Who pays for whom? Redistributive Effects of the Norwegian Pension Reform

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Redistributive Effects of the Norwegian Pension Reform[*]

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Abstract

After nearly a decade of political discussion, Norway is facing the biggest overhaul of its pension systems. While most research concerning these reform efforts focus on labour supply and redistribution between rich and poor, we take another perspective. Via the method of generational accounting we try to answer, firstly, if the pension reform is taking Norway a step forward to fiscal sustainability (this has been an explicit reform objective from the outset) and, secondly, which generations are paying for the reform measures. Furthermore, we are interested if differences in the expected development of life expectancy between men and women lead to redistribution among the genders.

1.   Introduction

The Norwegian National Pension Insurance Scheme (NIS) is facing its most comprehensive reform since it was introduced in 1967. The reform package is the outcome of the in 2001 appointed Pension Commission. The Pension Commission was summoned as Norway, like most OECD countries, is facing a demographic ageing process. Demographic ageing in connection with a pay-as-you-go insurance scheme like the NIS presupposes the need for reform – more precisely, an intervention to control the increase in the future old-age pension expenditures and thus to secure sustainable funding. The pension reform was approved by the Norwegian parliament (*Storting)* in 2007 and is to take effect from 2010 onwards.

The result of the Pension Commission is a reform proposal containing elements which can also be observed in recent pension reforms in other OECD countries. This in particular comprises the component of stimulating employment, i.e. moving towards a more actuarially fair pension system, as well as – and this accounts for population ageing – improving long run fiscal sustainability by implementing indexation rules that act to reduce growth in public old-age expenditures.[1]

While ongoing research on the Norwegian pension reform has mainly been concerned with analyzing effects on labour supply as well as on income redistribution we want to focus on inter- and especially on intragenerational redistribution effects arising from the reform. In particular, we focus on the redistribution effects caused by the cuts in generosity due to the indexing of benefits with national life expectancy – i.e. the indexation of benefits with average gains in life expectancy.

"The quiet revolution" is how the OECD (2007a) labels the indexing of benefits via life expectancy, as it is part of the pension reform of various countries and, most importantly, very efficacious in getting expenditures under control. Having a mechanism which automatically adjusts pensions if national life expectancy changes is a powerful way to counteract demography induced problems within social security. In the framework of this paper we are – as mentioned above – mainly concerned with redistributive effects stemming from indexing pension benefits with average and not with sex-specific gains in life expectancy. While it is beyond question that this policy measure is generally a useful instrument to secure more sustainability, we want to point to the fact that the indexing in line with average gains in life expectancy includes intragenerational redistribution – men and women exhibiting different absolute life expectancies – which might either not be intended or where the magnitude of the redistribution is simply unclear or underestimated by politicians. So this particular redistribution effect stems from the fact that the indexing of benefits does not include an actuarial

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[1] For an overview of pension reforms in the OECD countries, see Disney (1999) and OECD (2007b).

consideration of life expectancy but only a consideration of average gains in life expectancy which in turn can only be stated to be "quasi-actuarially" fair. Apart from illustrating the intergenerational redistribution effects it is thus purpose of this paper to quantify these intragenerational redistribution effects taking all other redistributive flows as given.

The paper is organized as follows: Section 2 provides a brief overview of the design of the present Norwegian pension system and of the main elements of the reform proposal. Section 3 illustrates the sustainability as well as all inter- and intragenerational redistribution effects resulting from the pension reform. Section 4 concludes with a short summary.

2.   Status quo and the 2010 pension reform

Pension benefits are granted by the Norwegian National Insurance Scheme (NIS), an insurance scheme which also covers disability, sickness, unemployment, and compensation for families with children. The Public Pension Scheme is a mandatory, defined benefit system on a pay-as-you-go basis.[2] Old-age pensions consist of a universal basic pension (*Grunnpensjon*) as well as the maximum of a means-tested special supplement and an earnings-related supplement (*Tilleggspensjon*).[3] While the basic pension is independent of (possible) labour market participation, the amount of the supplementary pension depends on the number of pension-earning years and the yearly pension points, which again are derived from the previous labour market earnings. So far, only the twenty best income years were used to calculate the earnings-based pension and the number of entitlement accumulation years was capped to forty years – two regulations implying a weak income dependency of pension benefits.[4] The official retirement age in the present system is 67 years.[5] However, due to a special early retirement scheme (AFP), most people (over 60 per cent of the working population) can retire at the age of 62 years with no reduction in the pension amount – neither because of a shorter period of labour market earnings nor through a longer period as pensioner. Including disability pension, the present effective retirement age averages about 60 years in Norway.[6] Needless to say, an effective retirement age of just 60 years only aggravates the funding problem of the pension scheme. The pension scheme being on a pay-as-you go basis, i.e. the active population financing

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[2] The NIS is financed by contributions from employees, self-employed persons and employers and is additionally supported by the state, i.e. by the Government Pension Fund. For further details concerning the Government Pension Fund, see Ministry of Finance (2009).

[3] The supplementary pension is either earnings-related or means-tested which guarantees a minimum income for all pensioners.

[4] Simulations as in Stensnes (2007) and Holmøy and Stensnes (2008) show that increasing earnings by 1 NOK raises the average present value of future pension benefits by only 0.10 NOK. Note that this income dependency is hard to compute ex-ante, and varies highly across individuals, which probably weakens the labour supply incentive of the income dependency even more.

[5] The retirement age was reduced from 70 to current 67 in 1973.

[6] See Fredriksen et al. (2007).

the pension benefits of the passive population, together with the ageing of the population characterized by an increase in life expectancy and decreasing fertility rates necessitates a comprehensive reform. The pension reform the Norwegian parliament agreed upon and which is to take effect from 2010 basically seeks two goals: first to neutralize the expenditure effect due to demographic ageing or rather due to growth in life expectancy and second to strengthen ties between former earnings and pension benefits. In detail, the reform comprises the following elements:[7]

To control for the growth in expenditures two indexing rules are applied. (1) A mix of wage and price growth indexation: income dependent pension entitlements will be indexed by wage growth until retirement, the pension benefits, however, will be adjusted by wage growth minus 75 basis points (or zero in the case of low or negative wage growth) only. Pensions will thus not be increased completely in step with national wage increase rates. In other words, pensioners' purchasing power will be below the work force's. (2) Moreover, an indexation in line with average gains in life expectancy, a "life expectancy adjustment ratio", is to be implemented to ensure that pension payments are adjusted with the life expectancy of the population at large. If life expectancy increases, a quasi-actuarial mechanism[8] kicks in and reduces annual benefits as the expected length of the retirement period increases. The indexation of pension benefits to changes in national life expectancy effectuates cuts in pension generosity.[9]

The actions taken in order to stimulate labour supply are: (1) The lowering of the implicit tax by making the supplementary (income based) pension more actuarially fair with benefits calibrated to the entire working life. (2) The introduction of a flexible retirement age (starting from 62 years) based on an actuarial adjustment of the yearly benefit.

As it is not clear cut how individuals will behave – firstly as a consequence of making pensions more actuarially fair (see Holmøy and Stensnes (2008)) and secondly as a consequence of introducing a flexible retirement age (until there is an accompanying reform of AFP and public occupational pensions, little increase in labour supply can be expected from the old age pension reform in isolation) – we will abstract from these reform elements in our calculations on fiscal sustainability. Instead, we focus on sustainability and redistribution effects resulting from (1) the mix of wage and price indexation of the pension payments, i.e. their indexation with the *wage*

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[7] For a comprehensive overview of all reform details see Risku and Vidlund (2008) and Ministry of Labour and Social Inclusion (2009).

[8] The mechanism implemented is only quasi-actuarially fair, as the indexing of benefits does not include an actuarial consideration of life expectancy but only a consideration of average gains in life expectancy.

[9] If the average life expectancy rate increases, employees will have to stay longer in employment to be entitled to the same present value of total pension, or accept lower annual pension payments and thus a lower present value of total pension benefits. An increase in the expected number of retirement years reduces the annual benefit such that the present value of total pension benefits is nearly invariant to changes in current remaining life expectancy and retirement age.

growth minus 75 basis points as well as from (2) the indexation of pension benefits with average gains in life expectancy in reference to the 56-year-old cohort in 2010.[10, 11]

3.   Redistributive Effects

To quantify all sustainability and redistributive effects we use the method of *Generational Accounting*.[12] This approach is based on the intertemporal budget constraint capturing all present and future payment and transfer flows between an individual and the public sector, thus allowing for statements on the long-term implications or rather the fiscal balance of a current policy. For a detailed description of the method – giving special consideration to Norway – see Fichtner and Hagist (2008).

In the following, the year 2007 represents the base year of all our calculations. The underlying data comprise the medium variant of the population projection of Eurostat (EUROPOP),[13] age- and sex-specific profiles and the general government budget of the base year. For a detailed description of all data used see Fichtner and Hagist (2008). Concerning the interest and growth rates, we take a standardized growth rate (g) of 2.0 per cent, thus following the official assumption of the Norwegian government, and an interest rate (r) of 3.0 per cent. This interest rate is lower than the government assumption of 4.0 per cent. We nevertheless opt for a lower interest rate as this depicts a better fit from past data.

3.1 Intergenerational Redistribution

The fiscal gap of the whole Norwegian public sector in our standard demographic scenario (EUROPOP – *medium variant, g=2%, r=3%)* amounts to 359.2 per cent of the base years GDP.[14] This sustainability gap consists of an implicit and explicit (or public) debt as well as of petroleum wealth and the Government Pension Fund (GPF) – a detailed description of the Norwegian sustainability gap and the multiple components is shown in table 1. The implicit debt of the

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[10] Concerning the reference point, i.e. the 56-year-olds in 2010 for indexing pension payments with average gains in life expectancy, we want to remark that in the original pension reform plan the group of 67-year-olds was earmarked as reference. The effects of taking a younger reference group are smaller cuts in pension generosity but as a direct consequence also less sustainability. The reason for lesser cuts in generosity due to an indexing with average gains in life expectancy is straightforward as the gains in years of life are bigger when comparing the cohort passing into retirement with the group of 67-year-olds compared to the 56-year-olds.

[11] In the following analysis, the pension reform elements employed are in some respect idealized as the actual reform plan envisages a less brisk proceeding. The indexing with average gains in life expectancy e.g. is only to be installed as of 2018. In order to exemplify the reform-induced intragenerational effects, we nevertheless choose to completely implement the reform from 2010 onwards, as this illustrates (today) what actually happens on the intragenerational level (tomorrow). The intergenerational dimension is affected by this procedure in a way that all results shown are too optimistic (or rather overestimated) concerning the sustainability impact of the reform.

[12] This method goes back to Auerbach, Gokhale and Kotlikoff (1991, 1992, 1994). See Fichter and Hagist (2008) for a detailed description including the methodology used in this study.

[13] In the medium variant of EUROPOP, the life expectancy of females/males is 82.7/78.2 in 2007 and rises to 89.2/85.2 in 2060.

[14] The difference in the fiscal gap as specified in Fichtner and Hagist (2008) are mainly due to different assumptions on the growth rate.

Norwegian fiscal policy (taxes not related to oil, social security contributions, expenditures for health and public pension, etc.) is 533.2 per cent of GDP. Public or explicit debt was 52.0 per cent of GDP 2007. The GPF holds assets worth 78.3 per cent of GDP, and the present value of petroleum-related revenues amount to 147.6 per cent of 2007 GDP. While the Norwegian public sector as a whole evidently faces rather favourable conditions, fiscal policy in its core is not sustainable.

Table 1: Overview of the components of the fiscal gap
(EUROPOP - medium variant, g=2.0%, r=3.0%)

	Sustainability Indicators	Public Sector
in % of GDP (2007)	Implicit Debt	533.2
	Explicit Debt	52.0
	Petroleum Wealth	-147.6
	GPF	-78.3
	Fiscal Gap	359.2

Source: Own calculations.

Having identified the former status quo which manifests a fiscal gap of 359.2 per cent of GDP we now turn to the "new status quo" embracing the pension reform to be enacted in 2010 (see table 2). Regarding only the indexing of the pension benefits with the average of wage and price growth (i.e. the reduction of the wage growth by 75 basis points) reduces the fiscal gap to 258.1 per cent of GDP. This reduction in implicit liabilities is due to the fact that the mixed indexation is less generous compared to the former, namely pure wage growth indexation.

Focusing on the effect of indexing pension benefits with average gains in life expectancy reduces the fiscal gap further to 139.9 per cent of GDP. The incorporation of this quasi-actuarial mechanism reduces annual benefits as the expected length of the retirement period increases with an increase in life expectancy. The expenditure risk associated with increases in longevity is thus shifted from tax payers onto pensioners. The fact that both reform measures reduce the fiscal gap means that future generations are disburdened while living generations are obliged to participate more intensely in the (their own) economic and demographic development – thus not being able to shift all outcomes of this development onto future generations. From the analysis so far, we can thus state that the 2010 pension reform is a first big step towards long term fiscal sustainability for Norway.

Table 2: The effects of the pension reform on the fiscal gap of the Norwegian public sector
(EUROPOP - medium variant, g=2.0%, r=3.0%)

in % of GDP (2007)		Status quo	Mixed indexing of wage and price growth	Indexing with average gains in life expectancy
	Implicit Debt	533.2	432.1	313.9
	Explicit Debt	52.0	52.0	52.0
	Petroleum Wealth	-147.6	-147.6	-147.6
	GPF	-78.3	-78.3	-78.3
	Fiscal Gap	359.2	258.1	139.9

Source: Own calculations.

The burden shift onto presently living generations and the extent to which each cohort is affected by the pension reform can be illustrated by the reform-induced burdens of all living cohorts in 2007 which are displayed as annuities in figure 1. Looking at the annuitized burdens of the living generations reveals the following picture: indexing the benefits with average price and growth burdens all generations of the 0- to 60-year-olds in 2007 – yet seemingly to a different extent. The reason for the seemingly greater burden of the middle-aged generations in 2007 is merely the result of discounting and expressing the burdens as annuities. In other words, the different burdens resulting from the mixed indexing cannot be viewed as differences in real terms. Thus, the cut in generosity through the combined indexing is – in absolute terms – the same for all generations affected by the reform. Over the lifecycle, however, the burden caused by mixed indexing is relatively smaller the younger a generation is.

In contrast to this, the indexation with average gains in life expectancy aggravates the burden for the respective generations – this time in real terms. Compared to the mixed indexing of wage and price growth, the indexing with average gains in life expectancy is relatively stronger the younger a generation. This is clear-cut as with an increasing life expectancy the pension benefits are continually adjusted, thus resulting in lower lifetime pension transfers compared to the "old status quo", i.e. before the pension reform. So the difference in burdens induced by the indexing with average gains in life expectancy is in effect a difference in real terms. This also becomes clear when looking at the bar chart in figure 1: the decrease (from old to young) is not as steep as in the case of mixed indexing. Due to the life expectancy adjustment young generations experience a bigger absolute cut in pension generosity than older generations. However, all generations aged 15 years and younger in the base year experience an identical real burden, as all these (and succeeding) generations have identical gains in life expectancy. So the seemingly different burdens for the cohorts aged 15 years and younger (as depicted in figure 1), is in turn solely due to the illustration as an annuity.

Figure 1: Age-specific reform-induced burdens (annuity)
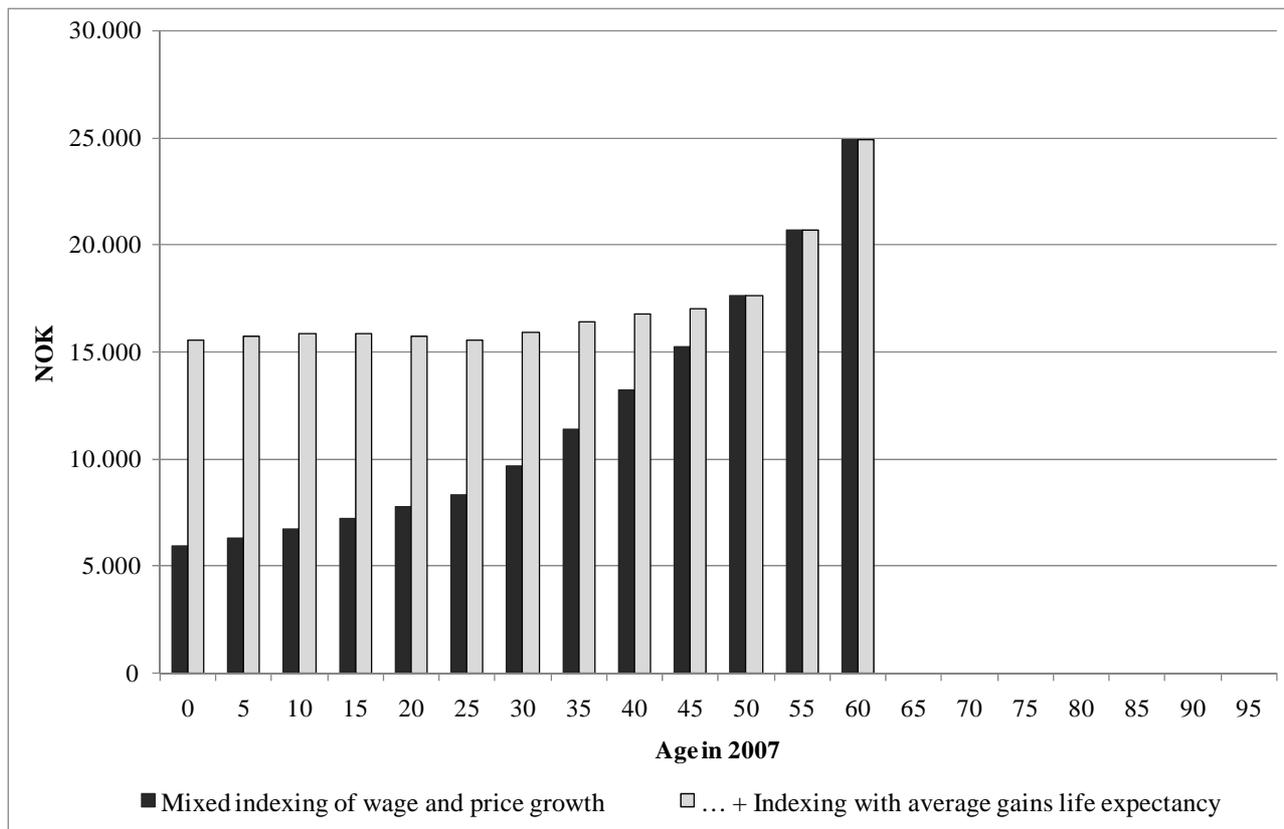
Source: Own calculations.

As the pension reform intends clear cuts in generosity of the pension benefits it is of course not surprising that there is intergenerational redistribution – for the goal is plain fiscal sustainability. In an ageing society and under pay-as-you-go systems this is only feasible by burdening the living and thereby disburdening future generations. The subsequent section raises the question how the indexation rule "indexation with average gains in life expectancy" affects men and women differently given that women already have a higher life expectancy than men in the first place.

3.2 Intragenerational Redistribution

3.2.1 Standard Scenario

The intragenerational redistribution effect is best shown analyzing the so-called *accrued-to-cohort implicit liabilities*.[15] Accrued-to-cohort liabilities capture all payment flows to and from the public sector of a respective cohort over the remaining life-cycle. For the illustration of intragenerational redistribution effects, it is sufficient to consider the accrued-to-cohort liabilities of all living generations (in the following: accrued-to-living-cohorts) and the accrued-to-cohort

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[15] Concerning the intragenerational redistribution, we neither refer to the dimension of income earnings nor individual longevity risks, two parameters which in addition are mostly positively correlated, but rather on the redistribution between men and women due to their sex-specific life expectancy.

liabilities of all future generations (in the following: accrued-to-future-cohorts). Concerning the living generations we will distinguish between men and women – the (only) intragenerational dimension considered here.

The intragenerational, or to be more specific, the gender redistribution we want to point out here is induced by the fact that indexing is fulfilled with average gains in life expectancy although the absolute life expectancy of men and women are different. As the absolute life expectancy of men is lower than that of women, the overall gain in years of life (roughly 6.5 - 7 years) is relatively larger for men than for women. The gain in life expectancy for women (men) will be from 82.7 (78.2) years for a newborn in 2007 to 89.2 (85.2) years for a newborn in 2060, i.e. 6.5 (7.0) years. Looking at the gains in conditional life expectancy for 56-year-olds over time reveals a similar picture:[16] the gain in life expectancy will be 6.2 (6.3) years from 82.9 (78.9) years for 56-year-old women (men) in 2007 to 89.1 (85.2) years of age for 56-year-old women (men) in 2060. Figure 2 depicts the future development of the remaining life expectancy at age 56.

Figure 2: Gains in conditional life expectancy for 56-year-olds
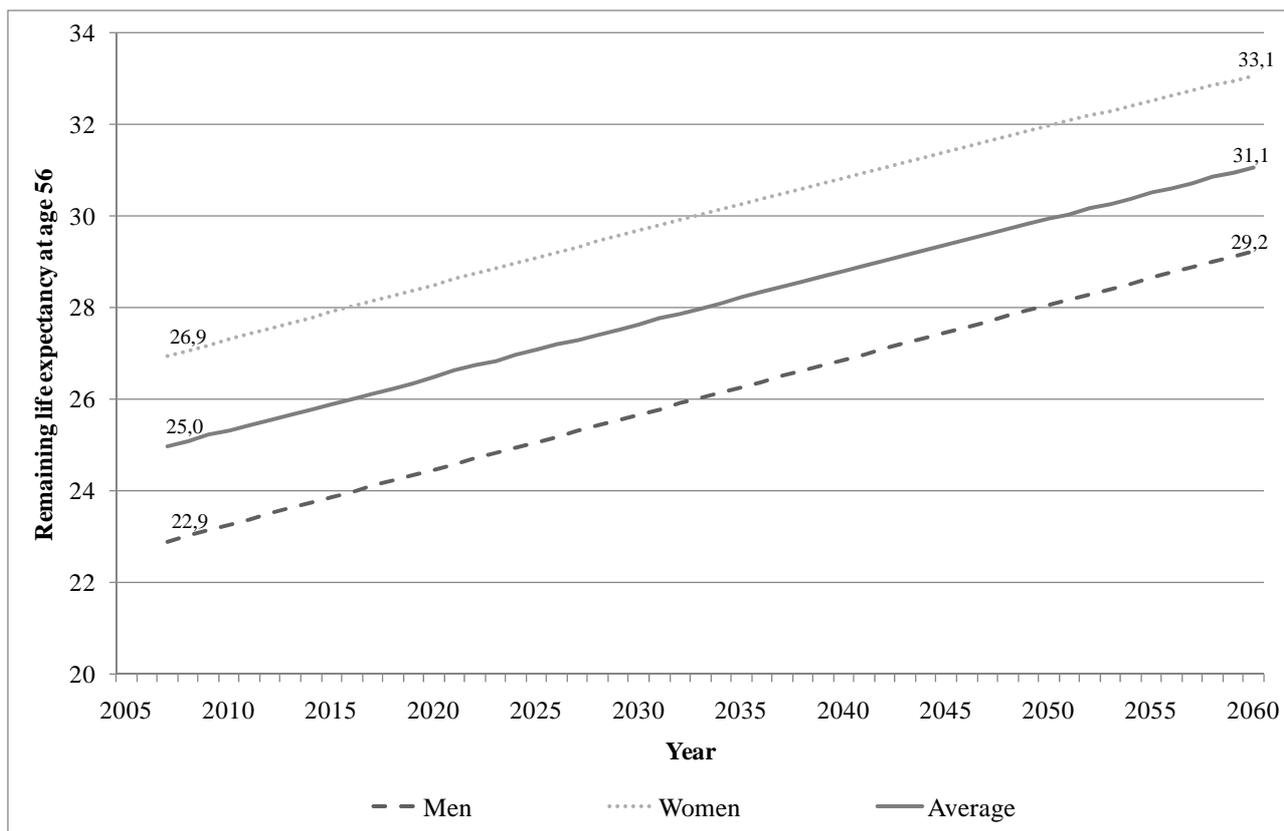
Source: Own calculations.

As mentioned before, even if the absolute gain in life expectancy were the same for men and women, men would clearly have a bigger relative gain in years of life. In fact, the absolute

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[16] The remaining life expectancy is illustrated for the age of 56 as this is the benchmark of the reformed indexation rule.

gain is actually higher which further increases the differential in relative gains. From the indexation with average gains in life expectancy it generally follows that the higher the gain in life expectancy the bigger the cuts in generosity. Thus, men and women exhibiting different relative gains in life expectancy but at the same time having an indexation rule based on average gains inevitably produces (relative) winners and losers. The indexation with average gains in life expectancy always benefits the group that has a bigger relative sex-specific gain in life expectancy as gains in life expectancy are directly translated into cuts in pension generosity. Hence, the group with big relative sex-specific gains in life expectancy is better off with the average indexation as this entails lesser cuts in pension benefits compared to the sex-specific indexation.

Table 3: Sex-specific-effects of the pension reform on the accrued-to-living-cohorts implicit debt
(EUROPOP - medium variant, g=2.0%, r=3.0%)

	Status quo	Mixed indexing of wage and price growth	… + Indexing with average gains in life expectancy	… + Indexing with sex-specific gains in life expectancy
Living Females	330.0	308.3	295.2	295.5
Living Males	-62.6	-89.3	-107.5	-109.4
Living Total	267.4	219.0	187.7	186.1
Future Females	480.4	457.3	421.1	422.4
Future Males	-214.7	-244.2	-294.9	-300.2
Future Total	265.8	213.1	126.2	122.2
Fixed	-174.0	-174.0	-174.0	-174.0
Fiscal Gap	359.2	258.1	139.9	134.4

in % of GDP (2007)

Source: Own calculations.

A result shown in the previous section is that (living) men and women are both burdened by the reform – by the mixed indexing as well as by the indexing with average gains in life expectancy. What is really of interest now, is how the burden of men and women varies when considering a hypothetical pension reform – as opposed to the actual reform – which indexes the pension benefits not with average but with sex-specific gains in life expectancy. Simulating this hypothetical reform scenario leads to the following result: women would be burdened less, men would be burdened more in comparison to the actual reform "indexing with average gains in life expectancy". This shows when comparing the accrued-to-living-cohorts implicit liabilities under the actual reform and in the hypothetical reform scenario which comprises an indexation with sex-specific gains in life expectancy. Under the actual reform, the accrued-to-living-cohorts implicit debt of women decreases from 330.0 per cent of GDP to 295.2. This drop in implicit debt

is equivalent to cuts in women's pension benefits. In the case of the hypothetical (sex-specific) scenario the accrued-to-living-cohort implicit debt drops to 295.5 per cent of GDP "only". In other words, the accrued-to-living-cohort implicit debt of women is by 0.3 percentage points higher than under the actual reform, which implies smaller cuts in pension generosity for women in case of the hypothetical scenario.

Considering the situation of men in the actual reform and the hypothetical scenario, respectively, leads to the following results: the accrued-to-living-cohorts implicit liabilities (or in this case, "assets" from the view of the state) of men fall from -62.6 to -107.5 per cent of GDP in case benefits are indexed with average gains in life expectancy. But the implicit assets falls even more, i.e. to -109.4 per cent of GDP, if an indexing with sex-specific gains in life expectancy takes place. Men would thus have to carry a higher burden, if the indexing is chosen to be more actuarially fair, i.e. fitted to sex-specific survival rates.

A further result of the indexing with average gains in life expectancy is the effect this reform measure has on future generations. Obviously, future generations are burdened most by the sex-specific indexation as they have the smallest implicit liabilities in this scenario (122.2 per cent of GDP). The reason for this is that the *negative* (income) effect for future men – which is induced by the fact that the pension benefits are reduced more accurately with the sex-specific than with the average indexation – outweighs the *positive* (life expectancy) effect for future women, the latter being driven by the "fairer" treatment of women facing smaller cuts in generosity.

To exemplify all specified effects, we employ two further scenarios on varying life expectancy. We vary only the life expectancy of men keeping all other demographic factors (fertility and net migration) constant. Two scenarios are analyzed, one indicating an upper bound for the gain in life expectancy of men, the other a lower bound for the gain in life expectancy of men. As an upper bound the life expectancy of men is set to 87.2 years – two years short of female life expectancy. In this upper bound scenario, men experience a significant absolute and relative gain in life expectancy compared to women. In the lower bound scenario the life expectancy of men is set to 83.2 years. This is two years below the EUROPOP-estimate. In this case, men gain less life expectancy – in both relative and absolute terms.

3.2.2 Alternative life expectancies

Upper Bound

The upper bound scenario illustrates the case of men not only having relative higher gains in life expectancy (compared to women), but also in absolute terms. In this setting where the life

expectancy of men only falls short of two years of that of women, the overall fiscal gap of course is bigger, as there are more implicit liabilities from the pension system.[17]

In the following analysis, we concentrate on the effects of the indexation rules with average and sex-specific life expectancy, but for the sake of completeness all results are displayed in table 4. The mixed wage-price indexing and the indexing with average gains in life expectancy jointly reduce the fiscal gap by 248 percentage points, i.e. from 430.6 to 182.6 per cent of GDP. As shown above, indexing with sex-specific gains in life expectancies would generate even more intergenerational equity by reducing the fiscal gap to 173.5 per cent of GDP. As we are mainly interested in intragenerational redistribution we turn to the accrued-to-cohorts implicit liabilities, again.

Table 4: Sex-specific effects of the pension reform on the accrued-to-living-cohort implicit debt
(EUROPOP - medium variant, g=2.0%, r=3.0%)

Upper Bound: Life expectancy of men only falls short of 2 years (87.2) of that of women

in % of GDP (2007)	Status quo	Mixed indexing of wage and price growth	… + Indexing with average gains in life expectancy	… + Indexing with sex-specific gains in life expectancy
Living Females	330.0	308.3	293.3	295.5
Living Males	-33.5	-63.0	-85.2	-90.1
Living Total	296.5	245.3	208.1	205.4
Future Females	480.4	457.3	416.3	422.4
Future Males	-172.4	-206.0	-257.9	-280.4
Future Total	308.0	251.3	148.4	142.0
Fixed	-174.0	-174.0	-174.0	-174.0
Fiscal Gap	430.6	322.6	182.6	173.5

Source: Own calculations.

As the life expectancy of women remains unchanged, neither do their accrued-to-living-cohorts implicit liabilities alter, except when the average gain in life expectancy is used to index the pension payments. In this case, i.e. men experiencing a higher gain in life expectancy thus raising the average gain in life expectancy, the following results hold: a bigger gain in life expectancy is equivalent to bigger cuts in pension generosity, women are burdened the more the higher the life expectancy of men. This results shows, when looking at the accrued-to-living-cohorts implicit debt of women. Using an indexation path with average life expectancy reduces

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[17] For the purpose of comparison: in the standard scenario, the life expectancy of men falls short of four years of that of women.

the accrued-to-living-cohorts implicit debt of females to 293.3 per cent of GDP. Recall that in case of the hypothetical reform scenario, i.e. indexing pension benefits with sex-specific gains in life expectancy, the accrued-to-living-cohorts implicit debt is reduced to 295.5 per cent of GDP only thus burdening females less.

With a higher life expectancy than in the standard scenario, the accrued-to-living-cohorts implicit debt of the male population is always higher than in the standard scenario. The actual pension reform reduces the accrued-to-living-cohorts implicit assets of men to -85.2 per cent of GDP, i.e. in case of indexing benefits with average gains in life expectancy. But again, compared to the hypothetical scenario of indexing benefits with sex-specific gains in life expectancy men are better off with the indexation rule via average life expectation. The latter would lead to a drop in their implicit assets to -90.1 per cent, i.e. men experience higher cuts in their pension benefits if the gender specific indexation rule applies. The results in this upper bound setting are straightforward, as the relative gain in life expectancy is even bigger compared to the standard scenario. Hence, all the results of the standard scenario are boosted. This is also true for the effect on future generations.

Lower Bound

Let us now turn to the lower bound setting in which men experience a gain in life expectancy but this falls two years short of what EUROPOP predicts. Hence, we consider a situation of men gaining absolutely and relatively less in life expectancy compared to women.

In this setting, the total fiscal gap starts off at a lower level, as the implicit liabilities of the pension system are smaller with an on average lower life expectancy. The indexing of benefits with a mix of prices and wages reduces the fiscal gap from 291.4 to 196.8 per cent of GDP. Indexing with average life expectancy further reduces the fiscal gap to 99.2 per cent of GDP. In the hypothetical reform scenario of indexing benefits with sex-specific life expectancy the fiscal gap drops to 97.0 per cent of GDP thus disburdening future generations to a maximum.

Again, we want to turn to the gender implicit debts. Which effects occur in case of low average life expectancy? As a lower life expectancy is equivalent to smaller cuts in pension generosity, looking at the implicit debt of women shows that they are now better off with the average life expectancy indexing (297.0 versus. 295.5 per cent of GDP) as this is equivalent to smaller cuts in generosity. This is because men gain relatively less in life expectancy compared to women. Men, on the other hand, would now be better off via sex-specific indexing (127.8 versus 128.6 per cent of GDP) as this means smaller cuts in generosity for them.

Future generations are burdened most by the sex-specific indexation (103.2 versus 104.8 per cent of GDP with average indexing) anyway. The reason for this is that the *negative* (life expectancy) effect for future women – which is due to the fact that the pension benefits are

reduced more accurately with the sex-specific than with the average indexation – outweighs the *positive* (income) effect for (future) men – the effect, that men are treated fairer in the sex-specific scenario facing smaller cuts in generosity compared to the case of average indexing.

In all three scenarios, future generations (men and women) are burdened most by the sex-specific indexation, i.e. they have the least implicit liabilities (accrued-to-future-cohorts implicit debt). The fact that the fiscal gap declines in all considered examples is simply the consequence of the fiscal gap being calculated as a residual. In other words, it is quite possible that a case occurs in which the fiscal gap shows the same absolute value in both scenarios of average and sex-specific indexation.

Table 5: Sex-specific effects of the pension reform on the accrued-to-living-cohorts implicit debt
(EUROPOP – medium variant, g=2.0%, r=3.0%)

Lower Bound: Men fall 2 years short (83.2) of what EUROPOP predicts

	Status quo	Mixed indexing of wage and price growth	… + Indexing with average gains in life expectancy	… + Indexing with sex-specific gains in life expectancy
Living Females	330.0	308.3	297.0	295.5
Living Males	-90.0	-114.1	-128.6	-127.8
Living Total	240.0	194.1	168.4	167.7
Future Females	480.4	457.3	425.9	422.4
Future Males	-255.1	-280.7	-321.1	-319.2
Future Total	225.4	176.6	104.8	103.2
Fixed	-174.0	-174.0	-174.0	-174.0
Fiscal Gap	291.4	196.8	99.2	97.0

in % of GDP (2007)

Source: Own calculations.

Finally, we want to illustrate the age- and gender-specific reform-induced burdens. From figure 3 we can see that among the living generations men are burdened when the sex-specific indexation instead of the average indexation is implemented. This holds for the standard as well as for the upper bound scenario. Should the lower bound scenario apply, men would be better off with a sex-specific indexing policy. Note that this is especially true for young males: the younger the living males the bigger the magnitude of this effect. Considering all living females, exactly the opposite results hold: women are better off with a sex-specific indexation policy, not only in the standard scenario but particularly in the upper bound scenario. However, in the lower bound scenario they are burdened by the sex-specific indexing and would thus be better off with an average indexing of pension benefits.

Figure 3: Age- and gender-specific reform-induced burdens (annuity)
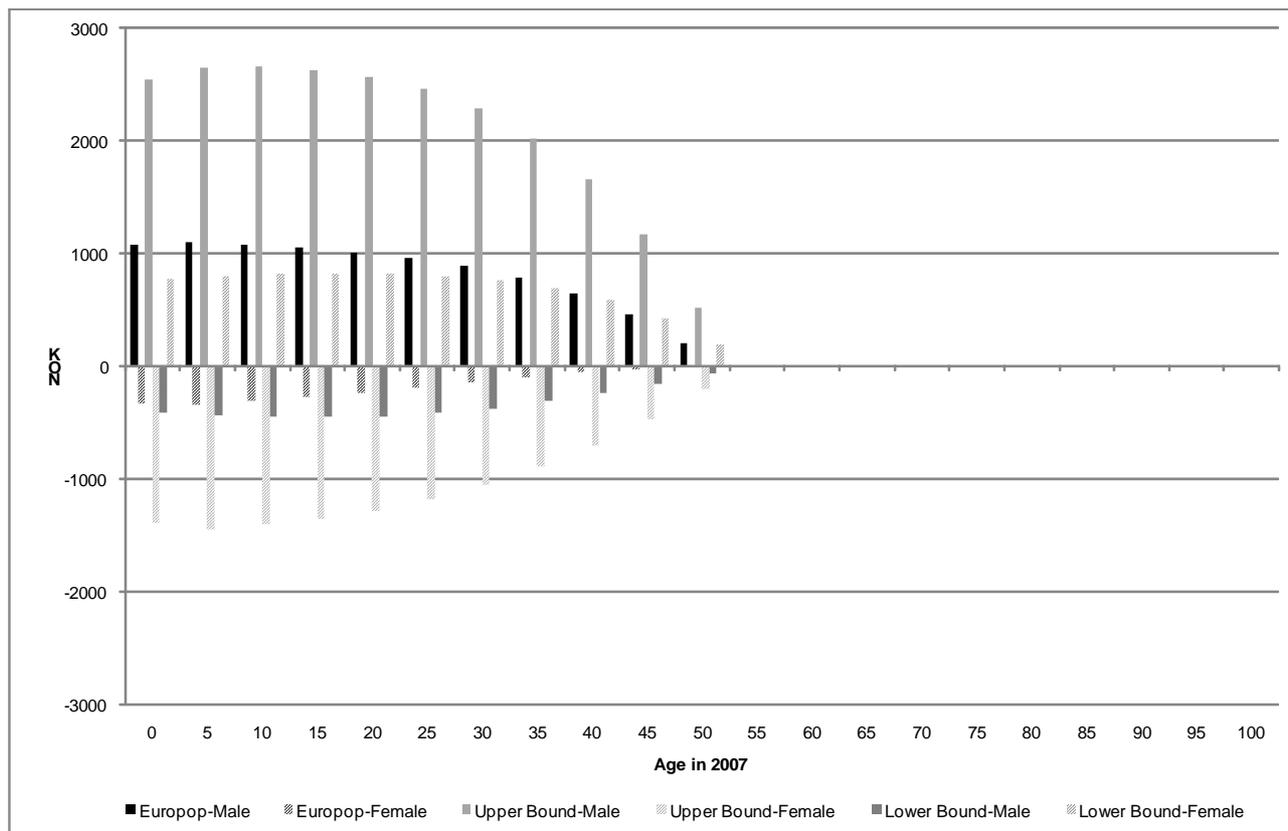
Source: Own calculations.

4. Summary and Conclusion

Norway is expected to face relatively strong pressure on its public finances due to an ageing population and the resulting increase in age-related public expenditure. Nevertheless, with the pension reform enacted in 2010 Norway will take a broad step towards long term fiscal sustainability. Due to life expectancy adjustment in benefits the pension scheme expenditure will in practice remain unaffected by the increased longevity. This is undoubtedly an effective way to retain fiscal sustainability. What we want to point out to, however, is that the intended intergenerational redistribution triggers intragenerational redistribution which is a mere side-effect of .the intergenerational redistribution. In the framework of this paper we quantified these effects (as well as the intergenerational redistribution effects) to show the magnitude of this unintended redistribution. We illustrated that the average indexation is beneficial for that group that has bigger relative gains in life expectancy. The group with the lower relative gain would on the contrary be better off with a sex-specific indexation rule. This is due to the fact, that the indexation rule is linked to cuts in generosity and a higher gain means bigger cuts in benefits.

Being well aware of our result's small magnitude and the fact that there are numerous redistributive flows in the Norwegian pension scheme, we nevertheless question the reform

element of average indexing. While it is well justifiable that there is income redistribution in the pension system it is less clear why further redistribution via average indexing is needed – especially as this is an effect which does not have to occur as gender and cohort discrimination could easily be implemented into the pension formula. With respect to the intention of implementing more actuarial elements it is not only advisable to do this in regard to gender specific longevity in the pension system but also in order to avoid further redistributive flows.

Considering relative gains in life expectancy one can come to unpopular conclusions. Before the pension reform, groups with a low life expectancy, as e.g. male bus drivers, were partly financing groups with high life expectancy. After the pension reform, one can now assume that male bus drivers *and* female lawyers finance groups with the biggest expected increase in life expectancy, as e.g. male lawyers.

References

Auerbach, A., J. Gokhale and L. Kotlikoff (1991), Generational Accounts: a meaningful alternative to deficit accounting, Tax policy and the economy, 5, 55-110.

Auerbach, A., J. Gokhale and L. Kotlikoff (1992), Generational Accounting: A new approach to understand the effects of fiscal policy on saving, Scandinavian Journal of Economics, 94, 303-318.

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.

Disney, R. (1999): OECD Public Pension Programmes in Crisis: An evaluation of the reform options. World Bank SP Discussion Paper 9921. Washington, D.C.

Fichtner, F. and C. Hagist (2008): Oil and intergenerational redistribution – the case of Norway, Diskussionsbeiträge des Forschungszentrums Generationenverträge, 32, Freiburg.

Fredriksen, D., K. Massey Heide, E. Holmøy and I. Foldøy Solli (2007): Macroeconomic effects of proposed pension reforms in Norway, in: Gupta, A. and A. Harding (eds.): Modelling our future: population ageing, health and aged care. Amsterdam: Elsevier, 107 – 142.

Holmøy, E. and K. Stensnes (2008): Will the Norwegian pension reform reach its goals? An integrated micro-macro assessment. Discussion Papers No. 557, Statistics Norway.

OECD (2007a): Life-expectancy links – The quiet revolution in pension policy. Paris.

OECD (2007b): Pensions at a glance: Public policies across OECD countries. Paris.

Ministry of Finance (2009), The government pension fund. http://www.regjeringen.no/en/dep/fin/Selected-topics/The-Government-Pension-Fund, 03.08.2009.

Ministry of Labour and Social Inclusion (2009): Governmental White Paper No. 5 (2006-2007). http://www.regjeringen.no/en/dep/aid/Topics/pensions, 18.05.2009.

Risku, I. and M. Vidlund (2008): Finnish and Norwegian pension reform: Implications for preparing aged society. Finnish Centre for Pensions Working Papers No. 4.

Stensnes, K. (2007): Equity versus efficiency in public pension schemes: Microsimulating the trade-off. Discussion Papers No. 515, Statistics Norway.

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