Spain	20
3.2.5	France	22
3.2.6	United Kingdom.....	23
3.3	Minor changes in the pension system.....	25
3.3.1	Denmark	25
4	Measuring sustainability	26
4.1	The methodology of Generational Accounting	26
4.2	General assumptions and data description.....	27
4.3	A first overview of sustainability in European pension systems	29
4.4	Sustainability gains of pension reforms in comparison	30
4.4.1	The overall impact.....	30
4.4.2	Who bears the burden?.....	34
5	There is more than sustainability – on the issues of measuring adequacy	36
5.1	Starting point: the overall economic situation of elderly persons.....	36
5.2	Measuring adequacy	40
5.2.1	Concepts and critical remarks	40
5.2.2	What can replacement rates tell us? – An intertemporal comparison.....	43
5.2.3	Generosity of pension systems	44
6	Conclusion	49
	References.....	51

1 Introduction

The Norwegian pension reform which came into effect in 2011 was preceded by intense discussions and a long reform process. Now, after three years with the new system in place, one wonders about the effects the reforms have had. Thus, several evaluation projects are under way. The focus is thereby on the effects on retirement behavior or on different groups of persons, for example men and women or younger and older generations.

To complement these studies the Norwegian pension system can be looked at from another perspective. In past decades pension reforms have taken place in almost every European country. Of course, reform measures were different and effects were larger in some countries than in others. Still, an international perspective might render valuable insights. This international perspective will be taken in the following. Thereby, the focus will be on two very important goals for pension systems: sustainability and adequacy. These two concepts are interrelated and may sometimes even interfere with each other. It is necessary to take the broadest view possible because looking at sustainability only can be very misleading. In the following study suitable indicators to measure sustainability and adequacy will be applied to empirically evaluate pension systems. Thus, the effectiveness of the Norwegian pension reform can be compared to reforms in other European countries. Furthermore, it will become visible how European pension systems will perform in the long run.

A comparison between different countries can replace setting up artificial counterfactual scenarios. An interesting question might be for example: What would the situation of the Norwegian pension system be like if there was no petroleum wealth? What would happen if population ageing was more severe? What would have been the effects if different reform steps had been taken? Of course, an international comparison cannot give exact answers, but still, there might be some important and valuable insights. Often one can draw conclusions for oneself from experiences others have already made.

Focusing on an international comparison the subsequent parts of the report will be organized as follows: In most countries population ageing was one of the driving forces for reforming pension systems. Yet, demographic developments differ across countries. This is shown in section two. Having looked at the motives for pension reforms, the third section

presents details on pension systems and recent reforms. This section is divided into three parts, according to the extent of reforms. With good knowledge of the different pension systems one can turn to the empirical evaluation in sections four and five. Section four will deal with different measures of sustainability while in section five the focus is on adequacy. Above, it has already been mentioned that it is important to take into account both measures to get a complete picture of the performance of pension systems. The concluding sixth section offers some reflections on the joint performance of these two outcome indicators and the difficult trade-off between them.

2 Demography in Norway in comparison to other European countries

An international comparison of all relevant demographic developments and their parameters would be a study of its own. Therefore we focus in the following on two main drivers: Life expectancy and fertility.

With regard to life expectancy the story to be told is fairly simple: Every country in our sample has faced an increase in life expectancy during past decades and this development is very likely to be continued. The countries differentiate slightly when it comes to levels or the rate of increases; but overall, numbers are quite close to each other. Life expectancy at birth for women was between 80.1 years in Poland and 84.7 years in Spain. As regards men, life expectancy was shortest in Poland with 71.7 years in 2010 and longest in Sweden with 79.4 years. Thereby, Norway ranges close to the upper end with life expectancy at birth for men of 78.7 years in 2010. In the case of women Norway is mid-table. According to projections by Eurostat, in 2060 life expectancy for women will be between 87.9 years in Poland and 90 years in France. At that time men with the longest life expectancy (85.5 years) will live in Sweden, while life expectancy will only be 82.4 years for men in Poland. Thus, differences between countries are projected to decrease over coming decades.

Table 1: Life-expectancy at birth

	Male		Female	
	2010	2060	2010	2060
Austria	77.6	84.8	83.0	89.1
Denmark	77.0	84.4	81.1	88.4
Finland	76.6	84.4	83.2	89.2
France	77.9	85.1	84.6	90.0
Germany	77.6	84.8	82.7	88.9
Norway	78.7	85.2	83.1	89.2
Poland	71.7	82.4	80.1	87.9
Spain	78.6	85.4	84.7	89.9
Sweden	79.4	85.5	83.4	89.3
United Kingdom	78.3	85.2	82.4	89.1

Source: EUROPOP 2010, own illustration

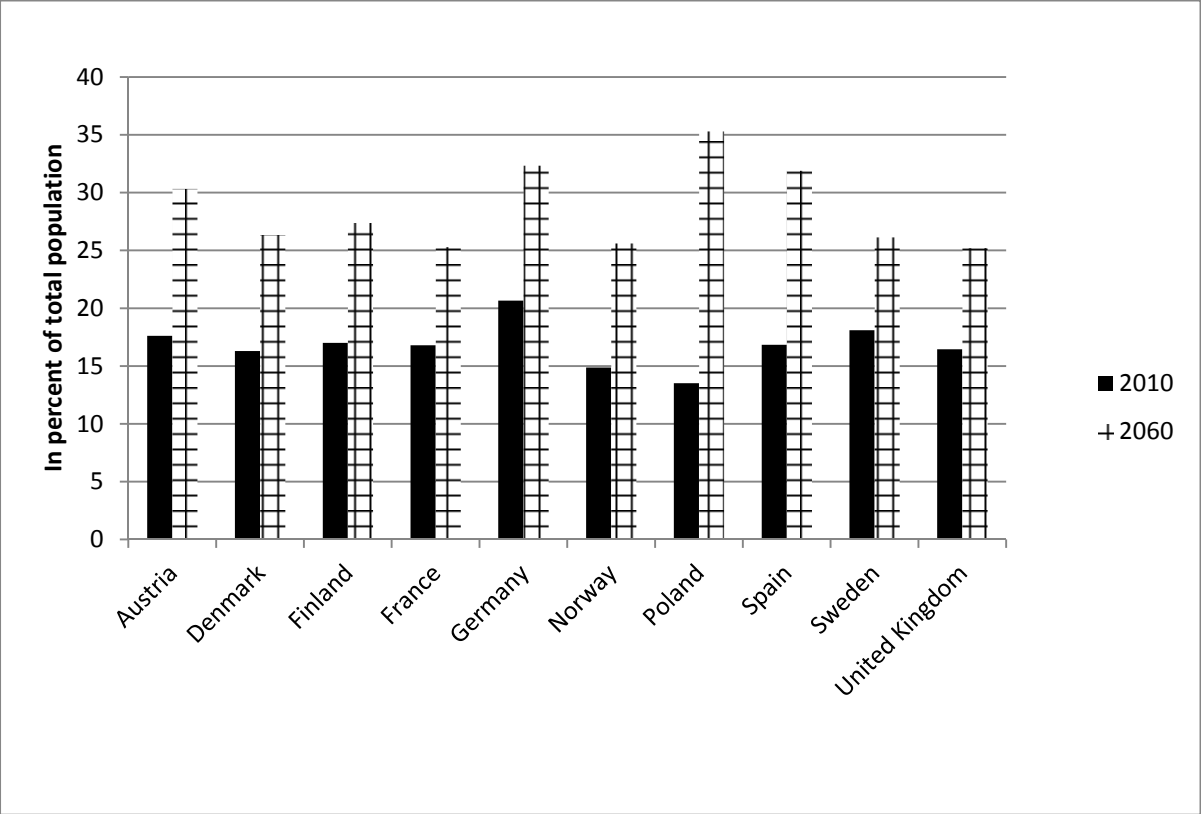
In the development of fertility rates there were some trends visible in almost every country. For example, fertility rates were low almost everywhere during the Second World War. This left marks on population structure, but in some countries fertility rates recovered fairly quickly, for example in Denmark, Finland, Poland, Sweden and in the United Kingdom. Afterwards almost every country experienced a baby boom resulting in overall high fertility rates in the 1960s. For example, Norway experienced a fertility rate of almost three children per woman. Most countries faced sharp declines in fertility rates following the baby boom, which was followed by a quick and substantial recovery only in the Nordic countries, in France and in the United Kingdom. These developments divided our country sample in two groups: In the high-fertility group consisting of Denmark, Finland, France, Norway, Sweden and the United Kingdom, rates were between 1.9 children per woman in Finland and 2.0 children per woman in France. The remaining countries form the low-fertility group with around 1.4 children per woman.

As demographic development is mainly formed by the factors described above¹, consequently, future trends will be quite distinct in the different countries. Today, Norway has the lowest proportion of elderly people in Nordic countries. Only in Poland the share of

¹ Of course, migration is another factor with large influence. As forecasts about migration are highly speculative, this factor is not looked at in detail here. For the assumptions on migration applied later in our calculations see section 4.2.

elderly people is slightly lower. Despite the fact that there will be more and more citizens above the age of sixty, Norway will keep its position in the top bracket. In 2060 the countries with the lowest share of elderly people will be the United Kingdom, France and Norway, followed closely by Sweden, Denmark and Finland. Around one third of the population will be 65 years and older in Austria, Spain, Germany and Poland in 2060. Thereby, the case of Poland catches the eye as this country had the lowest share of elderly people in 2010. Over the coming decades, this share will rise sharply resulting in the share of elderly people being more than two and a half times larger in 2060 than it was in 2010.

Figure 1: Share of elderly people in 2010 and 2060



Source: Own calculation based on EUROPOP 2010

3 Reforming pension systems – the situation of Norway in a European context

Pension reforms have been on top of the political agenda in almost every European country for more than a decade now. Some countries reacted early to upcoming challenges due to ageing populations and started with reforms in the beginning of the 1990s already. However, in most countries the reform process speeded up after the turn of the millennium. Countries differ not only as regards the timing of reforms but also according to the extent of reforms. Here, three patterns can be distinguished: A few countries changed the entire pension system at once, e.g. by moving from a defined-benefit to a defined-contribution system. However, most countries enacted gradual reforms. Denmark is the only country in which the public pension system has remained fairly stable.

3.1 *Change of the entire pension system*

3.1.1 Norway

With 4.86 million inhabitants as at 1st January 2010² Norway is the most sparsely populated country in our sample. The national currency, the Norwegian Crown, had an exchange rate of 7.8 NOK to the Euro at the end of 2010. Thus, GDP of 2,544.27 bn. NOK corresponded to 317.86 bn. Euros. GDP per capita amounted to 520,400 NOK or 65,000 Euros.

General characteristics of the pension system

The new Norwegian pension system started to take effect in 2011. The benefit plan of the new system consists of a guarantee pension and a public earnings-related pension system.

The guarantee pension was adapted from its Swedish counterpart and its amount is equivalent to the minimum benefit provided by the pre-reform system. To be eligible for a guarantee pension a period of residence of at least three years is required. To get the full amount, 40 years of residence are necessary; a proportional reduction is applied for every year missing. The guarantee pension can be claimed from the age of 67 at the earliest. Income pension is counted against guarantee pension at a rate of 80 percent. The guarantee

² We display country data for 2010 since this is a main base year for our calculations.

pension is updated annually in accordance with wage growth minus the effect of the life expectancy adjustment.

The new public earnings-related pension system is of the notional defined contribution type. The pension system is a pay-as-you-go (PAYG) scheme fully integrated with the state budget and financed out of a mixture of general taxation and employer and employee social security contributions. Each year an amount equivalent to 18.1 percent of income from earnings up to a threshold of 7.1 times the basic amount³ is credited to an individual notional pension account. The accumulated holdings on these accounts are updated annually in lockstep with average wage growth. Furthermore, there are credits for e.g. periods of raising a child, caregiving or military services. Entering into retirement is possible between 62 and 75. When a person retires, entitlements are converted into a lifetime pension payment. The calculation is based on the age at retirement entry and the average life expectancy of the respective cohort.⁴ The take up of pension benefits can be combined freely with full-time or part-time employment. Income pension is updated annually according to wage growth minus 0.75 percentage points.

Besides these components of the public pension system, about 50 percent of all private sector employees are covered by an AFP-arrangement, which from 2011 on is a lifetime top-up of public earnings-related pension. Benefits can be drawn from age 62 on actuarially neutral terms as in the public system. They are adjusted to life expectancy.⁵

Since 2006 occupational pensions are mandatory. Employers can decide freely whether they provide occupational pensions through defined contribution or defined benefit systems. Benefits have to be paid for at least ten years from the age of 67.

Recent reforms of the pension system

As the reformed pension system has been in place since 2011 only, the old system is still quite important. It consisted of a basic pension and an earnings-related supplementary

³ The basic amount was 75,641 NOK per year in 2010.

⁴ Based on life expectancy at the age of 61 a cohort-specific divisor is calculated on actuarial neutral terms which is then applied to the individual age at retirement.

⁵ Please note that because the AFP scheme is not a mandatory public system, it will not be part of our calculations in following chapters.

pension. If a person had lived in Norway for at least 40 years, the full minimum pension was paid. For shorter periods of residence, benefits were reduced proportionally.

To calculate the earnings-related pension the number of pension-earning years and yearly pension points were taken into account. A full pension was accrued after 40 years; it amounted to 42 percent of the current basic amount times the average pension points for a person's 20 best income years.

For those born in 1953 and earlier the old scheme applies only. Persons born in 1963 or later are entirely covered by the new pension system. Those born in between are covered by both systems. For persons born in 1954 benefits according to the old system account for 90 percent of the overall benefits, benefits according to the new system account for 10 percent. The share of the old system diminishes over time whereas the other one grows, until the old system makes up 10 percent of the overall pension and the new system accounts for 90 percent for those born in 1962.

In 2011 modifications of the disability benefit system, which became necessary in the course of the implementation of the pension reform, have been decided. At the age of 67 disability pensioners are transferred to the old-age pension system, but accrual of pension rights now stops at the age of 62 instead of 67. This results in an old-age benefit for disability pensioners that is about 10 percent lower compared to pension benefits of someone who continues to work until the age of 67. As disability pensioners are not able to compensate the effect of the life expectancy adjustment factor by working longer, they will be partially shielded by putting a limit to the adjustment effect. This will significantly reduce the effects of the pension reform.⁶

Besides the far-reaching reform in public pensions a major reform took place in the AFP system. Until 2010 AFP was an early retirement scheme paying pensions from the age of 62 until the age of 67. The amount of benefits was as high as pensions a person would have been eligible to had he worked until the age of 67. Thus, it made possible to retire early without any reductions in the pension amount. The old AFP-scheme is still in place in the

⁶ Unfortunately, in our calculations it is not possible to distinguish between persons entering retirement from the disability system and those having worked until retirement. Therefore, we cannot incorporate in our calculations the effect of the decision to shield former disability pensioners from life expectancy adjustment.

public sector (i.e. for state and municipal employees) and hence a significant share of the Norwegian workforce continues to face strong incentives for early retirement.

3.1.2 Sweden

Sweden had a population of 9.34 million inhabitants as of January 1st, 2010. The national currency is the Swedish Crown (SEK), which had an exchange rate of 8.9655 SEK to the EUR at the end of 2010. The GDP in Sweden was 3,337.53 bn. SEK in 2010, equal to a value of 349.95 bn. EUR. This corresponds to a per capita GDP of 355,900 SEK or 37,300 EUR.

General characteristics of the pension system

As it is the case in Norway, in Sweden a minimum living standard is provided through a guarantee pension. Being eligible for a guarantee pension is tied to a residence period of at least three years. The full amount is paid after 40 years of residence; every missing year leads to proportional reduction. Up to a threshold, the income pension is counted against the guarantee pension at a rate of 100 percent; thereafter, the rate is reduced to 48 percent. The guarantee pension can be claimed from the age of 65⁷ and it is indexed annually to the development of the consumer price index (CPI). In contrast to the regulations in Norway, increases in life expectancy are not taken into account.

The income-related pension scheme is composed of two pillars, a public notional defined pay-as-you-go scheme and a privately managed fully funded defined contribution scheme. There is no discrimination between privately and publicly employed workers; both groups are covered by the same social security system. This system has been in place since 1999 and it served as role model for the Norwegian reform in 2011. The public income-related pension scheme is based on notional pension accounts, into which contributions⁸ of employees and employers are credited.⁹ Contributions are calculated as 14.88 percent of income from earnings up to a threshold. For every person insured contributions are credited in the individual pension accounts and they are indexed annually according to average wage

⁷ Whereas in Norway the minimum age of the claimant is 67.

⁸ Contributions are paid into one of the four Swedish public pension funds which are responsible for payments of pension benefits. Moreover, investment income of the funds contributes to financing and stabilization of the earnings-related pension system.

⁹ The accumulated entitlements are augmented by compensations for periods without employment for particular reasons, e.g. childbirth.

growth.¹⁰ Claiming the earnings-related pension is possible from the age of 61 already. Then entitlements are converted into a lifetime pension payment through division by an annuity divisor. The annuity divisor is specific for every cohort and reflects remaining life expectancy¹¹ when entering retirement. If a person retires before turning 65, the divisor is recalculated at the age of 65, thereafter it stays constant. Besides life expectancy the annuity divisor also contains an interest rate of 1.6 percent which causes the divisor to be less than life expectancy. That in turn leads to an initially higher pension. During retirement, benefits are updated in line with wage growth minus 1.6 percent. Furthermore, the Swedish pension system has a built-in automatic balancing mechanism, which ensures that at any time assets of the pension system suffice covering liabilities.¹²

Another 2.33 percent of earned income (up to a threshold) is paid into the fully funded premium pension system.¹³ Everyone can choose by himself the funds he wants to invest in.¹⁴ Investments evolve in accordance with the development of the fund and are therefore exposed to the risk of fluctuations. When retiring, a choice can be made between converting entitlements into an insurance or keeping them in the fund.¹⁵ The amount of the pension is calculated by taking into account expected remaining life expectancy.

Recent reforms of the pension system

Before 1999 the Swedish system was a combination of a flat-rate pension called folkpension and an earnings-related part which was defined benefit as opposed to the new defined contribution scheme. Benefits were calculated as a proportion of the average wage of the best 15 years of the working career. Full eligibility was achieved with 30 years of covered earnings at age 65; maximum pension age was 67.

¹⁰ Additionally, for every person of an age cohort a share of pension entitlements of cohort members having died through the course of the year is credited.

¹¹ This is calculated as an average for men and women.

¹² If this is not the case, indexation of entitlements and pensions paid is reduced until balance is restored.

¹³ Please note that according to the definition of pension systems taken into account premium pensions are neglected in further calculations of this report.

¹⁴ If a person does not choose one or several funds of his own, the money is invested into a public fund composed of bonds, domestic and foreign equities.

¹⁵ In case pension savings remain in the fund, benefits are recalculated annually based on the value of the fund. This means that the exposition to capital market risks remains during retirement. If entitlements are converted into an insurance, funds are sold and the Swedish Pensions Agency takes over the financial risk.

The system is currently – until 2015 – in a transition period. People born 1937 or earlier are still in the old system with the exception of the guarantee pension system, in which the new regulation is already applied. People born in 1938 receive 80 percent of their pension from the old system and 20 percent from the new one, with accounts being created from historical files. The share of the new system payments increases by five percentage points per year up to birth year 1953. All people born 1954 or later are fully covered by the new system.

3.1.3 Poland

Poland is the third largest country in our sample as regards population with 38.17 million inhabitants. It became a member of the European Union in 2004. Yet, the national currency still is the Polish Zloty (PLN). The rate of exchange to the Euro was 3.975 PLN at the end of 2010. GDP in 2010 amounted to 1,416.59 bn. PLN which corresponded to 354.62 bn. EUR. Per capita GDP was 36,800 PLN or 9,200 EUR.

General characteristics of the pension system

The Polish system is split into three different parts: There are institutionally distinguished schemes for private sector employees, farmers and a number of civil servants groups which are all financed at least in parts out of the official budget. The private sector scheme is the only one relying significantly on contributions, a defined contribution scheme by now.

At the moment the Polish pension system is in a transition phase after the reform of 1999 which changed the general pension system from a defined benefit scheme to a notional defined contribution (NDC) scheme. Until 2011, the pure new scheme applied to all workers born after 1968 and was designed as follows: Contribution was defined at 19.52 percent of gross earnings with payment equally split between employers and employees. 12.22 percent were credited to individual accounts at the central insurance institution (ZUS) with a rate of return equal to the wage sum growth of that year after controlling for inflation. The remaining 7.3 percent were invested into private funds with an individual and variable market rate of return.¹⁶ As contributions to this system only started in 1999 there was an account value set for all people employed at that time to represent their contributions up to

¹⁶ This part of the pension system is often referred to as the FDC-part.

1998. After retirement, account values are converted into an annuity which is based on the average unisex life expectancy of the age group at the age of retirement. Workers born before 1969 could decide whether or not to take part in the funded part of the new scheme. People born before 1949 receive their pension still from a defined benefit scheme, which grants them 24 percent flat of the average wage. This amount is incremented by a proportion of an average out of the best ten years in a row chosen from the last 20 years of working. The proportion is 1.3 percent per year of contribution. If pension benefits fall below some defined threshold there is a supplement paid out of tax accounts. In general, existing pensions are indexed with the inflation rate plus 20 percent of real wage growth.

Recent reforms of the pension system

In 1999 the whole Polish social security system and with it the pension system underwent a fundamental reform. Before 1999 there was a monolithic contribution rate of 36.59 percent to all social security schemes which did not take into account the burdens of the different institutions. The system was defined benefit, granting workers a percentage of the average of their best three years in a row as a pension. Whilst today there are no institutional early-retirement plans, there were possibilities of retirement as early as at 55 years of age in some cases. Due to perceived immediate necessity of reform there was practically no transition period. Only people born before 1949 are exempt from the new rules since they had already acquired considerable claims in the old system.¹⁷

Mainly due to public budget constraints, in May 2011 the government changed the proportions of contributions transferred to the different pillars. The FDC part was lowered to 2.3 percent with the remaining five percent going to a second NDC scheme which is indexed to the average nominal growth of GDP in the past five years. Contributions to the funded part were legislated to rise again until they reach 3.5 percent from 2017 onwards.

In 2012 statutory retirement age for men and women insured in the NDC/FDC system was legislated to gradually rise from 60 to 67 from 2013 until 2040 (for women) and from 65 to

¹⁷ A detailed description of the NDC system in Poland can be found in Chlón-Dominczak and Góra (2006).

67 from 2013 until 2020 (for men). The retirement age will be increased by three months each year.¹⁸

Finally, in 2013 further reforms were adopted including the following changes:

- Fixing the FDC contribution rate at 2.92 percent without any future changes.
- Taking over 51.5 percent of FDC assets by the general government and recording them on the second NDC scheme.
- The FDC scheme will no longer be obligatory.
- A new mechanism of the FDC related pensions will be introduced: For ten years before reaching the statutory retirement age the FDC assets will be cashed in pace of 10 percent annually and gradually cumulated on the respective individual second NDC account.

FDC systems must not purchase government bonds, their portfolios by law will turn more stock oriented, mainly focusing the Polish stock exchange, with limited possibilities to invest abroad.

3.2 Gradual changes in the pension system

3.2.1 Finland

Finland has a population of 5.35 million inhabitants as at January 1st, 2010. The national currency is the Euro since Finland is one of the twelve countries which introduced the Euro currency on January 1st, 2002. GDP in 2010 added up to 178.72 bn. EUR; this corresponds to a per capita GDP of 33,300 EUR.

General characteristics of the pension system

In Finland, almost all gainful employment is covered by pension provision. Self-employed persons, farmers, seamen and public-sector employees have their own pension acts. The public pension system (the first pillar) is made up of three statutory pension schemes: a guarantee pension, the national pension scheme and an employment-based, earnings-

¹⁸ Nevertheless, the reform leaves unchanged special privileges granted in past decades, e.g. to miners, teachers or pre-retirement beneficiaries.

related pension scheme. The schemes for private-sector employees are partially pre-funded while the public-sector schemes are PAYG financed.

Voluntary pension contracts are not very common in Finland compared to many other European countries. The reason for this is, among other things, that the statutory earnings-related pension scheme has no upper limit for pensionable earnings or for pension benefits. In 2010, pensions for voluntary individual schemes represented only about one percent of all pension benefits but about fifteen percent of working-age population was insured in these schemes. Voluntary pension insurance may become more and more important in the future as benefits from earnings-related pension schemes decrease due to the life expectancy coefficient.

The statutory schemes are closely linked together, with the amount of guarantee and national pension depending on the size of earnings-related pension benefits. Increases in the earnings-related pension reduce the national pension by 50 percent of the increase in the earnings-related pension. If the earnings-related pension is above a defined level, the national pension is not paid at all. Therefore only about half of pensioners who receive an earnings-related pension also receive a national pension. At the same time there are 100,000 pensioners getting national pension only.

Guarantee pension came into force on March 1st 2011. If a pension recipient's national and earnings-related pension amount is less than the lower pension income level set by law, the difference is paid from the guarantee pension. Pension income decreases the guarantee pension in full, more steeply than in the case of national pensions.

The national pension is paid to those with small earnings-related pensions or none at all. National pensions are paid to persons who have lived in Finland for at least three years after reaching the age of 16. If the residence period is less than 80 percent between the age of 16 and the beginning of retirement, benefits are proportioned to the time of residence in Finland. Claiming the national pension is possible from the age of 65 without reductions and from 62 with reductions.¹⁹ National pensions are flat-rate benefits, financed through taxes

¹⁹ Reductions amount to 0.4 percent for each month the pension is taken before the age of 65. Benefits are incremented by 0.6 percent for each month the pension is delayed after the 65th birthday.

and contributions. National pensions in payment are adjusted annually according to the national pension index.²⁰

The financing of earnings-related pensions is a combination of a fully funded and a PAYG system based on pension contributions from both employers and employees. The pre-funded scheme covers approximately one quarter of earnings-related pension outlays; the rest is financed through the PAYG system. The pre-funding is collective in the sense that it actually has no effect on the size of the pension. The main purpose of the pre-funding is to smooth pension contributions in coming years.²¹

The earnings-related pension scheme consists of several pension acts, which together cover the different sectors of the economy. In practice, all work between 18 and 67 years of age, as employee or as an entrepreneur, is insured through the earnings-related pension acts. The individual pension is accumulated according to the following rules:

Pensions accrue from all earnings between the age of 18 to 52 at the rate of 1.5 percent of wages per year, from 53 to 62 at 1.9 percent and from 63 to 68 at 1.5 (if a person draws an old-age pension while still working) or 4.5 percent per year without any cap. For a full-career worker working from age 20 until retirement at age 65, the total lifetime accrual will be 77.5 percent of pensionable earnings. Pension benefits are reduced or increased permanently in the case the pension is taken out at the age of 62 or deferred beyond the age of 68. The abatement for early retirement is 0.6 percent for each month that the pension is taken early while deferral increases it by 0.4 percent.

Recent reforms of the pension system

The Finnish pension system has undergone several reforms in the past years: The 1996 reform legislated that the calculation base for the pensionable wage was gradually increased to the 10 last years of each employment contract. Indexation for pensions in payment was changed to a mixed index in which consumer prices have a weighting of 80 percent and wages have a weighting of 20 percent.

²⁰ The value of this index is calculated by dividing by 1.16 the cost-of-living index which is calculated from the consumer price index.

²¹ Contrary to Norway, assets in pension funds cannot be used for any other purpose than the payment of pensions.

The 2005 reform carried forward what began in 1996. In the pre-reform system there was a discrepancy between payment of contributions and benefit accrual. Employers and employees had to pay contributions into the scheme from age 14 on, but benefit accrual only started at the age of 23. After the reform both the requirement to pay contributions and the accrual of benefits start at the age of 18. The three different accrual rates were introduced.²² Furthermore, the calculation base for pensionable earnings was enlarged to lifetime earnings. Before the reform, entitlements were indexed 50 percent to wages and 50 percent to prices; the reform increased the weighting of wages to 80 percent whereas the one for prices was decreased to 20 percent. Benefits for retirees aged less than 65 years were indexed 50 percent to wages and 50 percent to prices, after the age of 65 indexation changed to 20 percent of wages and 80 percent of prices. In the new scheme, the 20/80 mix applies to all beneficiaries, regardless of age. The general retirement age of 65 years was replaced by a retirement window between 63 and 68 years. Finally, conditions for part-time and unemployment pensions were tightened. These changes took effect from the beginning of 2005, which means that pension entitlements earned prior to January 1st 2005 are calculated as if the employment relationship ended at this date and the pension accrual is vested, from that date on pensions accrue according to the reformed legislation.

From 2010 on there is a life expectancy coefficient at work which reduces the amount of the monthly pension, but not the total amount of an old-age pension providing that the pensioner reaches the age of the increased life expectancy. The life expectancy coefficient is determined for every cohort at the age of 62 and is not changed thereafter. It is defined so that the capital value of the pension adjusted with the coefficient is the same as the unadjusted capital value of the pension in the base year 2009. The life-expectancy coefficient affects those born in 1948 or later.

In 2014 earnings-related pension contribution for employees under the age of 53 will be 5.55 percent of wages. Contributions for employees aged 53 or above will be 7.05 percent of wages.

²² See above.

3.2.2 Germany

Germany's population amounted to 81.8 million persons as at January 1st, 2010. Thus, it represents the largest country of the European Union in terms of population. Since 2002, Germany's currency is the Euro. GDP in 2010 came up to an amount of 2,495 bn. EUR which corresponds to a per capita GDP of 30,500 EUR.

General characteristics of the pension system

In the German old age pension system there is a structural separation between privately employed people, farmers, self-employed persons and civil servants. Only the pensions of privately employed people, civil servants and farmers are financed by state systems, self-employed persons are in schemes which are not (directly) publicly controlled.²³ While there is a point system based on contributions for private employees and farmers, civil servants do not pay contributions; their post-retirement payments are seen as a compensation for their life-time duty to serve the country and they are in a way part of their salary.

For private sector employees there is a mandatory PAYG scheme to which they have to contribute a certain rate (in 2010 18.9 percent) of their income. Payments are made by the employer and the employee to equal parts. In 2001, a voluntary fully funded system with tax credits– the so-called “Riester-Rente” – was introduced to which workers can contribute up to four percent of their income. At the same time an upper bound was set to contributions for the first pillar (20 percent until 2020, 22 percent until 2030).

By contributing to the mandatory scheme people earn pension points with one point corresponding to one year of average earnings. Earnings above an annually adjusted threshold are not taken into account. The benefits are then calculated as the product of accumulated points and the point values (different in East and West Germany) after retirement. The pension point value is annually adjusted by the growth of gross wages net of pension contributions and notional contributions to the “Riester-Rente”. Furthermore, a sustainability factor was introduced which anchors the point value to the ratio of contributors to retirees.

²³ In fact, the *old age insurance for farmers* (AdL) is regarded as part of the German social security pension scheme in this report.

The regular retirement age is incremented between 2012 and 2031 to 67 with a possibility for early retirement after the age of 60 which was raised to 63 from 2006. There is a penalty of 0.3 percentage points per month of early retirement and a bonus of 0.5 percentage points per month of late retirement.

Recent reforms of the pension system

In 1992, benefit indexation was moved from gross wage indexation to net wage indexation. Furthermore, deductions for early retirement were only legislated in 1992.

In 2001, net wage indexation was in part taken back to anchor benefits to the development of gross wages net of pension contributions. A severe system change was achieved in that reform by the introduction of the financially funded “Riester-Rente”, its preferred tax position and the fact that contribution rates were given an upper bound.

Three years later in 2004 the sustainability factor was introduced which connected pension point values to the development of the ratio of contributors to retirees. A gradual increment in retirement age was postponed and finally legislated in 2007. Regular retirement age will be raised from 65 to 67 years between 2012 and 2031. Furthermore, a catch-up factor was introduced to the pension formula in 2007 which takes into account non-implemented deductions from the past between 2011 and 2013.

Recently, the new German government has proposed to make possible retiring at the age of 63 for certain cohorts without any reductions in benefits for those having worked for 45 years. At the moment, the bill is still under discussion in parliament.

3.2.3 Austria

Austria is not only in terms of its geographic location in the “middle” of the EU but also in terms of its population size which amounts to 8.38 million inhabitants. In 1995 it joined the newly established EU. A further EU-integration step was taken with the introduction of the Euro in 2002. Austrian GDP in 2010 amounted to 285.17 bn. EUR which corresponds to a per capita GDP of 34,100 EUR.

General characteristics of the pension system

As most Bismarckian Systems, the Austrian pension system is strongly dominated by the first pillar which is mandatory and based on a PAYG system. The second pillar (occupational pensions) and the third pillar (private pension plans) play a minor but increasing role for Austrian old age provision. Since the first pillar will be subject to our calculations, it shall be described in more detail. Up to 2005, the public PAYG scheme consisted of numerous different schemes for distinct occupational groups – reflecting the historical development of the Austrian pension system. With the harmonization law of 2004 a uniform pension system for all employed under 50 years has been introduced. This new pension system will gradually replace the many different pension schemes for self-employed, civil servants, farmers and for private sector workers.

While past contributions are indexed by wage growth, pension benefits are annually adjusted according to consumer price index.

Recent reforms of the pension system

Triggered by present budgetary pressure and by future demographic challenges Austria passed substantial pension reforms in the last years. With the reform of 2000 early retirement ages were increased in the general schemes from 55 (60) to 56.5 (61.5) years for women (men). Furthermore disability early retirement was abolished.

Key parameters of the Austrian pension system have been considerably changed with the reform of 2003. One of its main elements was the gradual increase (from 2024 until 2033) of the statutory retirement age for women to the present value of men: 65 years of age. Moreover, the base of average earnings for the pension calculation is gradually extended from 15 to 40 years (until 2028) with the reform of 2003. Furthermore the accrual rate was lowered from 2 to 1.78 until 2009. As a result the maximum replacement rate of 80 percent will be reached after an insurance history of 45 instead of 40 years. However, alongside a cap on pension losses was adopted.²⁴ Finally, the reform of 2003 consisted of measures to further reduce early retirement in Austria including the abolishment of early retirement on

²⁴ According to this legislation, a pension granted as of 2004 may only be ten percent lower than a comparable pension granted at the end of 2003.

account of unemployment, raising further minimum age for long-term insured men (women) to 65 (60) until 2017 as well as increasing pension deductions for earlier retirement.

Cornerstones of the major reform of 2004, effective since 2005, were the introduction of a uniform pension system for all employed under 50 years and the introduction of a new system of individual transparent pension accounts with the guiding formula of 45/65/80 (i.e. the first pillar guarantees a pension benefit of 80 percent of the assessment base after 45 years of insurance and at the statutory retirement age of 65 years). Alongside the cap on pension losses was reduced to five percent and will only gradually be increased to ten percent until 2024. Moreover, within the framework of the 2004 reform a sustainability factor has been introduced into the Austrian pension system. However, this factor has only little in common with its German counterpart. It only has an impact on future pension benefits if life expectancy deviates from the medium forecast of Statistics Austria.²⁵ The reform of 2004 also changed the crediting of non-contributory periods such as child-care times or military service. Furthermore the possibility of early pension has been introduced through the establishment of a pension corridor. Retiring between 62 and 68 is either rewarded by pension credits in case of postponed retirement or discouraged by pension discounts when retiring early. Credits as well as discounts amount to 4.2 percent of the assessment base per year.²⁶ However, individuals who pursue a profession regarded as extraordinarily straining are allowed to retire earliest at the age of 60 with a discount ratio of 2.1 percent. Moreover, the reform of 2004 on the one hand replaced the inflation oriented revaluation of pension entitlements by a method based on the average increase of the respective contribution basis. On the other hand pensions are indexed (from 2006 on) according to CPI.

The introduction of pension accounts divided people entering retirement into three groups: Those to whom the old rules apply only (no pension accounts), those who are entirely subject to pension calculation via the new pension accounts and finally a group to which so-

²⁵ In our calculations we are not expecting such a deviation. Thus, the Austrian sustainability factor – in contrast to the German one - has no impact on our results.

²⁶ However, this rule only applies if at least 450 insurance months have been acquired. Furthermore, discounts (credits) cannot exceed 15 (12.6) percent of pension benefits. Losses from actuarial deductions are excluded from the loss cap of ten percent.

called parallel accounting applies.²⁷ This in turn resulted in a very complicated process of calculating pension benefits with very long transitional periods. Therefore, from 2014 on the so called basic credit entry replaces parallel accounting. The idea is to summarize all accrued entitlements and enter the sum into the pension accounts. The process of calculating this sum is still very complicated but the transitional period has been reduced dramatically. From 2017 on pension entitlements will be calculated applying the rules of pension accounts only.

3.2.4 Spain

Spain is the second largest country of the European Union in geographical terms. It has a population of 46.49 million inhabitants as at January 1st, 2010. The Spanish economy has been growing steadily since the transition towards democracy started in 1975. The accession to the European Community in 1986 furthered the Spanish economic expansion accompanied by a falling unemployment rate and a reduced inflation rate. It is one of the twelve countries which introduced the Euro currency on January 1st, 2002. However, Spain was severely hit by the financial crisis which led to government debt increasing from 36.3 percent in 2007 to 86 percent in 2012. One of the main issues Spain is dealing with at the moment is the extraordinary high unemployment rates of young people (i.e. younger than 25 years) which amount to 55.7 percent in 2013. Spanish GDP was 1048.9 bn. EUR in 2010, the corresponding per capita GDP amounted to 22,700 EUR.

General characteristics of the pension system

The Spanish public pension system consists of two schemes: on the one hand a non-contributory basic scheme provides assistance for the low-income earners; on the other hand a labor-market contributory system provides social security for the rest. This system is fragmented into special schemes for mining, fishing, domestic work, self-employment and for the public service.²⁸ The main subsystem is the general scheme which covers most employees.

The basic scheme grants means-tested assistance for individuals who earn less than a certain threshold. No previous contributions are required in order to obtain benefits. The labor

²⁷ This means that pensions are calculated both according to old and new rules and then a weighting method is applied according to the contributions paid before and after 2005.

²⁸ Currently, efforts to unify the different systems are under way.

market-based social security is financed by contributions from employers and employees. Contributions are excluded from the income tax base while pension benefits are taxed as labor income. The public pension system is administered and managed by the Seguridad Social as a defined benefit PAYG system.

Eligibility for benefits requires an entry age of 65 years and at least 15 years of contribution. The pension benefit is related to the number of contribution years and the contributions paid. The earnings base is pay over the last 15 years. Benefits start at 50 percent of the earnings base if an individual retires at 65 with the minimum required years of contributions. Each additional year until 25 increases the benefits by three percent and afterwards each additional contribution year until 35 by two percent. It is possible to start collecting the pension from the age of 60, but this leads to a 35 percent penalty on the regulatory base. If claiming the pension is deferred, the rate which is applied to the regulatory base is increased by two percentage points for each additional year.²⁹

Recent reforms of the pension system

In 2011 a law on reforming the public pension system was passed. It contains a rise in the retirement age from 65 to 67³⁰, the extension of the pension calculation period from 15 to 25 years³¹ and an increase in the number of contribution years necessary to be entitled to the full pension from 35 to 37 years. Additionally, a sustainability factor was introduced which requires that the pension system is evaluated every five years starting in 2019 and which triggers whatever parametric adjustments are necessary to ensure the sustainability of the system.³² Implementation of the remaining reform measures will start in 2013. The retirement age will rise at a rate of one month per year between 2013 and 2018 and two months per year until 2027. The contribution period necessary to claim a full pension will be increased in six-month steps in 2013, 2020, 2023 and 2027. Pension benefits were indexed to the consumer price index anticipated for the year in question. But from 2014 on, the rise

²⁹ The increase is three percentage points for each additional year after 40 years of contributions at the age of 65.

³⁰ However, it will still be possible to retire at the age of 65 after a contribution career of at least 38.5 years and for workers with especially risky or arduous jobs.

³¹ From 2013 on the calculation period will rise in one year steps each year beginning with 16 years in 2013, reaching 25 years in 2022.

³² The sustainability factor is based on the evolution of life expectancy of old-age pensioners in the social security system at the age of 67.

will be lower at a minimum of 0.25 percent per year only; the maximum increase possible is set at the inflation rate plus 0.5 percent.³³

3.2.5 France

The population of the French Republic amounted to 64.66 million in habitants at the beginning of 2010. France uses the Euro as national currency. GDP amounted to 1936.72 bn. Euro in 2010 which is equal to a per capita GDP of 29,900 Euro.

General characteristics of the pension system

The French pension system is strictly separated between publicly and privately employed workers. While public employees are in a one-pillar defined benefit scheme³⁴, privately employed workers are in a scheme which mixes a basic defined benefit and a mandatory complementary point-value system. There are several slightly different basic schemes for privately employed and self-employed workers, which renders a pension system challenging to analyze from an academic point of view.

The basic pension is a defined benefit scheme that seeks to reach a replacement rate of 50 percent of average earnings of the 25 years of highest earnings.³⁵ A person is eligible to full pension if he/she either is 60 years old and has an insurance period of 40.5 years or if he/she is 65 years old. Thus, the pension benefit is calculated as the reference wage times the pension rate (which is 50 percent for those fulfilling the eligibility conditions) times the individual insurance period in relation to 40.5 years³⁶. There is an additional penalty if claiming the pension before fulfilling eligibility conditions of five percent per missing year. If retirement is postponed, there are bonuses at the same amount.³⁷ Pension benefits are price indexed.

³³ Annual rises are calculated with the help of a complex formula which takes into account revenues and expenditures of the pension system, the number of pensions paid and the variation in average pensions.

³⁴ Please note that in the following we will focus on the private sector only, as we do throughout this report.

³⁵ For persons born in 1933 or earlier, it was ten years only. For cohorts born after 1933 and earlier than 1947 the period of earnings that is taken into account increased in one-year steps. Past earnings are indexed to inflation. Before the 1993 pension reform, wage indexation was applied. Thus, enlarging the calculation basis and changing indexation rules led to a decisive reduction in pension levels.

³⁶ This ratio can reach a maximum of 1 only.

³⁷ This has only been legislated in the 2003 pension reform. Before, the penalty for early retirement was 10 percent for each year missing. Bonuses for deferment did not exist.

The mandatory complementary scheme is a defined contribution point scheme. Employers pay 60 percent of the contributions, employees pay 40 percent. Only 80 percent of actual contributions are transferred into points. The number of points is annual contribution over reference salary; the pension claim equals the number of points times the point value. The reference salary is indexed to wage growth whereas the point value is indexed to the CPI. There is a reduction of one percentage point per quarter when pension is claimed before age 65.

Recent reforms of the pension system

In the 2003 pension reform the duration condition necessary to receive a full pension was raised to 41 years until 2012. Thereafter, it is indexed to future life expectancy gains, splitting these between 2/3 of additional length of working life and 1/3 of increase in retirement length.

In the course of the financial crisis, a second pension reform took place in 2010. This reform legislated that minimum retirement age will rise from 60 years to 62 years in 2018. Furthermore, the age from which on full retirement is granted without fulfilling contribution conditions is raised to 67 years in 2023. Thus, the age bracket for retirement shifts from 60/65 to 62/67.

3.2.6 United Kingdom

The United Kingdom is a unitary state consisting of four countries: England, Northern Ireland, Scotland and Wales. The national currency is the Pound Sterling (GBP), with an exchange rate of 0.86075 GBP to the Euro at the end of 2010. In 2006, GDP added up to 1,485.62 bn. GBP, equal to a value of 1,731.81 bn. EUR. This corresponded to a per capita GDP of 23,900 GBP or approximately 27,800 EUR. The United Kingdom had a population of 62.51 million inhabitants as at January 1st, 2010. Thus, it is the most densely populated country in our sample.

General characteristics of the pension system

The United Kingdom features a rather complex pension system with elements of public and private provision. The public scheme consists of a means-tested tax-financed pension credit,

a flat-rate basic pension and an earnings-related additional pension. It is possible to “contract out” of the earnings-related pension into private pensions of different types.

In 2003, the pension credit was introduced. It provides a means-tested minimum income if other sources of income do not reach a certain level. Annual percentage increase is legislated to be at least equal to the increase in national average earnings.

To qualify for the full basic state pension, one needs to pay social security contributions³⁸ or have credits³⁹ for 30 years⁴⁰. A proportion of the full basic pension is paid for every contributing year.⁴¹ Benefits are flat-rate and indexed annually by the higher of the increase in earnings, the consumer price index or 2.5 percent.⁴² It is also possible to defer claiming the basic pension, which causes an increase in the level of pension payments of 10.4 percent for each year of deferral.

The benefit value for the earnings-related pension is calculated applying the average lifetime salary; earlier salaries are uprated in line with general average earnings. Pensions in payment increase in line with the consumer price index.

Recent reforms of the pension system

The UK pension system underwent various modifications in the last years and the reform process is still under way.

Until 2010 state pension age was 60 for women. Under the Pension Act 2011 the augmentation of pension age for women originally legislated to reach 65 years in 2020 was brought forward to 2018. By 2020 pension age will have been raised to 66 for both men and

³⁸ As it is the case in Norway, social security contributions do not only cover pension insurance but also health services, sickness, disability and incapacity benefits and job seeker’s allowances.

³⁹ There are several activities which result in credits without actually paying contributions, e.g. unemployment, sickness, periods of raising a child or caring for a relative.

⁴⁰ Men who reached state pension age before 2010 were eligible to the full amount after 44 years, for women it was 39 years.

⁴¹ Before 2010 for men (women) a contribution history of at least 11(10) years was required to receive any benefit at all.

⁴² This has only been legislated in 2011, maybe due to remarkable erosion of pension benefits compared to average earnings in past years.

women⁴³, it will increase further to 67 between 2034 and 2036 and finally to 68 between 2044 and 2046.

Within the earnings-related pension there were three different earnings bands with individual accrual rates until 2010. In 2010 the second and the third band were merged and from 2012 on accrual in the first band is flat rate, indexed to national average earnings. In May 2014 a pensions bill became law which terminates earnings-related pensions and creates a pension system consisting of one pillar only. From 2016 on pension will be flat rate with the full level being based on a contributory period of 35 years.

3.3 Minor changes in the pension system

3.3.1 Denmark

At January 1st 2010 5.53 million people lived in Denmark. The national currency is the Danish Crown (DKK) whose exchange rate to the Euro was 7.45 at the end of 2010. Thus GDP of 1,760.05 bn. DKK equaled 236.33 bn. Euros. In 2010 GDP per capita amounted to 317,400 DKK or 42,600 EUR.

General characteristics of the pension system

In Denmark every citizen aged 65 or above having lived in the country for at least three years has the right to get a tax financed basic pension.⁴⁴ The full amount is paid after a residence period of 40 years, missing years lead to proportional reductions. Besides the basic pension, which is independent of income, there is an income-tested supplementary amount which counts for about 50 percent of the total minimum pension offered to single pensioners. Pension payments are indexed annually to wage growth. To account for increasing life expectancy, eligibility age is increased stepwise in coming years and tied to developments in life expectancy thereafter.

Public earnings-related pension systems do not exist in Denmark. The only type of mandatory pension insurance is a supplementary system for employees (ATP scheme).⁴⁵ This

⁴³ For men, pension age is currently 65.

⁴⁴ Foreigners are eligible to basic pension payments after a residence period of ten years, of which at least five years must have been spent in Denmark directly prior to retirement.

⁴⁵ The ATP scheme is compulsory for all Danish employees working a minimum of nine hours per week.

system is fully-funded and financed through contributions by employers and employees. The pension fund is collectively administered under the surveillance of the tariff parties. The amount of contributions is fixed, dependent on monthly working hours. Benefits are paid in form of lifetime pensions from the age of 65;⁴⁶ they take into account expected life expectancy. Retirement age is raised in the same way as in the public system.⁴⁷ An early retirement scheme that originally offered opportunities for voluntary retirement from the age of 60 has been gradually curtailed in a succession of reforms beginning in the 1990s.

Furthermore, occupational pensions tied to collective wage agreements that cover about 80 percent of the entire workforce and private pension savings plans play a large role in providing retirement income.

Recent reforms of the pension system

In December 2011 there was a retirement reform which speeded-up by five years the implementation of an already enacted gradual increase of the eligibility age for national old age pension: the increase from 65 to 67 years will take place in the period from 2019 until 2022 instead of 2024 until 2027.

4 Measuring sustainability

4.1 The methodology of Generational Accounting

The method of Generational Accounting was originally developed by Alan Auerbach, Jagadeesh Gokhale and Laurence Kotlikoff at the beginning of the 1990s to project the long-term development of public finances.⁴⁸ In the following the method will be applied to one part of public finances only, namely to pension systems. The intertemporal budget constraint marks the starting point of Generational Accounting. It states that in a long-term perspective net payments (i.e. transfers net of contributions) made by living generations

⁴⁶ As the ATP scheme is of the defined contribution type, the amount of pension benefits depends on the length of the contribution period and of the hours worked. Self-evidently the second component influencing benefits is returns on investment.

⁴⁷ Please note that because the ATP system is a fully funded defined-benefit system, it will not be part of our calculations in the following parts of this report.

⁴⁸ See Auerbach et al. (1991, 1992 and 1994). For a detailed more formal description see Hagist et al. (2011).

have to be financed by existing pension funds⁴⁹ plus net payments made by future generations. For living and future generations, division of the aggregate remaining lifetime net payments by the number of cohort members alive in a specific year defines the cohort's Generational Account in that year. Generational Accounts are constructed in a purely forward-looking manner, only the contributions paid and the transfers received in or after the base-year are considered. In consequence, they cannot be compared across living generations because they incorporate effects of differential lifetime. However, Generational Accounts of base-year and future born agents can be compared as both are observed over their entire lifecycle.

Intertemporal public liabilities arise when the intertemporal budget constraint of pension systems is violated. The amount of intertemporal public liabilities measures aggregate unfunded claims on future budgets, assuming that present policy will hold for the future. The sustainability gap is now derived by setting intertemporal public liabilities in relation to base-year's GDP.

Using the method of Generational Accounting can help to make the effects of pension reforms visible. This is done by calculating Generational Accounts before and after a reform and then comparing them for every single cohort. For a comparison between cohorts, differences of Generational Accounts are calculated as annuities per cohorts. Thus, it can be shown which cohort bears the largest burdens of a particular pension reform.

4.2 General assumptions and data description

Expected life expectancy determines the payment duration of pension annuities. Therefore, it is a main input factor for the assessment of both adequacy and fiscal sustainability. Our assumptions on the future development of life expectancy are based on the recent demographic projection of Eurostat, EUROPOP2010.⁵⁰ This guarantees a harmonized set of assumptions for cross-country comparison. Data on future fertility rates and migration development are also taken from EUROPOP2010.

⁴⁹ Pension funds may have large influences. This is the case especially in Norway with the Government Pension Fund.

⁵⁰ For more details see Eurostat (2011).

Expected wage growth considerably determines the level of future pension benefits as most schemes incorporate this figure either in the adjustment of accrued pension rights or in indexation of pension benefits or in both. In recent years wage growth was relatively heterogeneous across EU countries with mainly Central Eastern European countries experiencing relatively high increases of average earnings. We will reflect these heterogeneous wage growth paths in our calculations and apply the productivity assumptions of the Ageing Working Group⁵¹ (AWG).⁵²

When it comes to choosing the interest rate we also follow the AWG and apply a three percent interest rate in real terms which reflects more or less the average bond yields in past decades.

While the AWG focuses on future pension expenditure, we extend this perspective by incorporating the revenue side in our calculations as well. Therefore, we use age and gender specific contribution profiles which are weighted with our demographic projections and adapted to economic forecasts. Furthermore, we take into account that in some countries specific pension contributions do not exist and that often a proportion of pension expenditures is financed via tax revenues of the general government. Usually selected non-contributory periods, such as child care or unemployment periods, are credited in the benefit formula and funded by tax inflows into the pension scheme budget. Therefore, we additionally estimate future tax payments – assuming that these expenses are covered through revenues from value added tax, as the value added tax is one which is levied in every country and which has a very broad tax base.

In section 3 above, pension reforms enacted until spring 2014 were taken into account. In contrast, the following calculations will only entail reforms which had already become law by September 2011 except for the case of Poland where it was possible to model the pension reform of 2013 as well.

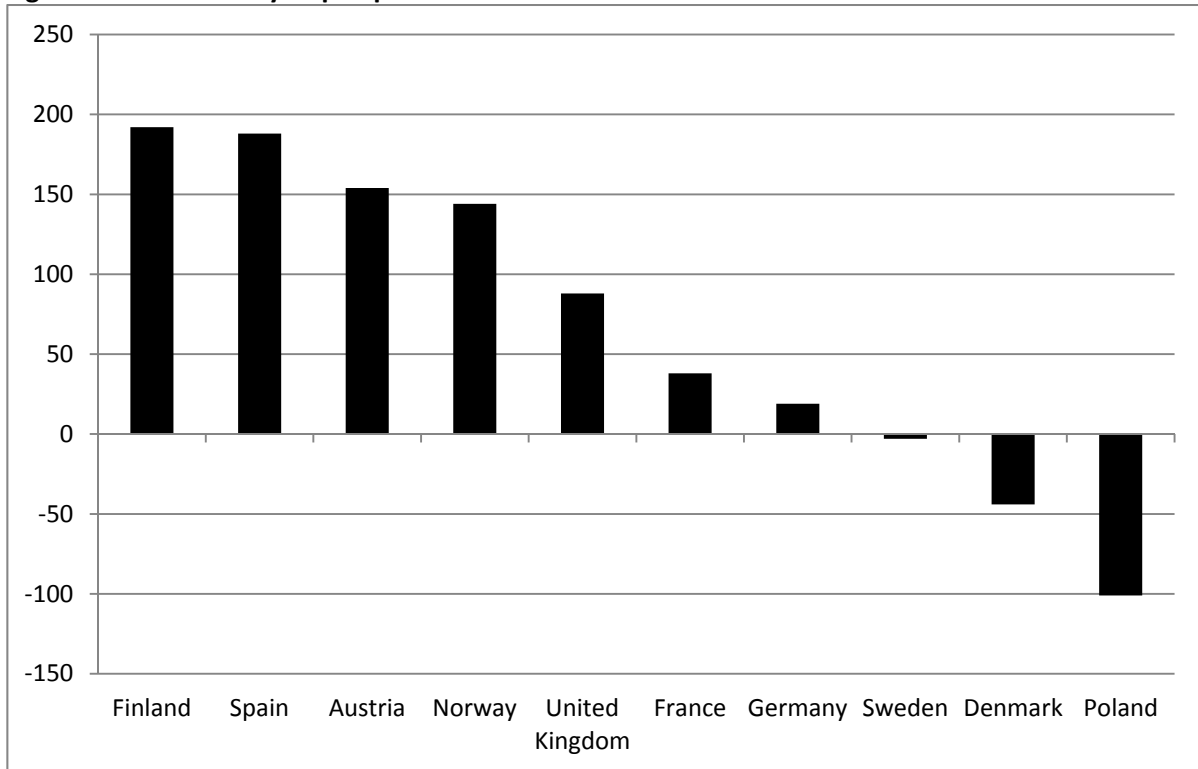
⁵¹ The Ageing Working Group has been commissioned by the Economic Policy Committee of the European Union to improve quantitative assessment of the long-term sustainability of public finances. In this regard the AWG published the Ageing Report in 2009 and in 2012.

⁵² For the country-specific assumptions see Directorate-General for Economic and Financial Affairs and Ageing Working Group (2012). In cases in which it is not possible to use AWG Assumptions, a rate of 1.5 percent is applied.

4.3 A first overview of sustainability in European pension systems

Can a pension system as it works today be pursued in the future or not? To get a first idea of the answer to this question, for each country the concept of Sustainability Gaps is applied as described in section 4.1. Figure 2 shows the Sustainability Gaps for our country sample.

Figure 2: Sustainability Gap in percent of GDP 2010



Source: Own calculations

There are three pension systems which can clearly be characterized as being sustainable according to this indicator. The Polish system has more than closed the Sustainability Gap. Taking into account all recent reforms, Poland will even generate surpluses in the future.⁵³ In Denmark, the situation is almost similar and Sweden arrives at point zero.⁵⁴ In the German case, it is taken into account that imbalances can be offset by a rise in the contribution rate.⁵⁵ Ignoring this, the Sustainability Gap would amount to 90 percent of GDP instead of

⁵³ This is due to the fact that at the moment, Poland is in a transition period from a pay-as-you-go system to a partially funded one. The transition is financed by tax inflows which are projected into the future.

⁵⁴ Comparing pension systems of different countries one should bear in mind that the size of the system plays a role as well. In Denmark and the United Kingdom for example, public pension systems are smaller than in the other countries of the sample. For more details on the size of pension systems see section 5.2.3.

⁵⁵ In the German case, a possible increase in the contribution rate is taken into account, because it is restricted by law that the contribution rate is allowed to grow at most up to 22 percent by 2030. Taking into account this increase can be viewed as a clearly defined benchmark scenario. In other countries, for example in Norway, such rules do not exist. Including general tax increases would be arbitrary as regards the amount of the

18.7 percent. France also performs quite well due to the assumption that the ambitious reform of augmenting retirement age to 67 years by the 2020s will actually be realized.⁵⁶ The Norwegian Sustainability Gap amounts to 144 percent of GDP.⁵⁷ From this perspective, Norwegian pension policy is clearly not sustainable. Finland is the country with the highest Sustainability Gap, amounting to 192 percent of GDP.⁵⁸

Yet, applying the concept of Sustainability Gaps one has to bear in mind that cross-country comparison is impaired for example due to different demographic developments in each country. Demographic developments determine future economic power and thus the ability to pay debts. For countries with rising populations (for example Norway) the economic power differs from countries where populations shrink (for example Germany). Thus, a more detailed analysis and cross-country comparison is necessary.

4.4 Sustainability gains of pension reforms in comparison

4.4.1 The overall impact

Besides the fact that the concept of Sustainability Gaps is easy to understand, it can show the overall effect of pension reforms by comparing the Sustainability Gap before and after a reform. This is done in figure 3 for Norway, Germany and Poland.

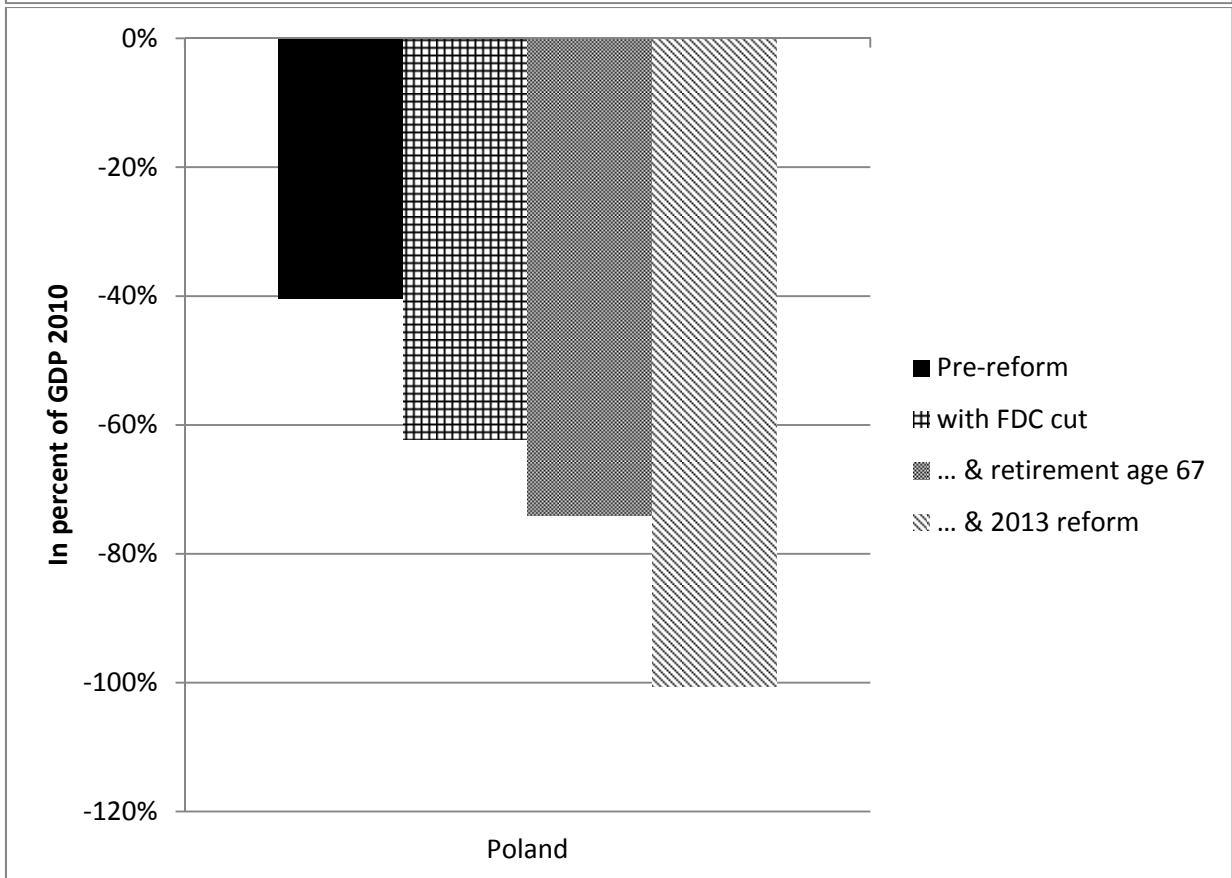
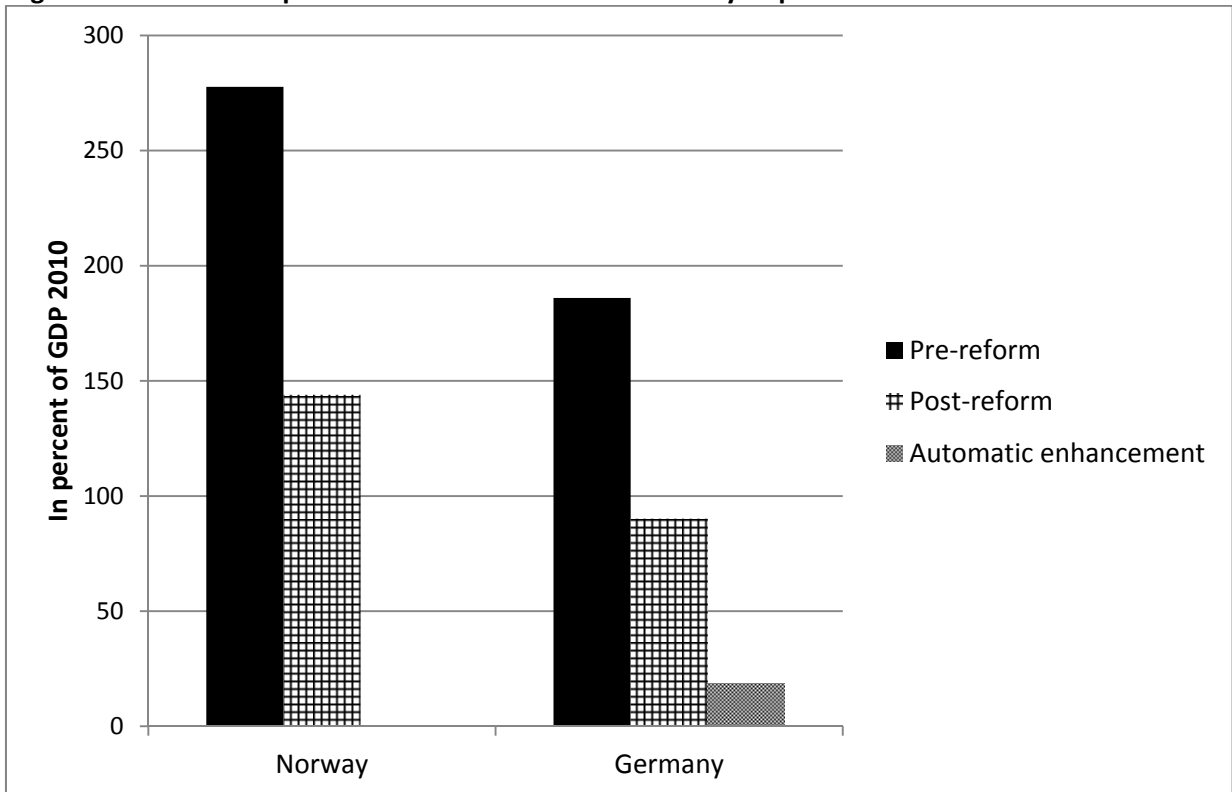
increase. Therefore, we do not take account of tax increases in situations in which they are not clearly defined in advance.

⁵⁶ Furthermore, for the calculation the budget has been closed with tax inflows. Actually, the pension system annually runs deficits.

⁵⁷ The Sustainability Gap in Norway is the result of the implicit pension debt post-reform and the assets from the Norwegian Government Pension Funds (measured as share of general not main-land GDP). In 2010, these assets were worth 103.8 percent of GDP. In our calculations we do not take into account the value of the oil and gas reserves. In theory, one could also add the present value of oil and gas reserves which would significantly decrease the Sustainability Gap. From this regard, Norwegian pension policy could probably even be labelled sustainable. For a calculation incorporating the present value of oil and gas reserves see Hagist et al. (2013).

⁵⁸ The numbers we calculated for Finland slightly differ from the results of Vaittinen and Vanne (2013) due to several reasons. First of all, we apply a discount rate of 3 percent, while they discount at 3.5 percent. Our results cover both national and earnings-related pensions while in their report the Sustainability Gap is shown for earnings-related schemes only. Finally, the authors assume that people will adjust retirement behaviour to recent reforms. In contrast, we do not take into account any changes in behaviour.

Figure 3: The effect of pension reforms on the Sustainability Gap



Source: Own calculations

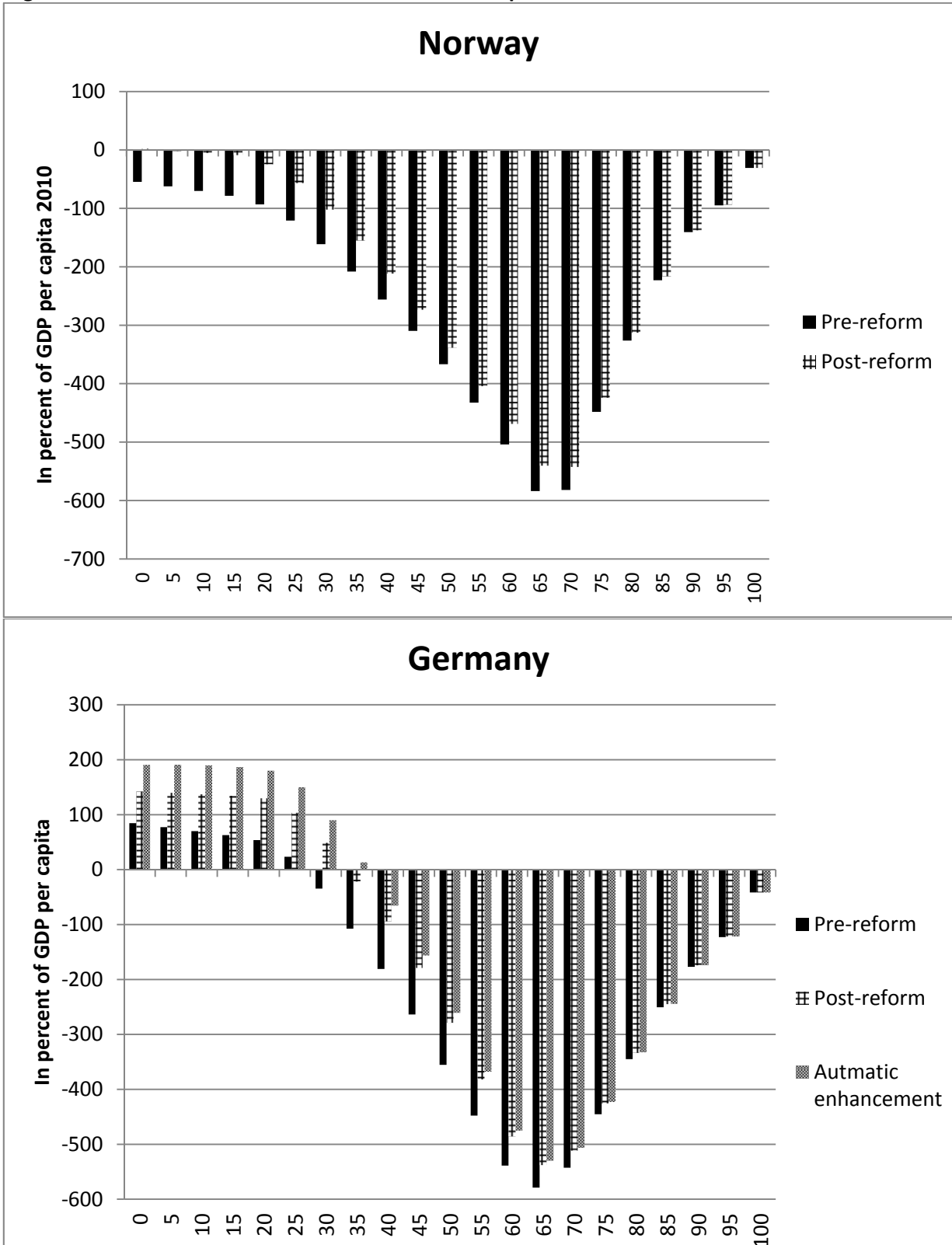
The large impact of the Norwegian pension reform is clearly visible. The Sustainability Gap was almost halved from 277.7 percent of GDP to 144 percent.⁵⁹ Germany started from a lower level of 186 percent of GDP and will arrive at 18.7 percent. Figures for Poland show that each new reform added to future surpluses. In the end, these amount to 100 percent of GDP. As it has already been mentioned in the preceding section, this is due to large tax inflows which are projected into the future. Furthermore, past reforms mainly focused on the short run: People were given the possibility to opt out of the funded part of the pension system. If they do so, accumulated capital is totally transferred to the pay-as-you-go part.

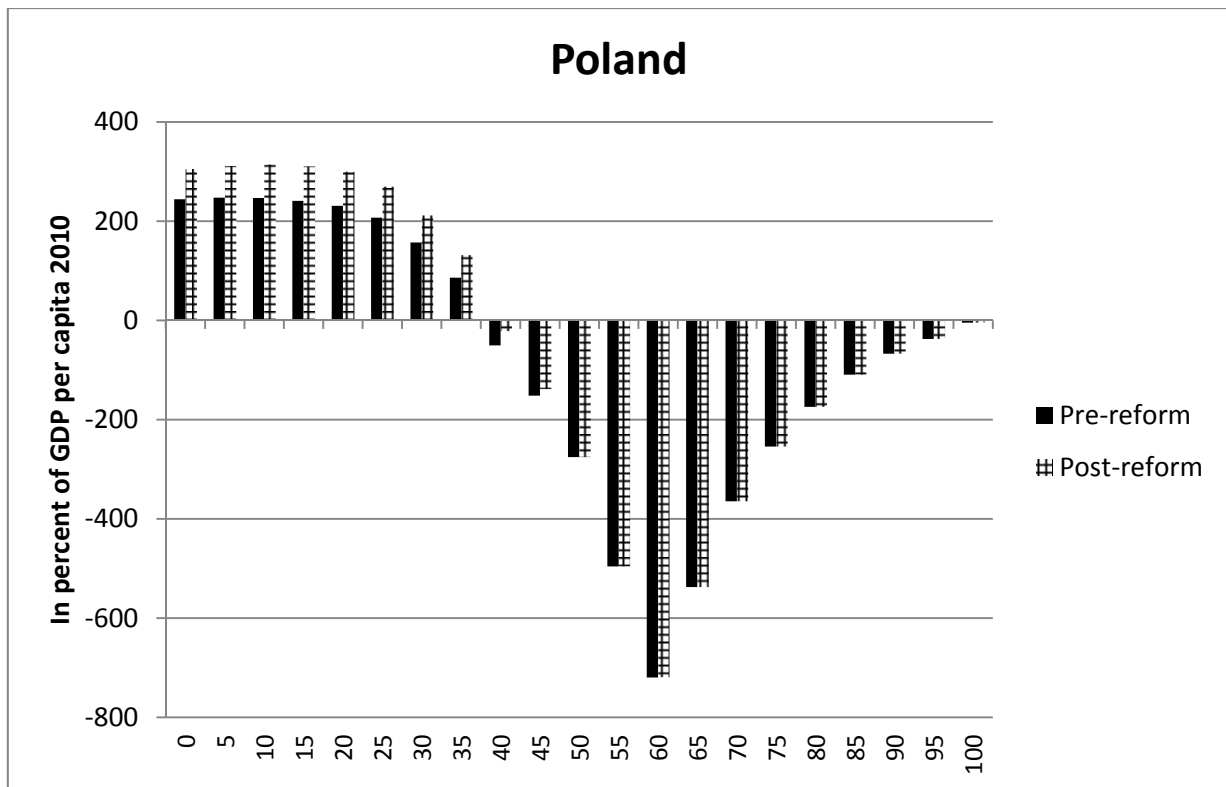
The impact of pension reforms is also visible in Generational Accounts. They set into relation aggregate remaining lifetime net payments to the size of a corresponding cohort. Figure 4 shows Generational Accounts before and after the pension reform for Norway, Germany and Poland. The sinus-shaped pattern, which can be observed in the German and in the Polish case, is very common in countries with strong pay-as-you-go systems. The young until the age of 35 finance older generations. In the Norwegian case, Generational Accounts are only positive for very young cohorts close to the newborns. This means that over their remaining lifecycle almost everyone will receive more pension benefits than he will contribute to finance the system. However, this only holds because we do not take remaining oil and gas reserves into account.

The comparison shows that in Norway and Germany almost every cohort has to contribute to the reduction of the Sustainability Gap. In Poland, younger cohorts have to contribute while older ones do not.

⁵⁹ Please note that the Norwegian Sustainability Gap is measured in percent of GDP, including petroleum activities (in contrast to mainland GDP).

Figure 4: Generational accounts before and after the pension reform





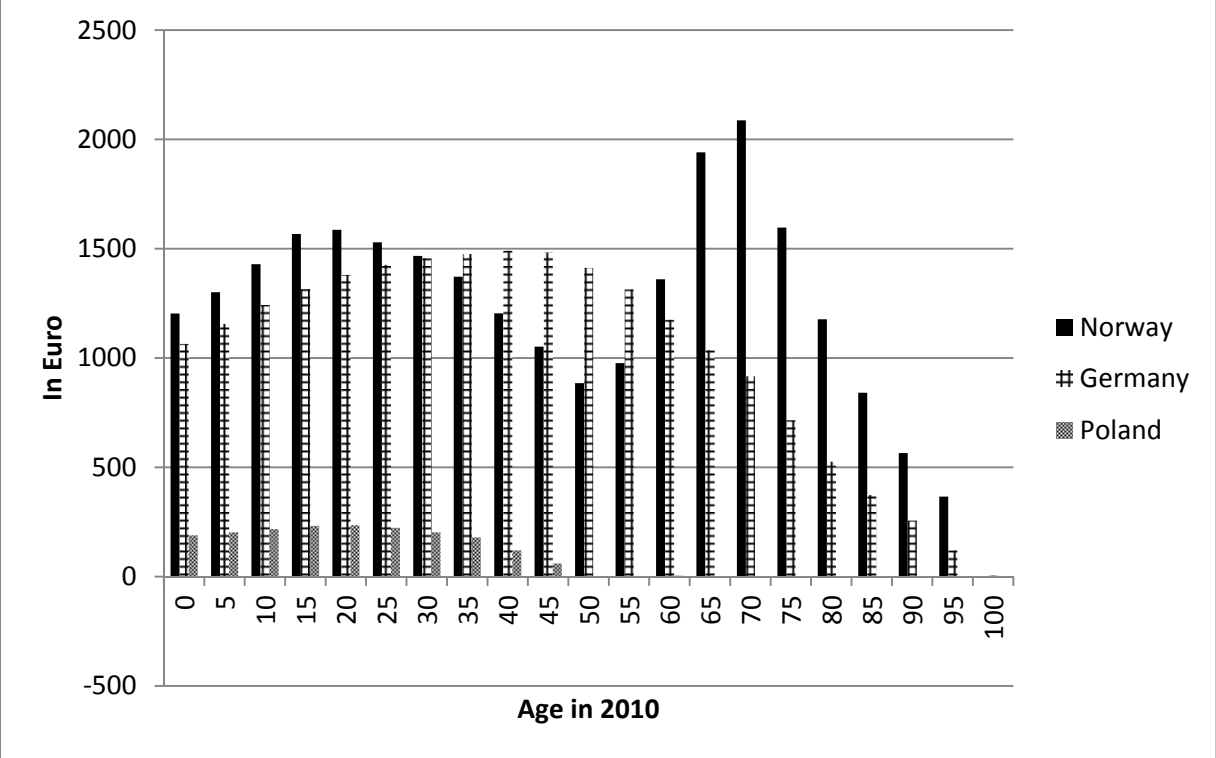
Source: Own calculations

As Generational Accounts are strictly forward looking, they cannot be compared between living generations. To compare Generational Accounts not only from the viewpoint of one cohort but between cohorts another indicator is necessary. It will be introduced in the following section.

4.4.2 Who bears the burden?

Calculating differences of Generational Accounts before and after a reform in annuities per cohort, it is possible to assess who exactly bears the burden of a pension reform. For example, the Norwegian newborn has a close to zero Generational Account in the new system. In the old system, he/she received a significant net transfer from the pension system. In the burden analysis, this will show up as a burden in annuities because the net transfer is leveled by the reform. The results of this burden analysis are shown in figure 5.

Figure 5: Induced burden of pension reforms per cohort in annuities



Source: Own calculations

In the Norwegian case, the burden of cohorts aged 65 and 70 years catches the eye. The burden they bear is quite high and it is the largest one of all cohorts. Here, the impact of a change in indexation rules is clearly visible. Indexing pensions in payment to a rate lower than wage growth leads to benefit losses especially for those who are at the beginning of retirement because they face the longest benefit periods. In contrast, cohorts only some years younger bear the smallest burden. This pattern has different causes. Firstly, the transition period protects generations still working but close to retirement age from the full effect of the longevity adjustment factor. The first fully reformed cohort is the 47 years old. They are better off than their older counterparts as discounting reduces their losses in present value. Younger cohorts than the 47 years olds are also worse off. This is due to the increasing life expectancy of these cohorts. In the old pension system increasing life expectancy was increasing benefits in present value terms. The linking of benefits to life expectancy as in the new system reduces this gain into a loss. We model increasing life expectancy until 2060 which is why there is again a turnaround in the burden around the cohorts between 15 and 20 years olds.

As regards Germany, the burden is distributed more equally across generations. The especially large cohorts (the baby-boomers), in 2010 aged around 50 years, bear a larger

part of the burden than their Norwegian counterparts. On the other hand, in Norway pensioners contribute to bearing the burden to a larger extent than in Germany. German pension reforms mostly affected younger cohorts and protected those already in retirement. In the Polish case figures are much smaller due to the fact that the pension system is actuarially quite fair. Recent reforms have raised contributions but at the same time, accrued pension rights went up as well. Furthermore, the picture above again shows that older generations were not burdened by recent reforms.

5 There is more than sustainability – on the issues of measuring adequacy

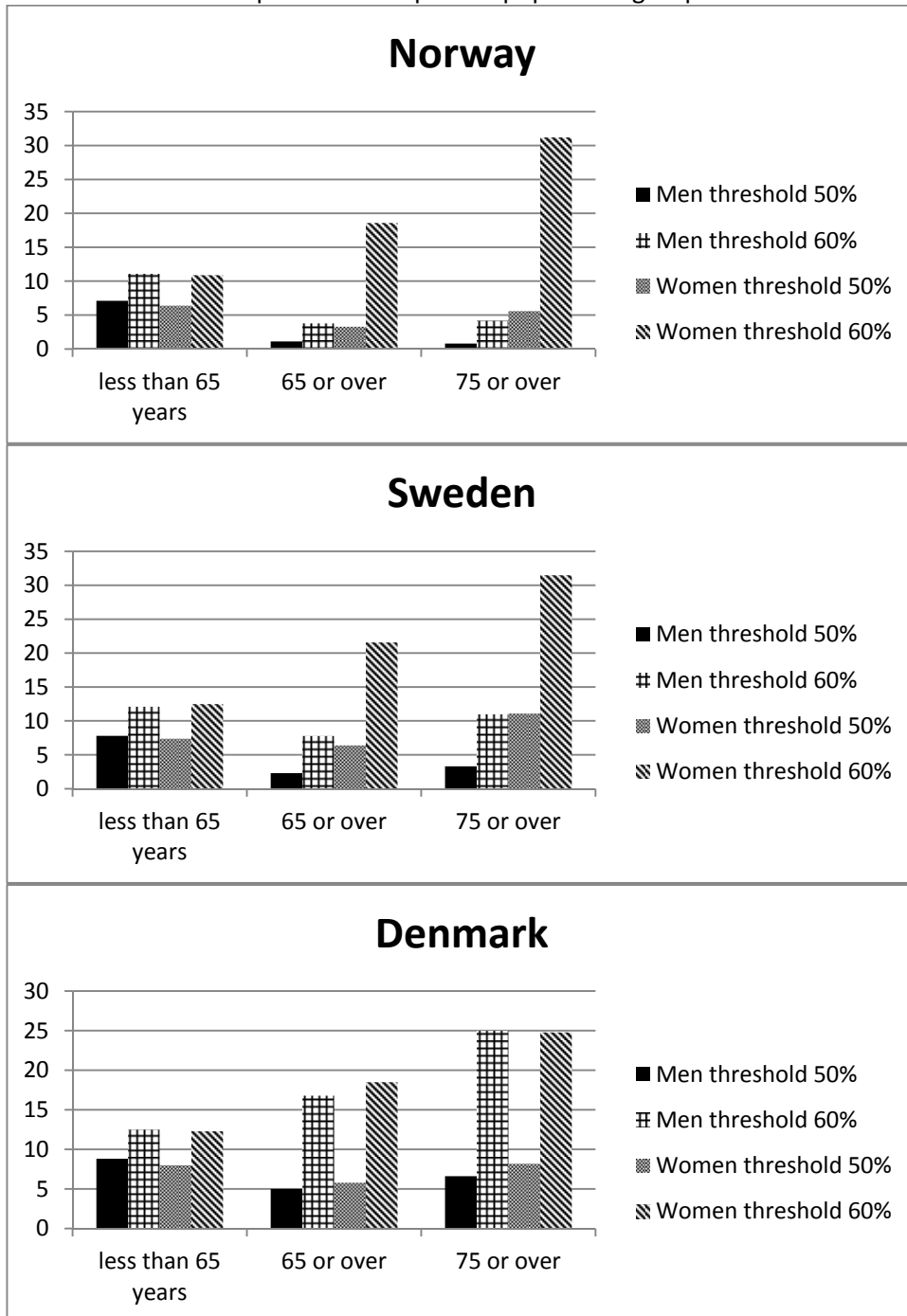
5.1 Starting point: the overall economic situation of elderly persons

Securing adequate incomes for elderly persons is another goal of pension systems besides reaching sustainability. Before we turn to an in-depth analysis of adequacy and its measurement, this subchapter offers some insights into the overall economic situation of elderly persons. Particularly, we want to look at poverty measures applied by Eurostat to get a first impression of the extent to which pension systems in place today are capable to prevent elderly persons from being poor.⁶⁰ The following description is based on the so-called at-risk-of-poverty rate. This measure classifies everybody whose income is below a certain threshold as being exposed to the risk of poverty. The threshold can be set differently. In the following, we will apply two variants, one with a cut-off point at 50 percent of median equalized income and another one with a cut-off point at 60 percent. Figure 6 shows the results for the countries of our sample. Poverty ratios are displayed for three different age groups; the first group includes all persons younger than 65 years, in the second group persons aged 65 years or older are covered and in the third group everyone aged 75 years or above is included. The first group is presented to be able to show differences between those who are retired and those who are not. In Germany, France and Poland, for example, the risk of being poor is higher in the period before retirement. This could be a hint that overall, pension systems are still able to fulfill one of their intricate tasks, namely to preserve elderly people from poverty. In some other countries the same pattern is

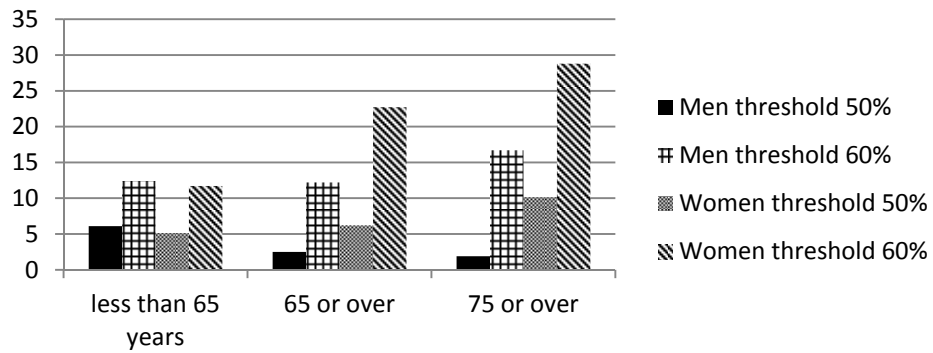
⁶⁰ Please note that these poverty measures include all persons from a certain age, they do not differentiate between those covered by public pension systems and those not covered. Nevertheless, as in most countries public pension systems cover a large majority of people, poverty measures might give a first indication of the effectiveness of public pension systems.

visible for men only, depending on the threshold applied. This is the case in Norway and Finland. For Spanish men, there is not much difference before and after retirement, at least if the threshold of 60 percent is applied. Another aspect which catches the eye is that poverty rates are remarkably high for women in Norway, Sweden and Finland. This motivated a study by Ahohen and Bach-Othman (2010). The authors identified differences in household composition as the main explanation for high poverty risk rates for older women. They found a strong link between gender differences in poverty risk and gender differences in the type of household an elderly person lives in. If the poverty risk of persons living alone is higher than that of persons living in a household with more than one person, this might easily result in gender differences in the poverty risk. Especially among the oldest old it is far more common for women to live alone than it is for men, mainly due to the fact that women live longer. At least for Norway, the picture is clearly different if the threshold marking the poverty risk is lowered. Only 5.6 percent of women aged 75 or older have less than 50 percent of the median equalized income. Thus, it can be said that older old women are more exposed to the risk of being poor, but they only fall little short of the 60 percent threshold. The same pattern can be observed in the other Scandinavian countries, but Norway remains number one when it comes to having the least people with less than 50 percent of median income. In Norway the level of the minimum pension was raised significantly between 2009 and 2011. This resulted in declining poverty rates for women aged 65 and older and for women aged 75 and older – at least when the threshold of 50 percent of median equalized income is looked at. Applying the threshold of 60 percent of median equalized income, the picture changes slightly: Poverty rates first decrease as well, but recent Eurostat figures show an increase both for women aged 65 and above and for woman aged 75 years and older. The United Kingdom can be found at the other end of the row with at-risk-of-poverty rates in almost all cases above 10 percent. France is the country with the overall smallest poverty rates. This finding is not astonishing as the French pension system is said to be quite generous and to have a very broad coverage.

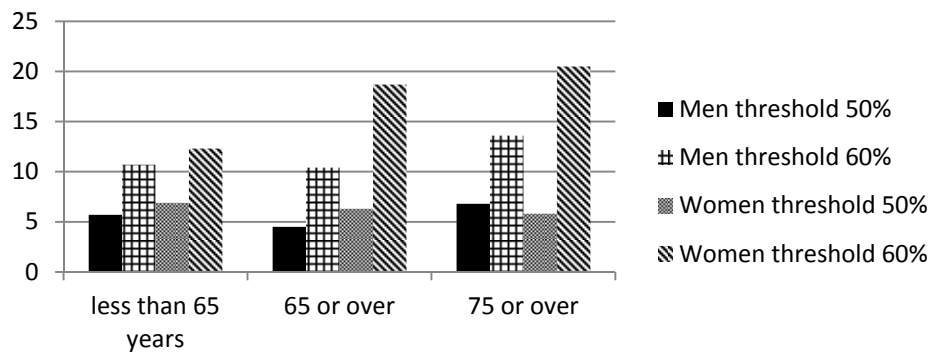
Figure 6: At-risk-of-poverty rate with different thresholds
 In percent of respective population group



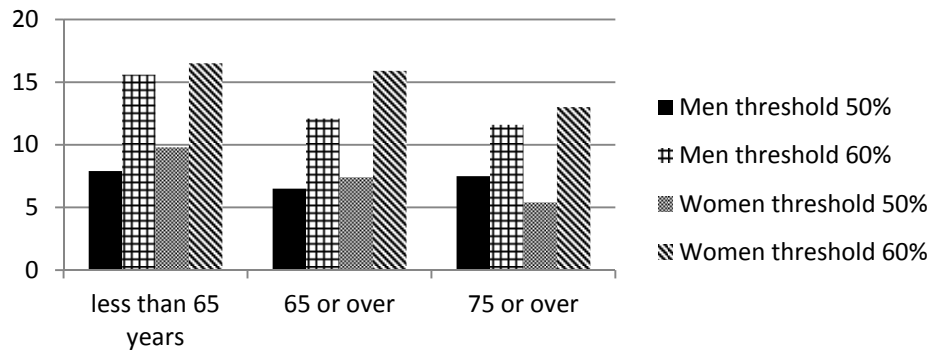
Finland



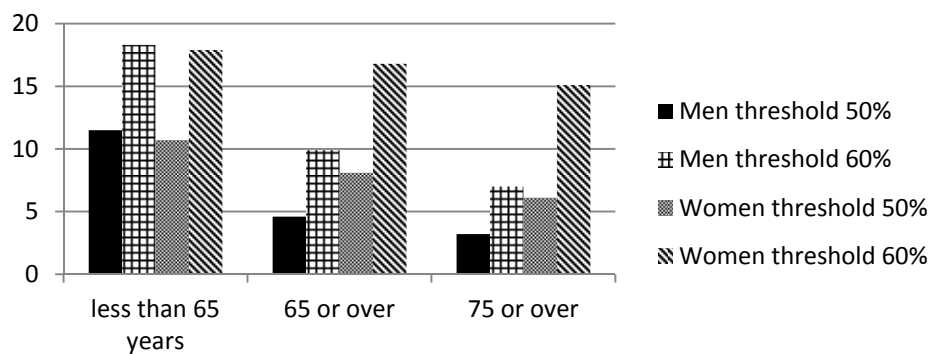
Austria

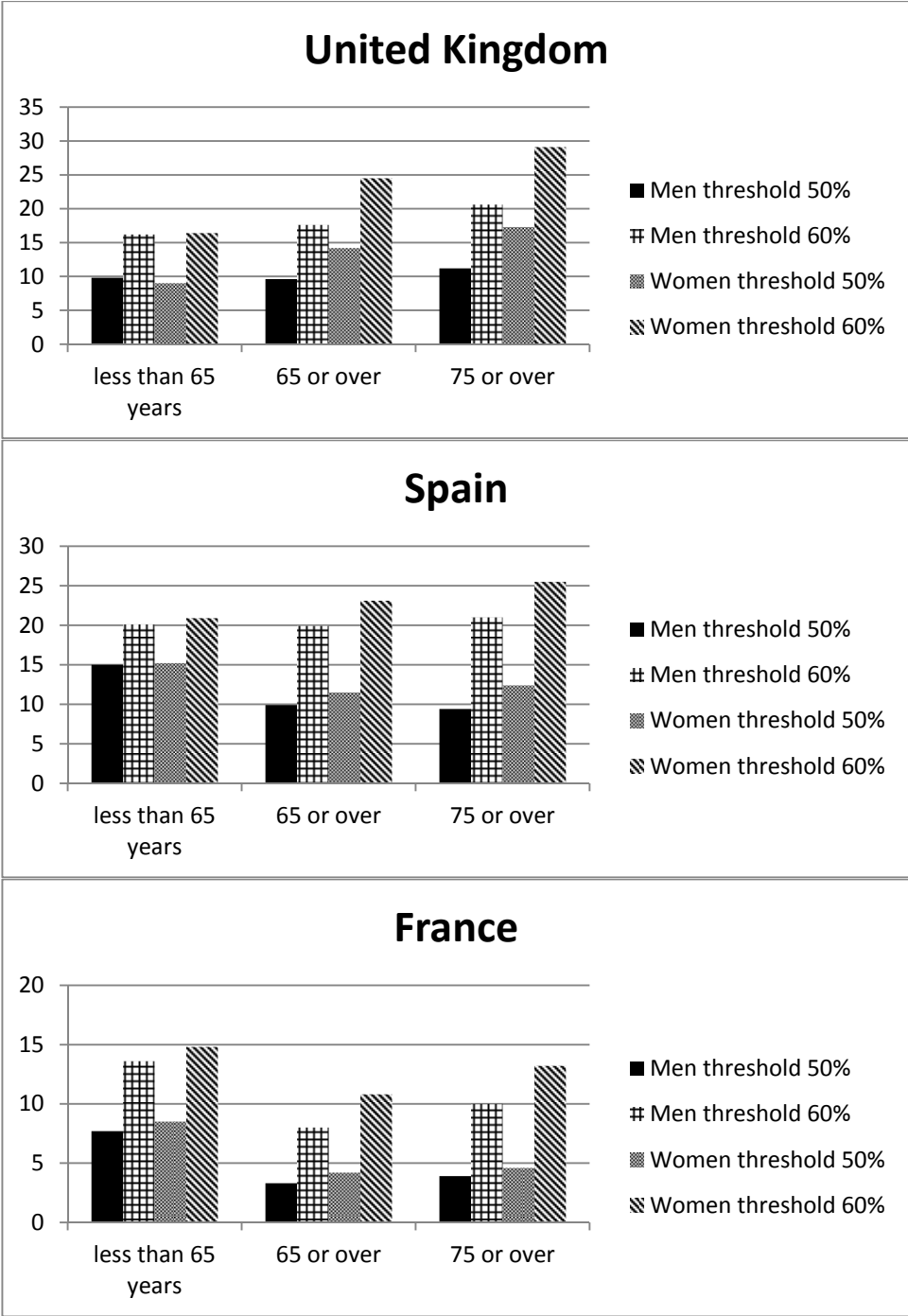


Germany



Poland





Source: Own illustration based on data from EUROSTAT

5.2 Measuring adequacy

5.2.1 Concepts and critical remarks

Often, adequacy of pension benefits is measured calculating so-called replacement rates. A replacement rate is thereby defined as the ratio of pension benefits to pre-retirement income. Both for the numerator and for the denominator there are different concepts that can be applied. Pension benefits can be measured on an individual level, as average first

retirement benefit or as an average over the entire population of retirees. The denominator can either contain final earnings or average lifetime earnings. On the one hand, applying the concept of final earnings is easy to understand and replacement rates calculated this way show the degree to which consumption possibilities change at retirement. On the other hand, final earnings may not be representative due to different reasons. Reduced work prior to retirement might lower earnings and thereby increase replacement rates. If a person experienced increasing wages over his career, final earnings are not representative of lifetime earnings. In this case, high final earnings lead to lower replacement rates.⁶¹ Applying different concepts in the denominator is more than a measuring issue: An individual concept focuses more on the ability of a pension system to smooth consumption possibilities. In contrast, applying averages tells more about avoiding poverty. Besides differences in the concepts applied, there are also differences as regards the time horizon; some concepts are applied to the current situation only while others are also used to measure future adequacy. Furthermore, some concepts assume increases in women’s labor market participation while others do not. These differences influence outcomes significantly. Thus, comparisons between variations of replacement rates are hardly possible. Table 2 presents a general view of different concepts to measure replacement of earnings.

Table 2: Different measuring concepts

Concept	Numerator	Denominator	Applied by
Replacement rates	Individual pension entitlement	Individual lifetime average earnings	OECD
Theoretical replacement rates	Individual pension income in first year of retirement	Individual departing wage	Indicators’ Sub-Group of the European Commission
Benefit ratio	Gross average pension benefit	Economy-wide gross average wage	Ageing Working Group of the EU Economic Policy Committee
Aggregate replacement ratio	Median individual gross pensions of persons aged 65-74	Median individual gross earnings of persons aged 50-59	Eurostat
Gross average replacement rate	Average first retirement benefit	Economy-wide average wage at retirement	Ageing Working Group

Source: Own illustration

⁶¹ Additionally, if one assumes that the life cycle hypothesis holds, earnings prior to retirement may not be equal to consumption as individuals seek to smooth consumption. For further details on different concepts applied in the denominator see Biggs and Springstead (2008).

Furthermore, indicators differ when it comes to pension benefits covered. Theoretical replacement rates for example include old-age and early public pensions, mandatory private pensions and other private pensions if they have a broad coverage. Other concepts in addition include disability pensions and special schemes for some groups of workers.⁶² Theoretical replacement rates assume a hypothetical career in the base case scenario. As the representative status of this hypothetical career is not the same in each country, international comparability is impaired. The calculation of theoretical replacement rates produces figures which might mislead into cross-country comparison not paying attention to underlying differences.

There are some more aspects that hamper cross-country comparisons: High replacement rates in a country where people have a short remaining life expectancy might lead to the same costs as low replacement rates in a country where people have a higher remaining life expectancy. This is especially important on a European level, as life expectancy still differs quite remarkably. Higher replacement rates can also be afforded in a country where pension benefits lose value over time due to indexation.

Finally, the question remains which benchmark should be applied. Which is the appropriate replacement rate? For lower earners a higher replacement rate may be necessary to secure sufficient means during retirement than for average or high earners. Thereby, for someone who is poor during his working life, even a one hundred percent replacement rate would not reduce his poverty risk.⁶³ Moreover, using three different concepts to measure adequacy (annual annuity, replacement rate and rate of return), Ståhlberg et al. (2005) provide a good example that outcome is heavily influenced by the measure used. Annual own annuities might be fairly low, at the same time, the replacement rate might be the highest possible, as pensioners with low income may be eligible to tax-financed benefits.

Bearing in mind all the caveats that replacement rates bring along, we decided to take a slightly different approach. For the numerator, we use the ratio of overall pension expenditure to population aged 65 and above. Thus, we almost follow the numerator

⁶² Besides pension benefits free or subsidized services or in-kind benefits play a large role in many countries. Thus, these also contribute to a full picture of adequacy.

⁶³A further in-depth description of adequacy concepts and their defects is provided by Grech (2013).

applied in the benefit ratio concept used by the AWG.⁶⁴ In our concept the denominator is simply GDP per capita. As one compares pension systems on an international level, one is not able to avoid comparing systems which cover different groups of people. Some pension systems cover the whole population while others provide benefits for larger or smaller parts of it only. Thus, using a wage concept in the denominator would bias the results.⁶⁵ Therefore, we opted for using the broadest measure possible and the purchasing power concept per se, which is GDP per capita.

5.2.2 What can replacement rates tell us? – An intertemporal comparison

Having outlined that cross-country comparisons of replacement rates are difficult, in the following it will be shown that the concept can still grant quite useful insights. Thereby the focus will not be on comparing levels between countries but rather on developments over time. Thus, replacement rates can show the impact of pension reforms. Comparing current and future replacement rates of pensions in every single country it can be assessed how changes in pension legislation due to recent reforms affect benefit levels over time.

The decline in replacement rates shown above is remarkable for all countries. In Sweden, the reduction is by far highest and will amount to 67 percent. Sweden is followed by Poland, where replacement rates decline by 64 percent. These figures give a first hint that the sustainability of the pension system has been purchased with a substantial decline in generosity of public pensions. Even the group with lowest reduction faces replacement rates 16 percent lower than today in the Spanish case and 11 percent lower in Finland. In Norway, the reduction will amount to 18 percent. However, it should be kept in mind that these figures show the impact of pension reforms only. Underlying calculations assume that except for changes caused by reforms everything else remains constant. Thus, if future generations prolonged working lives, this might cushion the decline in future replacement rates significantly. Furthermore, schemes beyond public pensions have not been considered.⁶⁶ Yet, in many countries, occupational and private pension schemes become more and more

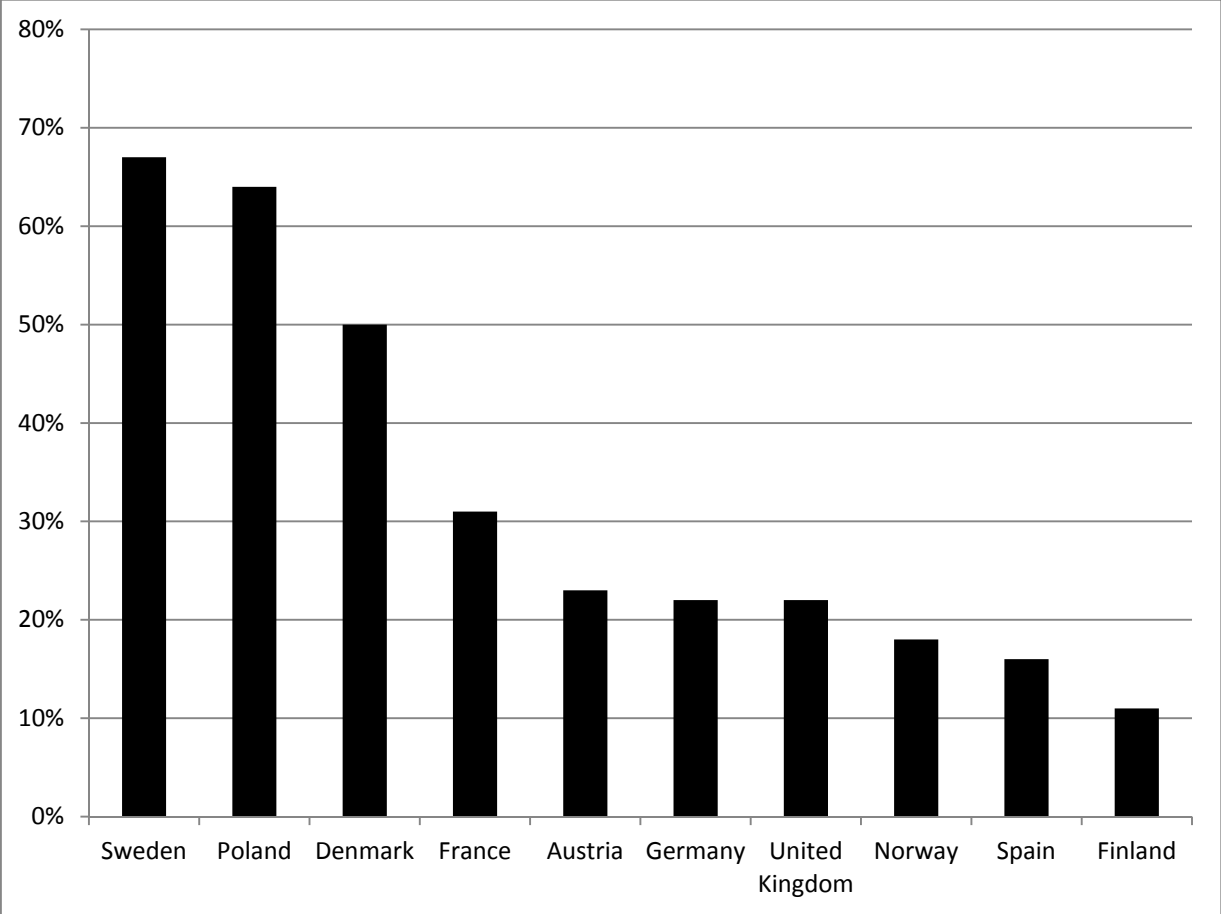
⁶⁴ The AWG calculates average pensions as public pension spending divided by the number of pensioners. As we often express measures of sustainability in per capita terms, we also do this measuring adequacy.

⁶⁵ In Germany, for example, civil servants are included in wage figures while they are not part of the pension system.

⁶⁶ This follows the concept of the whole report which focuses on public pension systems only. Additionally, quality and availability of data on other pension systems is not equally good in the countries considered.

important. This means that these schemes will probably also have a buffering effect on declining replacement rates.

Figure 7: Decline in replacement rates over the period 2010-2060



Source: Own calculations

5.2.3 Generosity of pension systems

Changes in replacement rates do not show a complete picture because the level from which the reduction starts makes an important difference. If in a very generous system the replacement of earnings before retirement is reduced, this might not endanger adequacy. In contrast, the situation is very different if one starts from a lower level.

In section 5.2.1 it was outlined that a cross-country comparison of levels of replacement rates might be misleading. Therefore, another indicator to measure pension generosity is necessary. One way to look at generosity is to consider the magnitude of a pension system.

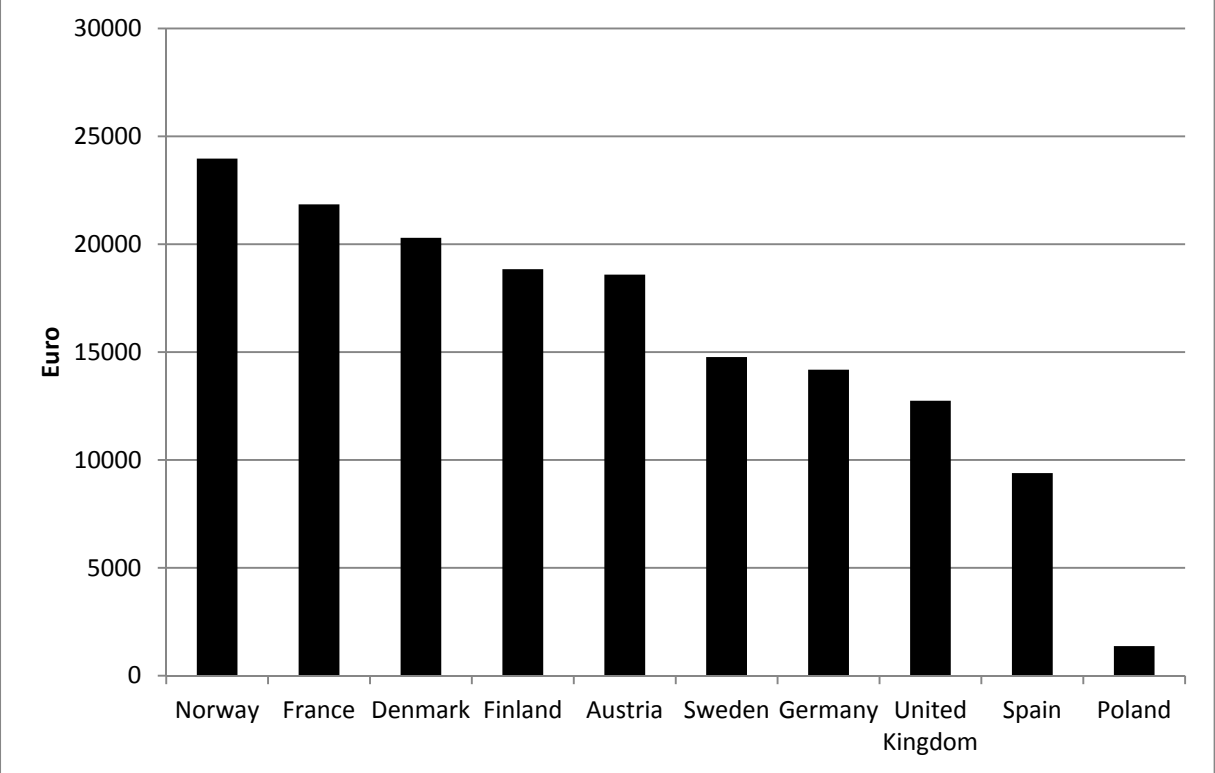
We do this by calculating pension expenditure in Euro per person aged 65 or above.⁶⁷ Figure 8 shows results for the base year. This figure might give a first glance at generosity of pension systems as it shows the absolute amount of pension payments per person in Euro. Thus, one can compare the sum an average retiree in Norway gets to the sum his counterpart in Poland is paid. Of course, this figure does not take into account the important fact that the purchasing power of one Euro in Norway is very different from the purchasing power of the same amount in Poland.

Furthermore, taxation of pension benefits differs from country to country. In Austria, Denmark, France, Poland, Spain, Sweden and in the United Kingdom general taxation rules apply without any relief for pensioners. In Norway and Finland pension benefits are subject to taxation as well, however, there are certain provisions for small pensions. Germany is in a transition period to deferred taxation at the moment. This period will last until 2039. During that period the taxable share of pension income is increased each year.

Besides taxation, countries differ as regards social security contributions from pension income. Only Denmark, Spain, Sweden and the United Kingdom do not levy any social security contributions on pensions. In the other countries, contributions have to be paid, for example for sickness insurance. In Norway, pensioners pay a lower rate of social security contributions.

⁶⁷ Of course it would be desirable to measure pension expenditure per pensioners, not per everyone at the age of 65 years or older. Yet, there are some caveats calculating this figure. First, countries differ as regards the part of elderly population which is covered by a pension system. For example, in Germany, the figure of persons aged 65 or above also entails former civil servants whose pension payments are more generous than those from the public pension system. Second, there are also different rules regarding the accumulation of pension benefits and earnings from work. If one wants to use data provided by Eurostat for the sake of comparability, one has to apply employment rates for persons aged 65 or above to calculate pension expenditure per persons in retirement. But with different rules regarding work during retirement, persons may be counted both as retirees and as part of the workforce. This in turn biases the results. A cross-country comparison of legal rules for the combination of benefit claiming and earning money from work would shed light on this question. Yet, this has to be left for future research.

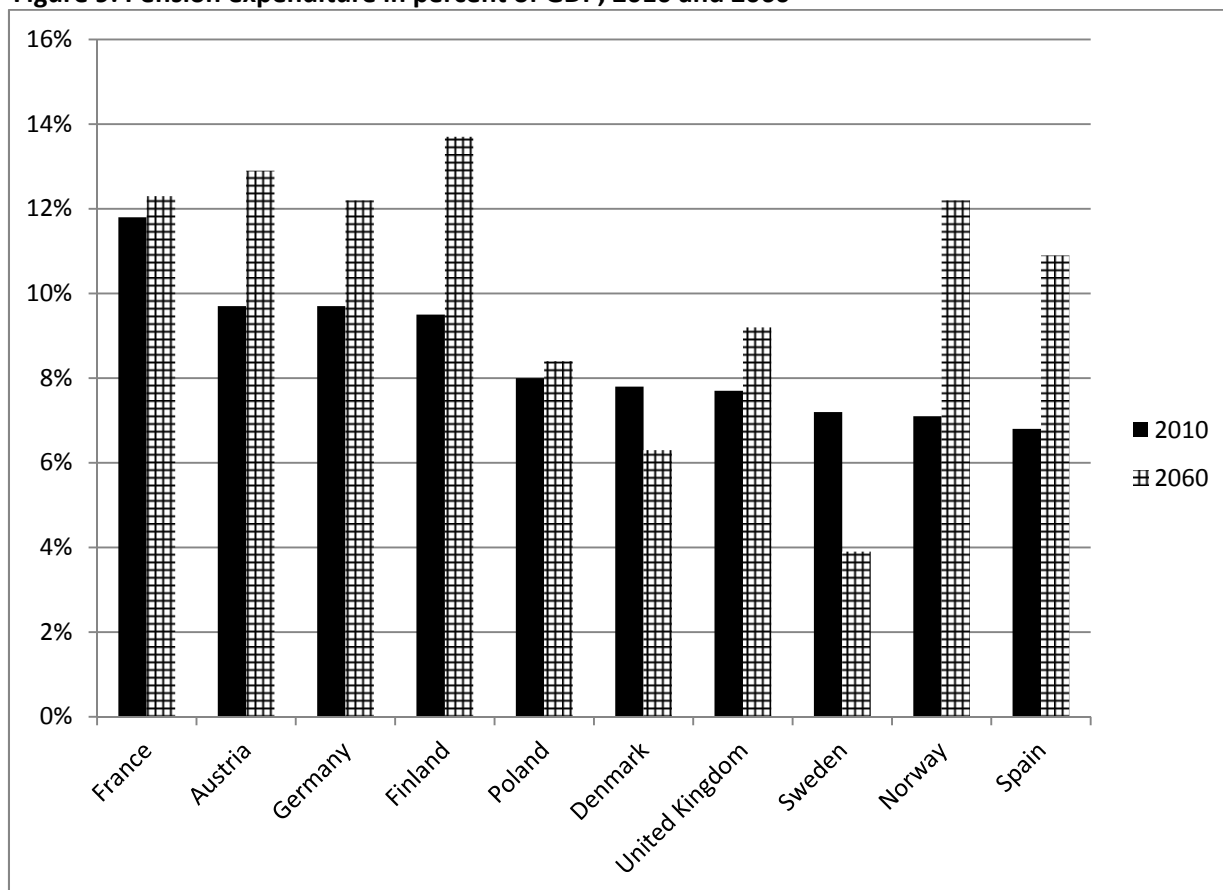
Figure 8: Pension expenditure per person aged 65 or above in Euro



Source: Own calculations

These figures show the situation as it is today. As could be seen in the previous section, replacement rates will decline remarkably. This renders the question of what will happen to pension generosity in the future. In accordance with measures applied by the AWG, we will present one last figure as regards this issue. Figure 9 shows pension expenditure in 2010 and in 2060.

Figure 9: Pension expenditure in percent of GDP, 2010 and 2060



Source: Own calculations

Only in Denmark and Sweden pension expenditures will decline.⁶⁸ Once again this is remarkable as these systems are not the most generous today and replacement rates will be cut substantially. In all remaining countries, pension expenditures rise, yet in different magnitudes. The rise is very small in Poland⁶⁹, amounting to less than one percentage point. It is rather modest in France and the United Kingdom and quite high in Finland, Norway⁷⁰ and Spain. Not surprisingly, these are the countries in which replacement rates fall to a lesser extent than in the rest of our sample.

⁶⁸ The 2012 Ageing Report shows rising figures for Sweden. The difference to our results is due to different factors: First, in the AWG calculations income indexing is assumed for all types of pensions regardless of actual legislation. Second, the AWG models the premium pension as well, while we do not include it in our calculations. The Swedish country fiche for the 2012 Ageing Report also states that with growing importance of the premium pension the public part of total pension expenditures is projected to decline. However, we are aware that our number for Sweden has a significant bias. As the Swedish replacement rate will fall, the expenditure for the guarantee pension will rise and so pension expenditures will be stabilized. This development is not modeled which leads to our biased results.

⁶⁹ In the 2012 Ageing Report of the AWG figures are falling for Poland as well. This is due to the fact that we incorporated the 2013 reform while the AWG did not. For more details on the reform see section 3.1.3.

⁷⁰ In the case of Norway, expenditure is measured in percent of mainland-GDP, as a projection of GDP in 2060 including petroleum activities was not available.

Norway at a crossroads: Going east or going south?

Up to now it might have become clear that there are several caveats concerning international comparison of pension schemes. Thus, it is easiest to compare systems which have several or most characteristics in common. Therefore, Norway, Sweden and Germany put themselves forward for a comparison.

The Swedish pension reform served as a role model for Norway. There are many differences between both systems, but still they have much in common. Pensions in Norway were calculated according to a point scheme before the reform. A point scheme is also in place in Germany. In the Norwegian point scheme, the 20 best income years formed the basis for pension calculation; in Germany the whole career is taken into account.

Norway, Sweden and Germany have undergone important pension system reforms during the past two decades. The reform steps that were taken were quite similar in the three countries. As the Norwegian and Swedish pension systems are of the notional defined contribution (NDC) type, they automatically take into account rises in life expectancy when pension benefits are calculated. In Germany population ageing is considered in the benefit formula; the ratio between contributors and beneficiaries enters the calculation procedure. Thus, in all three countries population ageing automatically affects pension benefits.

Yet, there is one important point in which the Norwegian system is distinct from the other two schemes. In Sweden, besides taking into account population ageing, the automatic balance ratio ensures that assets and liabilities in the whole pension system are balanced at any time. If this is not the case, pension entitlements grow at a smaller rate and benefit indexation is lower than usually until the balance is restored. In the German system imbalances are compensated via the contribution channel. If the system is not in balance contributions are allowed to rise to 20 percent by 2020 and to 22 percent by 2030.

As both systems achieve sustainability by different methods, this has a clear effect of the generosity of the respective system. This can be shown by another indicator, the so called internal rate of return. The internal rate of return is the counterpart to the private rate of return on capital. We calculate internal rates of return for 20 year old men and women in 2010, for Germany and Sweden. Both are fairly comparable as they are closing their Sustainability Gaps. In Sweden, on average a 20 year old male will yield an internal rate of return of minus 0.2 percent. His female counterpart is due to the higher life expectancy better off with a rate of return of 1.1 percent. In Germany both genders have higher rates of return. Germany's representative 20 year old male will receive a rate of 0.8 percent, his female peer 2.3 percent. Especially the latter is comparable among return of private funds.

Up to now, in Norway an automatic mechanism to compensate imbalances does not exist. As long as it is possible to close financial gaps via oil revenues, this might not seem to be a problem. Yet, the day might come at which Norway has to decide which way to go. Closely watching pension systems and their outcomes in Sweden and Germany might be a help in that decision.

6 Conclusion

In section one it was outlined that Norway acts under fairly good demographic premises as compared to other countries. Still, in Norway the number of pension beneficiaries will rise as well. This fact triggered far-reaching pension reforms. As regards this issue Norway has already gone further than many other European countries. Due to the introduction of the new pension system the Sustainability Gap could almost be halved. More detailed measures show that the reduction in intertemporal liabilities is not reached by burdening future generations only. Generations living today have to contribute to making the pension system more sustainable. Yet, there are some groups which benefit from provisions made to safeguard former standards, especially those close to retirement. Adequacy measures also show that in a European context Norway finds itself at a good position. On the one hand the overall poverty risk for elderly persons is quite low and the decline in replacement rates will be smaller than in many other countries. On the other hand, pension expenditure will rise considerably. Bearing in mind all this, one could say that Norway has already covered quite a distance on its way to a pension system that can meet future challenges. Yet, the goal has not been reached. This might have become especially clear through the in-detail comparison of the Norwegian pension system to its Swedish and German counterparts. The contribution showed that in Norway an automatic mechanism to compensate imbalances in the pension system does not exist. Today it is still possible to close financial gaps via oil revenues, but sometime in the future it might become necessary to decide whether a balancing system as it is applied in Sweden or a pre-defined rise in contribution rates (the German case) could be an option for the Norwegian pension system as well.

Yet it should not go unnoticed that in some countries, especially in Sweden and Poland, sustainability will be purchased at a high price. Recent pension reforms have led to financially sound systems, but at the same time it is questionable whether these systems will be able to grant adequate pension benefits in the future. This raises the question of political sustainability. Will reforms be enforced as they have been legislated or will a governmental intervention become necessary? Political pressure on pension systems is already high and it can be guessed that it will rather rise than decline in the future. Today, it is already visible that resisting this pressure is not always what politicians want. Take for example the case of Germany: After more than a decade of exemplary pension reforms, the new government

decided to take a step back as regards the postponement of retirement age. The situation is even more severe in Poland: There, large parts of the pension reform have been taken back.

This leads to the conclusion that it is always important to keep sight of one concept (i.e. sustainability or adequacy) while trying to improve outcomes of the other one. Moreover, the political dimension has to be taken into account as well. The success of pension reforms is highly dependent on whether people accept them and adapt to them or not. Thus, a transparent reform process and broad approval of reform steps taken might be helpful to create a pension system that is not only sustainable and guarantees adequate benefits but that is also politically stable.

One fact that contributes to political stability is the diversification of risks. In pension systems this is reached by basing old age provision on more than one pillar. In most European countries an expansion to more than one pillar was part of recent reforms. In some countries second and third pillars are still in early stages of development while they have a long tradition in others. It should be kept in mind that second and third pillars can only dampen reductions in public pension systems if they cover as many parts of the population as these systems do. Putting more weight on second and third pillars, politicians have to make sure that pension provision made in these pillars is affordable for a part of population as large as possible, especially for those who would be exposed to the risk of being poor relying on public pensions only.

References

- Ahonen, K. and Bach-Othman, J. (2010), Tracing Old-age Poverty – The Significance of the Household Structure on Gender Differences in the Poverty Rate in Eight EU Countries, *Finnish Centre for Pensions Discussion Papers*, 7/2010.
- Andresen, M. (2006), Pension Reform in Norway and Sweden, *Scandinavian Insurance Quarterly*, 4/2006.
- Appelqvist, J. (2012), The Life Expectancy Coefficient for 2013 According to the Employees Pension Act, Finnish Centre for Pensions Memo.
- Auerbach, A., J. Gokhale and L. Kotlikoff (1994), Generational Accounts: A Meaningful Way to Evaluate Fiscal Policy, *The Journal of Economic Perspectives*, 8 (1), 73-94.
- Auerbach, A., J. Gokhale and L. Kotlikoff (1992), Social Security and Medicare Policy from the Perspective of Generational Accounting, *Tax Policy and the Economy*, 6, 129-145.
- Auerbach, A., J. Gokhale and L. Kotlikoff (1991), Generational Accounts: A Meaningful Alternative to Deficit Accounting, *Tax Policy and the Economy*, 5, 55-110.
- Batard, P.-É., G. De Lagasnerie, A. Favrat, P. Fréhaut, C. Geay, G. Lalanne, A. Le Gougec, M. Magnien, D. Prady, L. Rambert, E. Saillard and K. Yazidi (2012), Comparaison France-Allemagne des systèmes de protection sociale, *Documents de Travail de la DG Trésor*, 2/2012.
- Biggs, A.G. and G.R. Springstead (2008), Alternate Measures of Replacement Rates for Social Security Benefits and Retirement Income, *Social Security Bulletin*, 68 (2).
- Blanchet, D. and S. Le Minez (2012), Joint Macro/Micro Evaluations of Accrued-to-date Pension Liabilities: An Application to French Reforms, *Série des Documents de Travail de la Direction des Études et Synthèses Économiques*, G 2012/14.
- Börsch-Supan, A. (2005), The 2005 Pension Reform in Finland, *Finnish Centre for Pensions Working Papers*, 1/2005.
- Bundesministerium für Arbeit, Soziale und Konsumentenschutz (2010), Gutachten der Kommission zur langfristigen Pensionssicherung für das Jahr 2010, Wien.
- Chlón-Dominczak, A. and Góra, M. (2006), The NDC System in Poland: Assessment after Five Years, in: Holzmann, R. and E. Palmer, *Pension Reform – Issues and Prospects for Non-financial Defined Contribution (NDC) Schemes*, 425-447, World Bank, Washington.
- Deeg, V., C. Hagist and S. Moog (2009), The Fiscal Outlook in Austria: An Evaluation with Generational Accounts, *Empirica*, 36, 475-499.
- Department for Work & Pensions (2013), *The Single-tier Pension: A Simple Foundation for Saving*, London.
- Deutsche Rentenversicherung Bund (2012), Rentenversicherung in Zeitreihen, *DRV-Schriften*, Band 22.

Directorate-General for Economic and Financial Affairs and Ageing Working Group (2012), The 2012 Ageing Report: Economic and Budgetary Projections for the EU27 Member States (2010-2060), *European Economy Occasional Papers*, 2.

Directorate-General for Economic and Financial Affairs and Ageing Working Group (2011), The 2012 Ageing Report: Statistical Annex – Country Fiches, *European Economy Occasional Papers*, 2.

Department for Work & Pensions (2014), <https://www.gov.uk/government/organisations/department-for-work-pensions>.

Eurostat (2014), Database, http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database.

Eurostat (2011), Eurostat Population Projections 2010-based (EUROPOP 2010): Methodology and Results of a Long-term Scenario of Demographic convergence.

Finnish Centre for Pensions (2014), <http://www.etk.fi/>.

Fredriksen, D. and N. M. Stølen (2011), Norwegian Pension Reform, Defined Benefit versus Defined Contribution, *Statistics Norway Discussion Papers*, 669.

Grech, A. G. (2013), How Best to Measure Pension Adequacy, *Centre for Analysis of Social Exclusion Discussion Papers*, 172.

Haberfellner, C. and P. Part (eds.) (2009), Austrian Pension Projections for 2007-2060, *Federal Ministry of Finance Working Papers*, 1.

Hagist, C., S. Moog and B. Raffelhüschen (2012), A Generational Accounting Analysis of Sweden, *Report in Order of the Swedish Fiscal Policy Council*.

Hagist, C., B. Raffelhüschen, A. E. Risa and E. Vårdal (2013), Long-term Fiscal Effects of Public Pension Reform in Norway – A Generational Accounting Analysis, *Nordic Journal of Political Economy*, 38 (2), 1-23.

Immergut, E.M. (ed.) (2009), *The Handbook of West European Pension Politics*, Oxford.

Jabłonowski, J. and C. Müller (2013), 3 Sides of 1 Coin – Long-term Fiscal Stability, Adequacy and Intergenerational Redistribution of the Reformed Old-age Pension System in Poland, *National Bank of Poland Working Paper*, 145.

Knell, M., W. Köhler-Töglhofer and D. Prammer (2006), The Austrian Pension System – How Recent Reforms have Changed Fiscal Sustainability and Pension Benefits, *Monetary Policy & The Economy*, Q2/06, 69-93.

Mayrhuber, C. (2004), Pensionsharmonisierung in Österreich und ihre Auswirkungen auf Frauenpensionen, *Wifo-Vorträge*, 94.

Ministerio de Empleo y Seguridad Social (2014), http://www.seg-social.es/Internet_1/index.htm.

Ministry of Children, Gender Equality, Integration and Social Affairs (2012), *National Social Report 2012*, Copenhagen.

Mutual Information System on Social Protection in the Member States of the European Union (MISSOC) (2014), Comparative Tables on Social Protection, http://ec.europa.eu/employment_social/missoc/db/public/compareTables.do?lang=en. Legal Situation as of December 2011.

Müller, C., B. Raffelhüschen and O. Weddige (2009), Pension Obligations of Government Employer Pension Schemes and Social Security Pension Schemes Established in EU Countries, *Report in Order of the European Central Bank*.

Nordic Social-Statistical Committee (2008), *Old-age Pension Systems in the Nordic Countries*, Copenhagen.

OECD (2014), OECD Statistics, <http://stats.oecd.org/index.aspx?r=929873>.

OECD (2013), *Ageing and Employment Policies: Norway 2013: Working Better with Age*, OECD Publishing.

OECD (2011), *Pension Markets in Focus*, 8.

Pensions Policy Institute (2013), *The Pensions Primer: A Guide to the UK Pensions System*, London.

Pensionsversicherungsanstalt (2014), <http://www.pensionsversicherung.at/portal27/portal/pvaportal/content/contentWindow?contentid=10007.707551&action=2&viewmode=content>.

Risku, I., K. Elo, T. Klaavo, S. Lahti, H. Sihvonen and R. Vaittinen (2012), Statutory Pensions in Finland: Long-term Projections 2011, *Finnish Centre for Pensions Reports*, 2/2012.

Risku, I. and M. Vidlund (2008), Finnish and Norwegian Pension Reform, Implications for Preparing Aged Society, *Finnish Centre for Pensions Working Papers*, 4/2008.

Ståhlberg, A.-C., A. Kruse and A. Sundén (2005), Pension Design and Gender, *European Journal of Social Security*, 7 (1), 57-79.

The Norwegian Labour and Welfare Administration (2014), <https://www.nav.no/Pensjon>.

The Swedish Pension Agency (2014), <http://www.pensionsmyndigheten.se/>.

The Swedish Pension Agency (2011), *Orange Report, Annual Report of the Swedish Pension System 2010*, Stockholm.

Vaittinen, R. and Vanne (2013), Pensions and Public Finances in Finland: A Generational Accounting Perspective, *Finnish Centre for Pensions Working Papers*, 1/2013.

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