

PRACTICAL USE OF GENERATIONAL ACCOUNTING

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1 Introduction¹

Generational accounts were first calculated and presented for Norway in 1993. As issues of intergenerational redistribution even then were high on the political agenda, a presentation was soon included in the National Budget. At the same time, the US National Budget included a separate chapter on generational accounts (see chapter 26, US Budget 1993 or chapter 3, US Budget 1995), but ceased to include such analyses after a few years (for more on this, see CBO (1995)).

The aim of this paper is to briefly describe some of the issues that have been important in the presentation of generational accounting in the Norwegian National Budget and other official publications. It assumes that the reader is familiar with the technical basics of generational accounting, as described in Auerbach, Kotlikoff and Leibfritz (1999).

The paper starts with an overview of public finances in Norway in section 2. Section 3 comprises an overview of results and special issues related to the Norwegian generational accounts, while section 4 takes a closer look at the development of the accounts from 1995 to 2000,

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¹ The views expressed are the personal responsibility of the author and do not necessarily reflect the views of the Ministry.

especially with regard to business cycle effects. In section 4, important aspects of sensitivity regarding long run growth and discount rate assumptions are discussed. In section 5, the Norwegian accounts are compared to similar accounts for a number of EU countries and section 6 covers the role of generational accounting in the main planning documents for long term public finances in Norway.

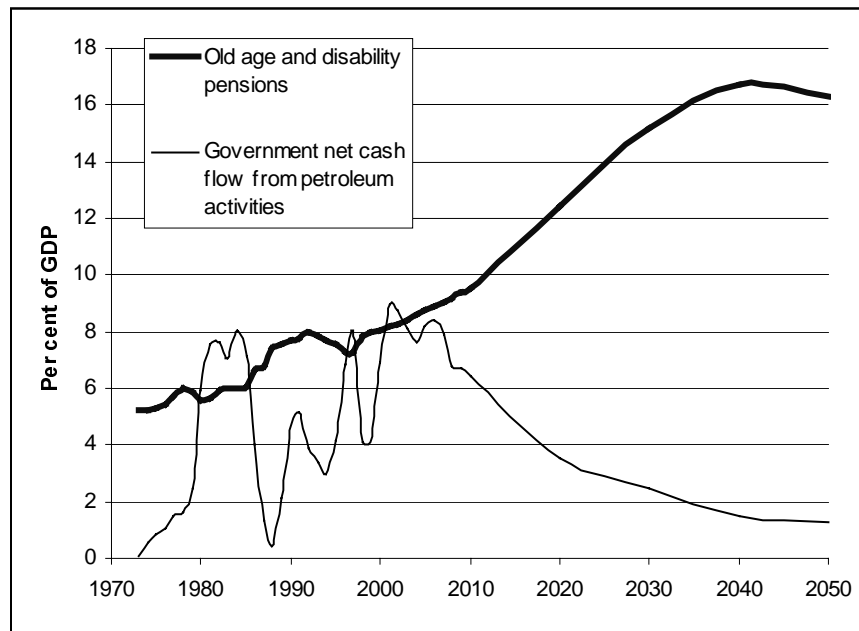
2 Background

Norway is a small, non-EU country with a GDP per capita among the highest in the world. The current population is around 4.5 million, and with birth-rates around 1.8 and positive net immigration, the population is projected to roughly stabilise at that level over the next 50 years. Population ageing will take place, and the ratio of people aged 60 or over to those aged 20-59 will grow from 0.37 in 1995 to 0.44 in 2015 and on to 0.59 per cent in 2035. Similarly measured, the share of those aged 75 or more - the oldest old - will increase from 0.13 in 1995 to 0.23 in 2025 and on to 0.26 in 2035. While strong, this pattern of ageing is not as severe as in many other countries.

The ageing population combined with a still maturing pension system, will lead to long term pressures on our welfare system, as in most OECD countries. Central government expenditure on the National Insurance Scheme's old-age and disability pensions is estimated to increase from about 8 per cent of GDP in 2000 to a good 16 per cent of GDP in 2050. At the same time, the growth in the number of oldest old will require increased resources for nursing and care services.

When evaluating the future challenges to fiscal policy in Norway, it must be taken into account that our public finances differ rather markedly from most other countries. Substantial petroleum revenues imply that Norway is in a better position than most other countries to address the challenges associated with an ageing population. Still, petroleum revenues are set to reach a top in a few years time, and after that they will fall gradually. The expected paths of public pensions and oil revenues are illustrated in figure 1.

Another feature of public finances in Norway that is perhaps just as remarkable as the oil revenues, is a very long tradition of fiscal prudence. In fact, during the last half century we've only experienced

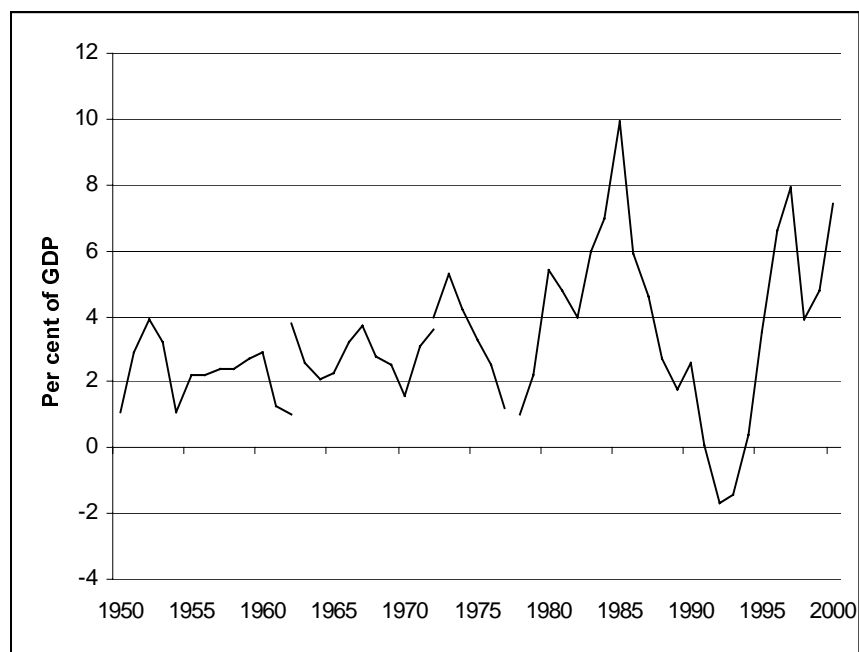
Fig. 1. Long-term features that influence public finances

Sources: Statistics Norway and Ministry of Finance.

deficit in the public accounts on one occasion (which was the down-turn in 1992-93, combining an international downturn with a national banking crisis.) The general government surplus for 1995-2000 is illustrated in figure 2.

Public net financial assets were estimated at 47 per cent of GDP by the end of 2000, as measured by the Maastricht criteria. In addition, the present value of the central government's expected future net cash flow from the petroleum activities is estimated at 130 per cent of GDP.

It's pretty hard to ascribe this history of surpluses to the oil revenues alone, as this situation obtained both before oil was discovered and during the long phase of public investments and negative cash flow from petroleum during the 1970's, a phase when debt financing could have been substantiated by high expected future revenues. Even during the periods when other European countries were piling up public debt, the public sector in Norway was accumulating assets.

Fig. 2 General government surplus 1950-2000

Note: The breaks in the figure represents breaks in the series.

Sources: Statistics Norway and Ministry of Finance.

Still, a growing use of early retirement schemes may contribute to the increasing dependency burden. The formal pension age in the National Insurance Scheme is 67. The actual average retirement age, however, is considerably lower, and while labour force participation among older age groups has fallen substantially the last few decades, it still much higher than in most other countries.

As a result of increasing expenditure on old-age and disability pensions while revenues from petroleum activities declines, fiscal policy will be facing considerable challenges in the long term. In periods of high petroleum revenues it would therefore seem necessary to set aside considerable capital in order to avoid a severe tightening of general government budgets later on.

3 Generational accounting in Norway

Generational accounting is by now well known in both the literature and in politics. A comprehensive presentation of both the methodology of such accounts and a wide range of applications can be found in Auerbach, Kotlikoff and Leibfritz (1999).

The first results for Norway were presented during a conference at the Norwegian School of Economics and Business Administration in 1993 (Auerbach et al., 1993), a few weeks before the general election to Parliament. As in a number of other early presentations of generational accounts, these first results were summed up as percentages—how much more will future generations have to pay in net taxes as compared to current generations? The calculations took 1992 as base year, and showed a substantial generational imbalance. The answer in our first accounts were around 130 per cent higher net lifetime taxes for future generations. These results provoked political concern and debate. The Minister of Finance decided that a discussion of intergenerational issues and generational accounts should be included in the next National Budget.

The annual budget documents in most countries consist of the Fiscal Budget, with the actual budget numbers, and a National Budget, which comprises analysis of selected issues. Early on, the Norwegian Finance Ministry had to decide its aims with respect to presenting results from the generational accounting exercise. The National Budget for 1995, which was presented in 1994, included a short main text and an appendix on the methodology. It was pointed out that a lot of numbers can be derived from such exercises. Presenting a lot of alternatives will typically be confusing in the political debate, so the Ministry was looking for one or a few central informative concepts.

In the growing literature on generational accounting, quite a number of such concepts have been introduced. As already mentioned, the ratio of the accounts of newborn to accounts of net yet born children was focused in the first papers. This ratio meets obvious problems when the denominator approaches zero or if the denominator and numerator have opposite signs. Recently, Raffelhüschen (1999) pointed out that the generational imbalance can be translated into a "true debt", or intertemporal public liabilities. The true debt is the sum of the explicit debt and implicit liabilities embedded in existing fiscal policies.

The Ministry wanted a number that was directly related to the budget itself, and focussed not on the imbalance but on measurements of the change necessary to achieve generational equality. Some numbers with this property are the required increase in taxes or reduction in transfers, or the required reduction in general government consumption. The first two alternatives are typically hard to reconcile with change - e.g. because of the progressive structure of income taxes, increased revenues from changes in taxation rules will usually imply changes in the age-specific profile as well. This is of course because changes are marginal while profiles express averages. The one number that was used in the presentations, is the required reduction in general government consumption that is necessary to restore balance between generations. This variable can be related directly to the surplus (deficit).

There are some special items in the Norwegian accounts. The most important such item is public petroleum revenues, which differs from other revenues as they are the result of extraction of non-renewable or depletable natural resources. Quite a lot about the future petroleum revenues are known, especially that they are expected to fall early in the next century. This temporary nature of the government's petroleum revenues can be handled by including an estimate of the net present value of future expected revenues in the government's budget constraint. This is illustrated further in Steigum and Gjersem (1999). Non-renewable resources should thus be viewed as equal to financial wealth. There are still issues related to the handling of uncertainty in this context which need to be clarified and quantified.

However, the results from the generational accounting exercise are very sensitive to assumptions regarding economic growth and discounting - especially since the Norwegian government from the outset has substantial positive net financial assets. A natural way to handle this is to express the result as an interval. This approach demands a choice of parameter(s) to vary and a determination of upper and lower parameter values. This is the approach of the National Budget, where the interval is based on a discount rate of 4 per cent and annual wage growth between 0.75 per cent and 1.25 per cent.

Updated calculations of generational accounts based on the Government's budget proposal for 2000 now indicate that the budget balance for the general government sector should, on a sustained basis, have been in the order of NOK 5-20 billion (0.3-1.6 per cent of GDP)

higher in 2000 in order to avoid a higher tax burden for future generations. This generational balance is corrected for items that are not determined by active policy measures (i.e., business cycle effects), as described in section 4. This cyclical correction aims at correcting the budget balance for the impact of automatic stabilisers, giving a "normal" or structural budget surplus. The adjustment is currently estimated at 0.7 per cent of GDP for 2000, implying that on a non-adjusted basis the interval would have spanned zero.

The accounts, as presented in public documents, are based on projections of public expenditure and revenues from a base year, allowing for extension of those projections as new budgets are published without changing the base year. The stability of such profiles over time is questionable, but repeated estimation since 1992 has not changed them very much. Other sources of uncertainty are probably more important. Note that the reduction in public consumption that is necessary to achieve generational balance is calculated for the budget year, and not for the base year. While being the obvious way to do it in this contexts, most papers on generational accounting use the base year.

In the future, the presentation process will probably follow the existing cycle of public planning documents in Norway. This process is based on a Long Term Programme, presented to the Storting in spring every four years, before the Parliamentary election the following autumn.² It is a comprehensive report outlining the Government's political visions, targets and policies for the following four year period focusing on long term structural issues. It also gives information about and analysis of economic and other Social issues and draws up perspectives for the development beyond the four year period, as a basis for the general political debate. The Long Term Programme is based in the Ministry of Finance, and a number of models are used in preparing the analyses included. Generational accounting will be updated and

² In fact, the Long Term Programme is a remnant of the so-called Marshall Aid given from the US to most European countries after the second world war. A prerequisite for receiving such aid, was that the country in question produced comprehensive plans for the transfer. These plans, or Programmes, has been a useful regular tools in the fiscal planning process and have survived up to now.

presented in the next Long Term Programme, scheduled to be presented in 2001.

Together with the Fiscal Budget, the National Budget is presented to Parliament every autumn. The National Budget gives a broad presentation of economic policy and the economic development both internationally and domestically. It provides the basis for concrete decisions on economic policy in Government and Parliament. As part of long term financial challenges, generational accounts based on projections from the base year to the current budget has been presented regularly in the National Budget. The accounts will then be based on the same base year between Long Term Programmes, reducing the number of changes between presentations. Larger changes or advances will probably be implemented in the Long Term Programme.

Defining generational balance as equalisation of net lifetime taxes adjusted for growth, as is done in generational accounting, has been discussed in the public debate in Norway. An alternative definition specifying only that consumption possibilities for later generations should be at least as high as for today's generations, would give very different conclusions. This sort of debate contributed to an understanding of the value of contemplating long term consequences of today's decisions, where generational accounting is a tool.

Already in the National Budget for 1995, it was pointed out that the results for Norway varies, depending on the initial economic situation and the assumptions on growth and discount rates. Hence policy recommendations will easily be ambiguous. Applied and presented with care and caution the generational accounting framework still is a valuable, pedagogic tool with intuitive appeal to the general public. It illustrates the need for budget discipline now to avoid hardship on future generations.

4 Business cycle effects

After the first broad presentation, the accounts were presented in the following Revised Budget and in the next budgets. Some issues soon appeared as the accounts were updated on a regular basis. Note the process of continuous updating is very much different from establishing generational accounts based on NIPA-figures at one occasion. A new

National Budget is presented in October, a Revised Budget with slightly new figures follows in May, and in addition the older Budget figures has to be replaced by National Accounts figures after a while.

As a small open welfare state, Norway tends to experience strong business cycles. As it turned out, the introduction of generational accounts in Norway coincided with a the strong downturn in the economy. In a few years the automatic stabilisers secured increased revenues and reduced expenditures. It is quite obvious that generational accounting, based on a single year, in a downturn will be very negative and similarly during an upturn will exaggerate the positive prospects.

Adjustments for this could be based on estimating a trend through time series of budget items, perhaps by using a Hodrick-Prescott-filter. Currently, the Norwegian generational accounting framework is not explicitly used for such adjustments. The Finance Ministry instead extracts information on the business cycle from other models used for budget work in the Ministry. Also, instead of using “corrected” estimates for separate items in the generational accounts, the estimated imbalance measured by the change in government consumption is compared to the total activity adjustment in the budget.

There are reasons for using more information than just a time series of budget figures, as the relationship between the budget balance and the cyclical situation of the economy can be decomposed into changes in fiscal policy and changes in the economy:

- The discretionary changes are the effect of changes in the fiscal policy.
- The induced changes are changes that arise as a consequence of changes in the economy; these are the changes that would take place even if fiscal policy were constant.

When the rules for some item in the budget is changed, for example income tax rules, there is one effect from the tax rule, and one effect from the economy -- and quite probably there are also effects from changes in the incentives that the economic agents are facing. As the Ministry already analyses these effects through other models, it is natural to exploit this knowledge. These models may be microsimulation models for tax policy or econometric models for business cycle effects. The discretionary change in fiscal policy should be included as an indicator

for the direction in which fiscal policy is heading, but the cyclical effects should be eliminated.

There are even more reasons for doing this. These other models are used for generating the underlying budget figures, so the generational accounts will in fact still be consistent with the budget when they are used. It is also a practical matter, as the Ministry need these estimates from the base model anyway. It is also a concern that the input figures for the accounts will arrive very late in the budgetary process, and that avoidance of multiple calculations is appreciated in such situations.

Table 1 below show recalculated results for base year 1995 with budget projections (accounts) up to every year to 2000. Recalculation means that information known in 2000 has replaced what was known at the time the budget was prepared. An example is that the net present value of public petroleum revenues as estimated in for the National Budget 2000 has been used throughout the experiments. The table also includes the measure for business cycle adjustment. A positive value indicates that revenues are higher and expenditure are lower that the Ministry believes to be sustainable in the long run.

Based on the 1995 budget, there seemed to be a large generational deficit upon presentation in 1994. Later, the general government accounts for 1995 turned out somewhat better than the budget. This was, among other things, due to reduced unemployment. In fact, recalculation of generational accounts for 1995 based on what is now known regarding both the general government accounts and public wealth, shows that the accounts for base year 1995 alone are close to balance, as corrected for business cycles.

During the following year, the estimated balance in fact turned slightly in favour of future generations, but at the same time the activity adjustment rose as real GDP growth turned out at 4.9 per cent in 1996 and 4.3 per cent in 1997. The total effect was for the required change in government consumption to equal 0.5 per cent of GDP in 1996 and 0.3 per cent in 1997 to achieve generational balance.

In 1998, public expenditure and transfers rose after a change of Government. Total public expenditure rose from 44.2 per cent of GDP in 1997 to 46.5 per cent. Among other things, a special cash transfer to parents staying at home with their children (on top of the general family

benefit) and a generous increase in the base pension was introduced. At the same time real GDP growth was halved to 2.1 per cent, and the required reduction in government consumption increased to 1.7 per cent of GDP.

In 1999, real GDP growth turned out at just 0.9 per cent, and the required reduction in government consumption grew. Also, as capacity utilisation stayed high and unemployment low, the business cycle adjustment stayed rather high. For 2000, the generational balance without adjustment was projected to be slightly better than in 1999, but as the business cycle adjustment remained rather high the required reduction in government consumption still turned out to be 1.1 per cent of GDP. This is the mid-point of the interval described in section 3.

Almost every year since 1995, estimates for public oil revenues have changed as prices vary and extraction plans change. The business cycle adjustment was introduced on a partial basis (central government only) in presentation of generational accounting in the National Budget for 1999. In the National Budget for 2000, the business cycle adjustment was extended to local government. There have also been other modifications, for example updated population projections. While the presentations have included descriptions of the changes, the results presented in the annual budgets must be said to be hard to compare.

Table 1. Generational accounting. Base year 1995 with projections
(per cent of GDP. Base assumptions*)

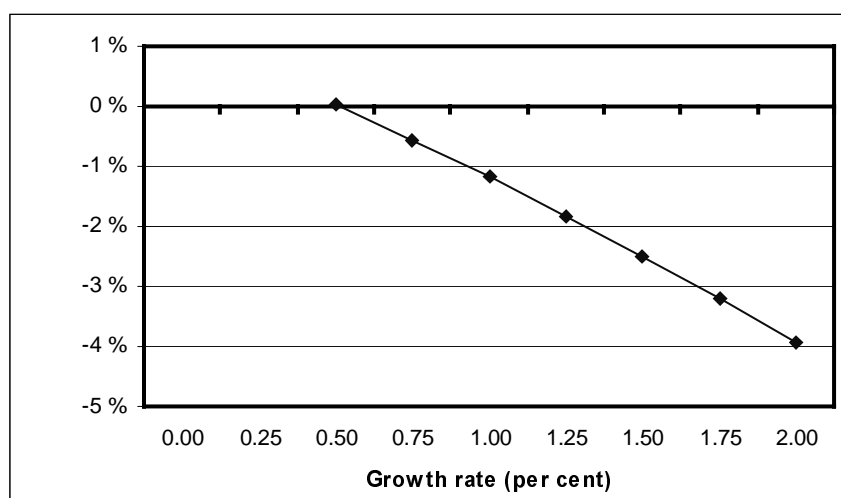
| | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
|--|------|------|------|------|------|------|
| | | | | | | 0 |
| Required reduction in gov't consumption | 0.6 | -0.1 | -0.8 | -0.2 | 0.6 | 0.4 |
| Business cycle adjustment | -0.7 | 0.6 | 1.1 | 1.9 | 1.3 | 0.7 |
| Required reduction in gov't consumption incl. adjustment | -0.1 | 0.5 | 0.3 | 1.7 | 1.8 | 1.1 |

* Base assumptions consists of annual real wage growth of 1 per cent and discount rate of 4 per cent.
Source: Ministry of Finance, Norway.

5 Sensitivity

A remaining problem is the sensitivity to discount rate and growth assumptions. In the first paper on generational accounting by Auerbach, Gokhale and Kotlikoff (1991), a growth rate of 0.75 per cent and a discount rate of 6 per cent was the "base case". For Norway, Auerbach et al. (1992) also used 0.75 per cent as growth rate but 4 per cent as discount rate. Recently, Raffelhüschen (1999) presented results for a number of countries in the EU. He focussed on 5 per cent discount rate and 1.5 per cent wage growth. Auerbach and Oreopoulos recently presented a paper on immigration and generational accounting, focusing on 6 per cent discount rate and a long-term growth rate of 1.2 per cent. No doubt, an even wider span is to be found in assumptions if one starts looking.

Fig. 3. Required change in government consumption to attain intergenerational balance. Sensitivity to real wage growth rate



In 1994, it was decided to use approximately the same assumptions that were used in the first presentation for Norway. A separate argument was that they were also more or less in line with

similar assumptions used for other purposes in public planning. As described in section 3, the presentation in the National Budget is based on 4 per cent discount rate and wage growth between 0.75 and 1.25 per cent. Figure 3 illustrates results for varying rates of wage growth (after correcting for business cycle effects).

First of all, it should be pointed out that this is a somewhat different line than most other countries would get if they made similar exercises in their own accounts. In fact, the existence of large public net financial assets means that higher growth increases the "generational deficit", as future taxes and transfers grow while existing wealth stays the same. With debt, you would experience the opposite effects as existing debt are reduced relative to future transfers. This is the same sort of argument that leads to the ability to "grow out of debt", which is a altogether better situation than to grow out of assets.

The curve is quite steep, reflecting that small changes in assumptions would change the results a lot. This situation means that it is strong policy recommendations on the generational accounts alone are not warranted.

Probably, the wage growth should be somewhat stronger to get more in line with other presentations. Also, the value of 1 per cent now is slightly lower than the long term growth as it is used in public other projections. Still, an increase from 1 to 1.5 per cent would mean that the required reduction in government consumption would double.

Regarding the discount rate, the opposite is true -- increasing the discount rate reduces the imbalance. In Steigum and Gjersem (1999) and in most of the papers in the Auerbach et al. (1999), a combination of growth of 1.5 per cent and a discount rate of 5 per cent. Compared to the results in Steigum and Gjersem (1999), where the change in spending to equalise burdens was estimated at 1.9 per cent of GDP based on government accounts in 1995 and at 0.95 percent of GDP based on a medium term projection, the estimated change in spending is now lower. The most comprehensive measure, that is, including the business cycle adjustment, shows that the change in spending in 2000 is now 0.6 per cent of GDP when the same assumptions are used. This reduction also reflects increases in estimated petroleum wealth since publication of the older paper.

Still, the calculation of generational accounts for Norway underscores that the expected high petroleum revenues the next few years should translate into considerable budget surpluses in order to secure generational balance and a long-term sustainable development path for the Norwegian economy. If we believe in the assumptions, our use of the accounts gives us an estimate of "how large" the annual surplus should be. The uncertainty associated with future petroleum revenues indicates, in isolation, that the budget balance should be strengthened further.

6 Norwegian accounts and other countries

In recent years it has become increasingly common internationally to present calculations of generational accounts, although international comparisons of generational accounts place considerable demands on uniform procedures and definitions. Both Auerbach, Kotlikoff and Leibfritz (1999) and Raffelhüschen (1999) are such examples.

Such comparisons call for comparable use of methods and assumptions. Of course, similar assumptions on discount rates and income growth should be used. The choice of common assumptions on growth for comparison is perhaps even harder than that experienced for one country, as different countries are experiencing different growth rates in income and productivity per labourer. Real interest rates also differ greatly among countries, at least outside the common currency area. The preferred assumptions have varied over time even among the leading practitioners of generational accounting, and as shown in section 5, this choice may influence results strongly, and also in different ways for different countries.

Cross section data, as used to calculate profiles in most countries, may not in all cases give the best estimates for future taxes and transfers. In Norway, a still maturing pension system is an example. New pensioners on average receive higher pensions than older pensioners, as the new pensioners have been earning pension rights for more years. In 2007, the first cohort with full earning opportunities will reach the retirement age. As a new pensioner still will receive a higher pension than the average pension as long as there are pensioners with shorter earnings periods left in the system, the cross section profiles must be extended. We do this by including information on future payments from a dynamic

micro-simulation model for pension analysis (see Fredriksen (1998) for a description of this model).

Similarly, female labour participation rates have increased all over the world for a long time. A general assumption is that current young women will have higher rates of participation as they grow older than their mothers. This implies that current female taxpayers will pay a larger share of future taxes than suggested by profiles based on cross sections. How much more will depend both on how much further participation rates will increase and on the level of labour income taxation. According to the latest surveys, the participation rate is currently approx. 10 percentage points lower among the female population aged from 20 to 66 years than among males. A further rise in female labour participation rates is not included in the Norwegian accounts.

The sorting of revenues and transfers into age- and sex-specific items and parts is mostly decided by the available data sources. Different countries have their own statistics, registers and surveys, resulting in differences among countries. The original question of who pays, may sometimes not be researched enough. An example is that for some countries, all revenues raised by value added taxes (VAT) are distributed according to profiles based on consumer expenditure surveys even though some of these revenues are paid by the public sector and VAT-exempted firms. This may be a question of book-keeping rules, but it may also be important for the final results.

In the last National Budget, a comparison of results from the Norwegian generational accounts with the accounts that have been established for 12 of the 15 EU countries during the past year were presented. With the exception of Ireland, all EU countries need to tighten public finances, although this varies substantially across countries, cf. Table 2. Of the Nordic EU members, Denmark's tightening requirement is less than that of Sweden and Finland, partly because the latter two countries are facing a more pronounced ageing of the population than Denmark's. The average tightening requirement for EU countries in the table corresponds to an increase in taxes of about 4.2 per cent of GDP.

The assumptions concerning growth and discount rates deviate slightly from corresponding assumptions generally used for Norway. If the Norwegian calculations are based on the same assumptions and base

year as those applied to the EU countries in Table 1 -- and the "business cycle correction" as described in section 4 is included, a problem the EU-study abstracts from -- , then the generational accounts for Norway show a tightening requirement in 1995 on the order of just 0.3 per cent of GDP.

Table 2. Generational accounting among EU-countries
(base year 1995)

| | Increase in all taxes necessary to restore balance (per cent of GDP) |
|-----------------|--|
| Ireland | -0.1 |
| Belgium | 0.6 |
| Denmark | 2.3 |
| The Netherlands | 2.5 |
| France | 2.6 |
| Italy | 4.0 |
| Germany | 4.7 |
| Spain | 5.1 |
| Great Britain | 6.0 |
| Austria | 6.5 |
| Sweden | 7.6 |
| Finland | 8.8 |
| Average in EU | 4.2 |
| Norway | 0.3 |

Sources: Raffelhüschen (1999) and Ministry of Finance, Norway.

7 Summing up

Presentation of results from generational accounting is now an integral part of public policy documents such as the annual National Budget in Norway. Since the first presentation, the combination of a significant economic upturn and increased petroleum revenues have improved the generational accounts, and currently the imbalance seems to be smaller in Norway than in most other countries. These changes can be attributed to changes in public wealth due to changes in petroleum revenues, which is a special effect for Norway, to business cycle effects, and to real changes in government consumption, taxes and transfers.

Also, one should note that there has been growing understanding and gradual introduction of adjustments for these elements. Still, The Norwegian accounts seems to be more sensitive to assumptions and probably to business cycles than similar accounts in other countries.

All of these elements have been important when presenting accounts in the annual National Budgets. As the presentations are closely related to the proposed budget, the Ministry has focused on the change in current government consumption that is necessary to achieve generational balance. There are a number of other measures that could be presented.

Why has the use of generational accounting already become a regular feature of Norwegian policy documents? First of all, Norway has different traditions than most other countries. Following the discovery of profitable petroleum resources in the North Sea in the late 1960s, a range of issues regarding wealth management, intertemporal distribution and stabilisation of economic activity were raised in public discussion. In particular, disentangling the revenues from the petroleum sector from current transfers and consumption of goods and services has become a main priority for the formulation of economic policy.

Secondly, long term planning and analysis are firmly established in Norway. In a recent OECD publication (OECD, 1999) it is pointed out that among 28 members, only three beside Norway has a regular report on the long term outlook (10-40 years) for public finances. Thirdly, the use of numerical economic models in policy formulation is well established in Norway. We have a long tradition for using long term macroeconomic models in such work, perhaps somewhat in contrast to the views presented on such applications in other countries (see CBS

(1995), where the role of long term projections in budget analysis somewhat surprisingly is rejected). Finally, the idea of intergenerational transfers has long been established in Norway, especially as it for a long time has been obvious that the special profile of our petroleum revenues may give rise to high consumption now.

This preoccupation with long term issues in fact gives rise to debates in Government and Parliament concerning problems that span the next 50 years. The Ministry of Finance tries to ensure that assumptions and projections used as basis for such debates are comprehensive and transparent. There is an ongoing debate regarding the need for further budget balance improvements, and while the generational accounting analyses have not as such provoked any “belt-tightening”, they have underlined the need for a prudent and far-sighted budget policy.

The Norwegian Government has presented *a broad strategy* to meet the future challenges of ageing and falling petroleum revenues. The main message in this strategy is to strengthen the economic fundament for future welfare by measures to promote a well functioning economy, high employment and sound public finances through a tight fiscal policy. The public assets are large, but only long term estimates will tell us whether they are large enough. Putting aside additional petroleum revenues in a “State Petroleum Fund” invested abroad is a main element in this policy. Generational accounting is one of several instrument telling us something about how large the current surpluses should be.

A coherent and simultaneous treatment of all budget items has for long been one of the key principles in the Norwegian public budget system. Taxes should not be earmarked for expenditures considered to be integral parts of public sector responsibility. This regards items such as Social Security spending, which is considered a prime example of such responsibility in Norway. By earmarking, it is difficult to give all budget items consistent and visible budgetary treatment over time, a requirement which is essential to ensure sustainability. If single elements are isolated from the ordinary budget process, less focus is put on the development of these expenditures and important information will be lost. The need to adjust tends to be recognised too late, which in turn makes more serious changes necessary. A coherent discussion in the Government and the Parliament of public income, expenditure and policy priorities during the annual budget process is essential.

As a result of increasing expenditure on old-age and disability pensions while revenues from petroleum activities declines, it is clear that fiscal policy will be facing considerable challenges in the long term. In the current period of high petroleum revenues it is necessary to set aside considerable capital in order to avoid a severe tightening of general government budgets later on. Formal economic models are needed to analyse the magnitude of future challenges and the policy changes needed today. Generational accounting applied and presented with care and caution is a valuable tool with intuitive appeal to the general public, and supplemented by other models it illustrates the need for budget discipline now to avoid hardship on future generations.

APPENDIX

**GENERATIONAL ACCOUNTS FOR NORWAY
(NATIONAL BUDGET 2000)**

| | | |
|---------------------|------------------------------------|-------------|
| <i>Assumptions:</i> | Base Year: | 1995 |
| | Discount Rate: | 4.0 |
| | Growth Rate: | 1.0 |
| | Population Projection: | M1_96 |
| | Aggregate File: | nb2000 |
| <i>Indicators:</i> | Explicit Debt (Percent of GDP): | -221.3 |
| | True Debt (percent of GDP) : | 21.7 |
| | Tax Change for Future Generations: | 4.5 Percent |

Generational Accounts

| | Average | Male | Female |
|---------------------|---------|--------|--------|
| Present Newborns | 277.2 | 892.4 | -375.8 |
| Future Newborns | 378.4 | 1012.1 | -293.8 |
| Absolute Difference | 101.1 | 119.6 | 82.1 |

Restoring Intergenerational Balance by immediate policy changes

I. Adjusting All Taxes

Immediate Tax Increase by 1.4 per cent (0.6 per cent of GDP)

| | Average | Male | Female |
|----------------------------|---------|-------|--------|
| GA Present/Future Newborns | 307.7 | 928.4 | -351.2 |

II. Adjusting all Transfers

Immediate Transfer Reduction by 1.6 per cent (0.4 per cent of GDP)

| | Average | Male | Female |
|----------------------------|---------|-------|--------|
| GA Present/Future Newborns | 308.5 | 920.4 | -341.0 |

III. Adjusting Budget Surplus/Deficit (via Government Consumption)

Government Consumption Reduction by 4.5 per cent (in 1995)
 equals 0.4 per cent of GDP
 equals 5.3 bn in 1995
 or 6.1 bn in 2000

IV. Cyclically Adjusted Budget

Government Consumption Reduction by 11.0 bn in 2000
 equals 1.1 per cent of GDP

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