Fiscal sustainability and fiscal policy targets

Torben M. Andersen

AARHUS
UNIVERSITY
BUSINESS AND SOCIAL SCIENCES
DEPARTMENT OF ECONOMICS AND BUSINESS

Fiscal sustainability and fiscal policy targets

Torben M. Andersen
Department of Economics and Business
Aarhus University

July 2012

Abstract:

Analyses of fiscal sustainability have become integral parts of fiscal policy planning due to high debt levels and projected demographic changes. A popular metric by which to evaluate sustainability gaps is the so-called S2 metric given as the permanent change in the primary budget balance (relative to GDP) needed to meet the intertemporal budget constraint. While a very useful metric it also suffers from some problems, and the paper discusses some of the problems with this metric as a way to assess fiscal sustainability problems. A particular important issue is the extent to which the S2 indicator can be given a normative interpretation, and this issue is extensively discussed. The paper ends by discussing the formulation of fiscal policy targets to ensure fiscal sustainability.

1.   Introduction

Demographic changes have raised the issue of long-run sustainability of pensions and welfare arrangements. In a number of countries these issues have been intensified by high debt levels partly due to failure to consolidate public finances in the past and partly as a result of the financial crisis. For these reasons medium- and long-run issues play a crucial role for the design of fiscal policies, and accordingly there has been a growing interest in developing methods by which to assess fiscal sustainability and to develop fiscal policy targets which can be used to ensure that short-term developments are in accordance with medium-/long-term objectives. Analyses of fiscal sustainability have thus become an integral part of economic policy planning, and most countries make assessments of fiscal sustainability. Such assessments are also part of the reporting EU countries make according to the Stability and Growth Pact.

Fiscal sustainability questions whether current policies are consistent with the intertemporal budget constraint. As such this does not take a stand on whether current policies are optimal, or whether it is desirable to maintain these policies, but rather asks whether it is feasible – if so desired – to maintain these policies.

The basic reason why the answer to this question is interesting is an underlying desire to avoid frequent changes in policies; i.e. a smoothing argument. If not the budget could be balanced period by period, and such a pay-as-you-go approach would not necessitate any forward-looking considerations. However, this would be undesirable due to a concern about policies varying over time and thus generations. Furthermore, a balanced budget would not allow the public sector to smooth and thus diversify shocks over time. Smoothing may be desirable for efficiency reasons (tax smoothing and insurance) or equity reasons (different generations should be treated equally). Clearly there can be different views on what should be smoothened, but when discussing policy responses it is important to clarify this. In the current situation the challenge for most countries is to consolidate public finances to ensure fiscal sustainability.

Several issues arise when making an analysis of fiscal sustainability. The foremost question is whether simple measures of sustainability problems can be derived in a form which is readily applied in a policy context. A useful metric should provide an assessment of the orders of magnitude involved and be useful in working out policy strategies to ensure fiscal sustainability. Moreover this should translate into intermediary targets making it possible to plan and monitor policy developments so as to ensure that they are consistent with the policy strategy aiming at fiscal sustainability.

This is riddled with difficulties. First, fiscal sustainability is forward-looking question involving an identification of key factors influencing future developments. A difficult task associated with uncertainties. Second, the issue of fiscal sustainability invariably involves questions related to intergenerational distribution and risk-sharing. It is often phrased as "leaving future generations with the same options as current generations", but this is not easy to make operational. The notion

of generational balance or fairness is far from obvious, and hence the policy inferences to be made are not always straightforward. Thirdly, there is the issue of the concept of sustainability. Sustainability in the broad sense would include the natural resources, the environment, human and real capital etc. The focus in assessments of fiscal sustainability analyses is much narrower in the sense of considering fiscal policy separately[1]. Finally, there is a difficult transition from relatively abstract notions of fiscal sustainability to the determination of useful intermediary targets for fiscal policy.

This paper discusses issues on how to identify and measure problems of fiscal sustainability and how to make them operational. The main focus is on the so-called S2 indicator, which is widely used, and which summarizes policy requirements to ensure fiscal sustainability in the permanent change in the primary budget balance relative to GDP. This measure gives the needed permanent change to ensure that the intertemporal budget constraint of the public sector is met. While the S2 measure is relatively simple conceptually, neither the computation nor the interpretation of this metric is simple. These issues are discussed (Section 2), and the question of how to go from a positive metric of sustainability problems to a normative determination of strategies is discussed (Section 3). The paper also discusses (Section 4) how to set intermediary targets for fiscal policy so as to support the underlying strategy to ensure fiscal sustainability. Section 5 concludes the paper.

2.   *Assessing fiscal sustainability – the positive part*

The basis for an analysis of fiscal sustainability is a projection of the path for public expenditures and revenues. A key reason for such an analysis is the concern that approaching demographic changes bring public finances on an unsustainable path. For such an analysis the starting point is some interpretation or characterisation of current policies which in combination with a population forecast is used to assess how public finances will develop. Identification of eventual sustainability problems is a crucial input to policy debates. However, such analyses can also be used to address the consequences of other policy issues like increasing demand for public services (health services)[2] or the consequences of a trend decline in working hours etc. Such analyses are increasingly made, and they serve the purpose of identifying and quantifying challenges for policies in due time to make a political prioritization possible. In the same vein it is possible to assess the effects of reforms (e.g. pensions and retirement reforms) for fiscal sustainability.

An assessment of fiscal sustainability proceeds from the initial net-debt position and trajectories for expenditures and revenues under given policies and asks whether the intertemporal budget constraint of the government is met. Solvency is thus always ensured, but the debt level need not

---

[1] Even that is not without problems since public investment and consumption differ in their future implications, cf. discussion about Golden Rule Budget regulations (see e.g. Blanchard and Giavazzi (2004)), and even items like education and health usually classified as current public consumption have implications for future welfare and thus intergenerational distribution.

[2] When the boundaries in health care are being continuously shifted outwards by progress in life sciences, the financial implications of maintaining up-to-date welfare services may be dire (see e.g. OECD (2006)).

be constant, provided the needed adjustment to ensure sustainability is made (see below). There are two important points to consider when interpreting such analyses. First, they do not constitute a forecast of the most likely development far into the future, but give a planning tool useful in assessing current policies taking into account both backward-looking elements captured in the initial net debt level and forward-looking elements including e.g. changing demographic structures. This is an indispensable input for policy formation. A primary purpose is thus to provide a better information base on which to make political decisions of a structural character. Second, an identification of a sustainability problem can not necessarily be interpreted as a solvency problem in the strict sense, but rather it is a signal that policies will have to be changed at some point in time to avoid that solvency problems arise. In the following we consider situations where there is no imminent solvency problem.

Methods

The standard approach when assessing fiscal sustainability is an extrapolation method to project future public expenditures and revenues. The main steps are to make a decomposition of expenditures and revenues on demographic characteristics of the population in a given base year, and combine this with a population forecast to generate paths for future public sector expenditures and revenues[3]. The basic assumption underlying this approach is that the relevant socio-economic frequencies in the base year remain invariant over the projection period; e.g. share of people in a given demographic group utilizing a given public service remains unchanged. This is interpreted as capturing unchanged behaviour and policies. In addition assumptions on costs (wage) and productivity developments are made to arrive at an assessment of the financial consequences. The degree of detail in such analyses clearly depends on the extent to which expenditures and revenues are disaggregated based on various demographic characteristics (age, sex, country of origin etc.). The basic outcome of such an analysis is a path for public expenditures and revenues and thus the budget balance, and this can be summarized in various indicators, cf. below.

More recently explicit intertemporal general equilibrium models have been used to assess fiscal sustainability issues. This approach has the advantage that key mechanisms are endogenized, and individual behaviour is consistent with intertemporal budget constraints. Such models are basically large-scale calibrated overlapping generation models, see e.g. the DREAM model for Denmark (DREAM (2010)) and the GAMMA model for the Netherlands (Draper and Armstrong (2007))[4]. However, this is still an area in development, and few such models exist. Given the importance of the issue of fiscal sustainability, it may be worth noting an asymmetry in model-developments between monetary and fiscal policies. While there has been extensive research on monetary models and developments of DSGE models for monetary policy analysis, much less resources have been devoted to model development for fiscal policy purposes. As noted above most assessments of

---

[3] Not all expenditures and revenues can be decomposed in this way, e.g defence expenditures, and such components are usually assumed to have an unchanged share relative to GDP.
[4] The use of an explicit intertemporal model raises a particular problem since the intertemporal budget constraint is an integral part of the model. This rules out fiscal sustainability problems in a literal use of the model. A technical solution to this is to allow e.g. an exogenous transfer from abroad to ensure fiscal sustainability.

fiscal sustainability are based on the extrapolation method, and the use of explicit general equilibrium models is the exception rather than the rule. Given the significant importance of fiscal policy, this is a serious shortcoming.

The extrapolation method has the advantage that it is fairly simple and easy to apply. However, the path generated may be difficult to interpret since it does not allow endogenous responses. A potential serious problem of the extrapolation method is that it relies on an underlying path for the economic development which may not be feasible and which disregards important adjustment mechanisms[5]. This may bias the assessment of fiscal sustainability in an unknown direction[6].

The main advantage of an explicit general equilibrium approach is that such inconsistencies are eliminated. The general equilibrium model is much more demanding and requires more detailed modelling; it is thus more resource consuming. Clearly such models rely on a number of assumptions, but the extrapolation method also relies on assumptions which are often implicit, and the general equilibrium approach has the advantage that they are made explicit and thus can be discussed more easily. In addition the scope for considering alternative scenarios and doing analyses is larger in an explicit model.

Figure 1: Projected path for primary budget balance, Denmark
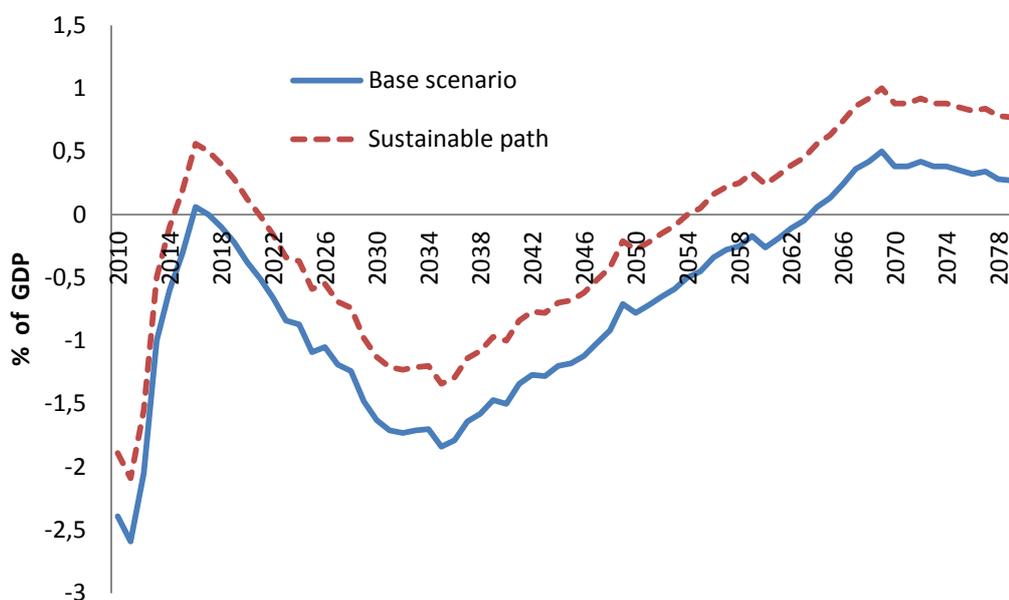
Source: Danish Economic Council (2011).

---

[5] This includes changes in e.g. the savings ratio when the population structure changes. In the method used by the Ministry of Finance in Sweden, the trade balance is a residual, and hence the trajectory may imply an implausible path for net-wealth, cf. Swedish Fiscal Policy Council (2011).

[6] It should be noted that in terms of generating a basic path for public finances and thus an assessment of fiscal sustainability for unchanged policies, the outcomes of the two methods may not differ that much. However, in terms of analyzing policy responses to fiscal sustainability problems, the general equilibrium model is much more useful, while the extrapolation method is highly problematic in this respect.

The basic output: Trajectories for expenditures, revenues and public balance

An analysis of fiscal sustainability is basically a projection of the path for public expenditures and revenues for given policies. An example of such an output is given in figure 1 for Denmark. The primary balance is currently in deficit due to the financial crisis, but will approach balance within 4-5 years. After that there will be systematic deficit for five decades, followed by surpluses in the far future[7].

Two questions arise in relation to the projection in figure 1. First, is this trajectory sustainable in the sense that the intertemporal budget constraint for the public sector will be satisfied?[8]. If so, maintaining current policies is financially viable. This is a feasibility test, but it does not address the question whether current policies are optimal or have some desirable properties worth maintaining. Second, if the answer to the above question is negative, it is of interest to work out a simple metric capturing the orders of magnitude involved.

The S2 metric

It has become increasingly customary to summarize budget paths either in a measure of the fiscal gap or implicit debt level given as the difference between the present value of revenues and expenditures as a percentage of GDP[9], or the needed permanent budget change as a share of GDP to meet the intertemporal budget constraint, known as the S2 indicator[10]. The two indicators are basically giving the same information. The S2 indicator is the annuity with the same present value as the fiscal gap or implicit debt, and it is the most commonly used indicator. While an important metric, it is important to be aware of its properties and, in particular, its shortcomings when inferring policy implications from the metric.

To define the sustainability indicator, denote by b_t the primary budget balance (revenues less expenditures) measured relative to GDP and by r the growth-corrected real rate of return (for simplicity assumed constant). The debt level (measured relative to GDP) at the end of period t is denoted d_t, and hence $d_t = (1+r)d_{t-1} - b_t$. The indicator for sustainability of fiscal policy (S2) is defined as the permanent improvement in the budget balance relative to GDP, which given the initial debt level (d_{t-1}), the projected primary budget balances $(E_t b_{t+i}, i \geq 0)$ and the growth-corrected real rate of interest (r), ensures that the intertemporal budget constraint is exactly fulfilled. The sustainability indicator s is thus defined as the solution to

$$E_t \left[\sum_{i=0}^{\infty} (\frac{1}{1+r})^i b_{t+i} \right] + \sum_{i=0}^{\infty} (\frac{1}{1+r})^i S2_t = (1+r)d_{t-1} \qquad (1)$$

---

[7] One reason for the U-path is a reform increasing the statutory retirement age (early retirement, and public pensions) gradually which later will be indexed to life expectancy. The U-path follows since the phasing in does not keep pace with demographic changes, but in the long run it does catch up.

[8] Initial net debt is zero.

[9] This is also sometimes denoted the implicit financial net worth, see Swedish Fiscal Policy Council (2009, Appendix 1).

[10] This is the terminology introduced by the European Commission (see European Commission (2006)). The alternative (S1) is the requirement to ensure a debt level of 60 percent of GDP in 2050 (now 2060).

where E_t denotes the expectations operator conditional on period t information (hence the time subscript on the S2 variable). The sustainability indicator is thus defined so as to ensure that the present value of all future net revenues (left-hand side of (1)) at the end of period t equals the end-of-period t value of the initial debt (right-hand side of (1)).

The indicator $S2_t$ gives the estimate of the permanent change in the primary budget balance ensuring that the intertemporal budget constraint is exactly met based on period t information. If $S2_t > 0$, there is a sustainability problem since the primary budget balance must be permanently improved to ensure that the intertemporal budget constraint is met, and if $S2_t < 0$ there is no sustainability problem but room for expenditure increases or tax decreases.

The sustainability indicator can also be written as a weighted average of all future primary budget balances and the initial debt level can be transformed into an infinite annuity, i.e.

$$S2_t = -\sum_{i=0}^{\infty} v_i E_t b_{t+i} + \frac{r}{1+r} d_{t-1}$$

where $v_i = \frac{r}{1+r}\left(\frac{1}{1+r}\right)^i$, and $\sum_{i=0}^{\infty} v_i = 1$. An increase in the discount rate r thus twists the weights since

$$\frac{\partial v_i}{\partial r} < 0 \; for \; i > i^* \equiv \frac{1+r}{r}$$
$$\frac{\partial v_i}{\partial r} > 0 \; for \; i < i^* \equiv \frac{1+r}{r} \qquad (2)$$

The intuition is that a higher discount rate r decreases the present value of the primary budget balance in the far future, but at the same time it increases the annuity factor, and therefore the underlying budget profile is weighted differently when the interest rate changes (see below).

The logic of the S2 metric can be explained in terms of the Danish case, cf. figure 1. The projected profile is not fiscally sustainable, and S2 is computed to be 0.5% of GDP. Since S2 is the annuity or permanent change in the primary budget balance needed to meet the intertemporal budget constraint, this corresponds to a parallel upward movement of the budget profile equal to 0.5% of GDP. For the new profile (dotted lines in figure 1), fiscal sustainability is exactly met.

The result of a recent assessment of fiscal sustainability for EU countries from the European Commission (2010) is shown in figure 2. It is seen that there is substantial variation across EU countries and that the sustainability problem is significant for a number of countries. It should be noted that the European Commission uses a unified set of assumptions[11] which implies that the assessment differs from the country specific assessments.

---

[11] Among other things the Eurostat population forecast is used, gross debt rather than net debt is used, and the horizon is 2060.

Figure 2: Fiscal sustainability indicator S2 – European Commission Estimates
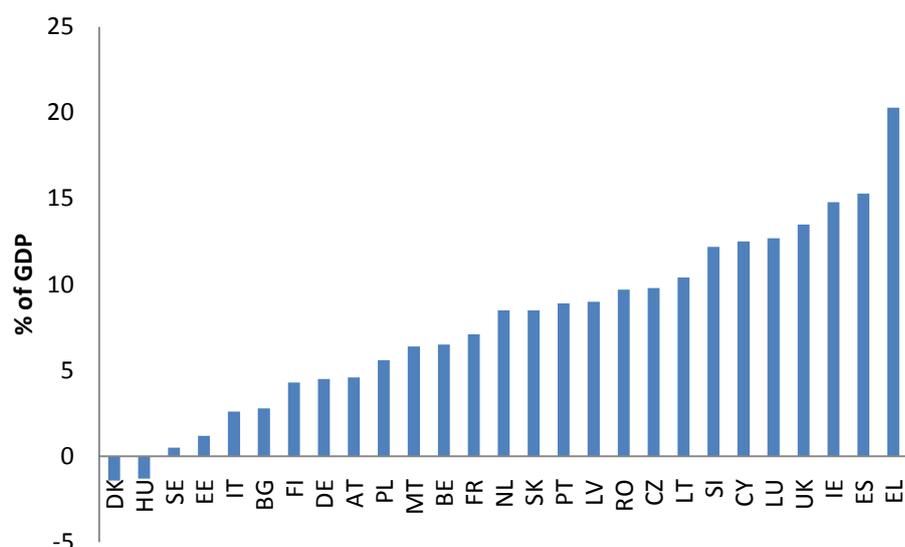
Source: European Commission (2010).

The European Commission uses also a so-called S1 indicator defined as the permanent budget change in % of GDP needed to ensure a debt to GDP ratio of 60% in 2060.

Finally it should be noted that the above is closely related to so-called generational accounting. General accounting also allows an assessment of fiscal sustainability, but in addition it allows an evaluation of intergenerational distribution issues, see e.g. Cardarelli et al. (2000), Deeg et al. (2009). By comparing the general accounts of current new-borns and the accounts of future new-borns, one derives a metric of generational balances[12]. If the lifetime net tax payments of future generations are larger than those for current new-borns, it can be concluded that current policies are generationally imbalanced in the sense that different generations are not treated equally. Moreover it can be concluded that current policies are not fiscally sustainable since net tax will have to be raised. There are various ways to measure these generational balances (see e.g. Cardarelli et al. (2000)). Since intergenerational distribution issues are important to the debate, and often invoked as an argument for given policies or strategies, such generational accounting analyses are very important.

Discounting

The choice of discount rate (growth corrected real rate of return) is crucial for the S2 indicator in a complicated way since the future primary balances are discounted and then translated into an annuity value, ensuring that the intertemporal budget constraint is met. This is reflected in (2) showing that primary balances in a given year have weights which in a non-linear way depend on

---

[12] This is conceptually different to the S2 indicator since it assumes that policy changes will affect all future generations only, whereas the S2 indicator is based on the principle that the effect takes place immediately and thus affects all living and future generations.

the discount rate. In addition a low discount rate implies that primary budget positions far into the future get a relatively large weight. These points are illustrated in figure 3. With a discount rate of 1 % (2%), the budget balance 100 years into the future gets half (one quarter) the weight of the current budget balance. The figure also shows that a lower discount rate increases the importance of the budget balance in the far future, and decreases the importance of the budget balance in the near future. With a nominal rate of interest of 5%, inflation of 2 % and 2 % productivity growth, the growth corrected discount rate becomes 1 %. For a discount rate of 1%, the first 100 years has a total weight of 63% in the S2 indicator, for a discount rate of 2 % the weight is 86%.

Figure 3: Period weights in the sustainability indicator for different discount rates
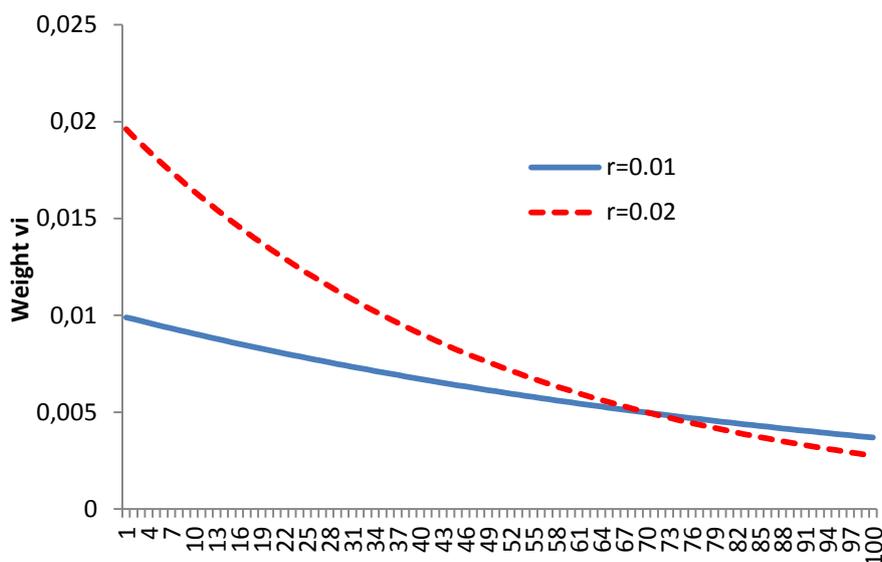
The horizon dilemma

A computation of the S2 indicator assumes an infinite horizon. In practice a path is generated about 100 years into the future (e.g. to the year 2100) after which the economy is supposed to be in a stationary state. To policy makers it may seem extreme to assume such a long horizon, and it is often interpreted as trying to engage in futile long-term projections where uncertain conditions in the very far future translate into requirements on current policies.

As a response to this it has been proposed to use a higher discount rate than the market rate, and thereby putting a lower weight on conditions in the far future (see e.g. Riksrevisionen (2009)). However, this approach is arbitrary and mixes up objective and subjective discounting (Swedish Fiscal Policy Council (2009)).While it makes sense to posit that the subjective political discount rate is larger than the market rate, it does not make sense to use that in the computation of the S2 indicator. The S2 indicator is a market test of financial feasibility (the intertemporal budget constraint), and this has to be done at the market rate of interest.

Alternatively it may be considered to impose a fixed horizon, but this approach is also highly problematic[13]. The determination of such an end point is not without problems, and it has important implications for the results. As an example consider an indicator requiring the debt to GDP ratio at some future time to equal the current debt ratio. The intuitive appeal of this is that it seems to indicate that future generations at the end point will inherit the same initial conditions as current generations. This metric is highly arbitrary since the outcome is very sensitive to the choice of the end-year. Since most countries have a trend deterioration in the budget and hence a tendency for an increasing debt level in the future, it follows that the shorter the horizon, the smaller the problem. Hence, the underlying problems can be concealed by the choice of horizon. Moreover, and importantly, it does not follow that the same debt ratio leaves future generations in the same position as current generations. If the initial debt level is associated with budget surpluses, and the same debt level at the end of the horizon is associated with a trend decline in the budget balance, it is rather obvious that the policy options are not the same. The overlapping generation structure implies that a given end-point may induce rather arbitrary implications for generations living across this end-point. Finally, a fixed horizon, say 2050 or 2060, cannot be maintained but will have to be adjusted from time to time, leaving discrete changes in the assessment of fiscal sustainability problems. The indicator may thus change with the passage of time, even if there are no changes in the projected trajectory[14].

These points are nicely illustrated in Swedish Ministry of Finance (2011), cf. figure 4, where the fiscal sustainability indicators S1 and S2 are computed for different horizons. As expected the indicator values depend critically on the chosen end-year or horizon. In short, imposition of a terminal condition is completely arbitrary and is neither clearly related to the feasibility test nor the normative questions.

However, working with models with infinite horizons is not unproblematic either. A pragmatic approach has to be followed since it does not make sense to work with a model which is literally formulated in infinite time, and therefore it is usually assumed that the economy reaches some steady state at some point far in the future, e.g. in year 2100. However, the results of fiscal sustainability analyses may depend critically on the properties of this steady-state situation; this is in particular the case with low discounting.

---

[13] See e.g. Dasgupta (2005) for a discussion of some logical problems. Diamond (2003) points out that this may create a so-called "clif-problem" in the case of a rolling fixed horizon, when the added year is worse than the preceding year, the assessment worsens just by the passage of time for unchanged policies. A feature which it may be difficult to communicate.

[14] If the requirement is that the debt level in t+k should equal that in t, $d_t = d_{t+k}$, passage of time may cause change in the need for policy changes which are hard to explain. If e.g. the debt path has a U-form it may be that $d_t > d_{t+k}$ while $d_t < d_{t+h}$ (h>k) with unchanged policies. That is, the sheer passage of time will change the situation from one of no problems to one with problems.

**Figure 4: S2 and S1 indicator for various end point years**
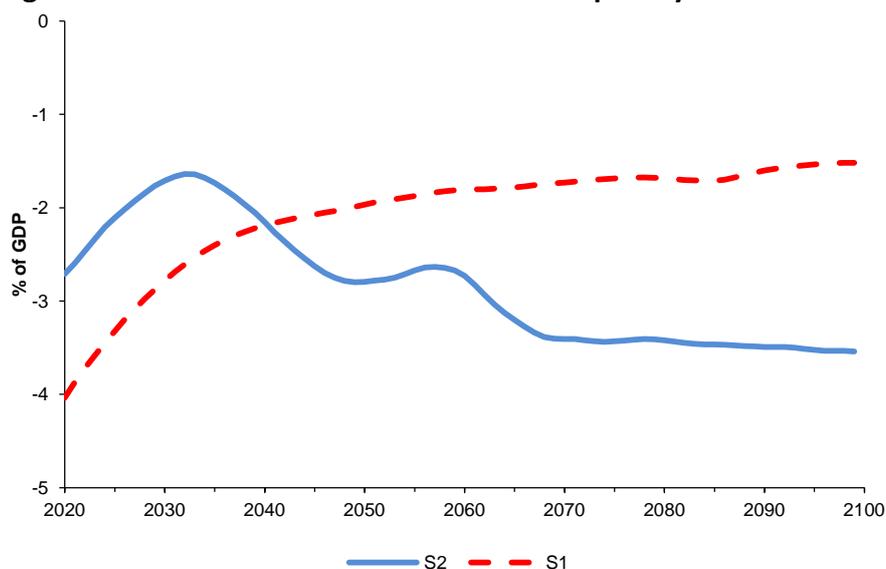
Source: Swedish Ministry of Finance VÅP (2011)

Non-uniqueness problem

A further issue is whether the S2 indicator condenses too much information into a single number. The S2 calculation transforms the budget profile into an annuity value, and hence the same value for the S2 indicator can arise for quite different underlying budget profiles. Hence, even for the same S2 value the policy implications can be quite different. To illustrate this point, consider the profiles for the primary budget balance for Denmark and Sweden in figure 5. Both countries have crisis-induced deficits, but the profiles hereafter differ. Denmark will have deficits for several decades but eventual surpluses in the latter half of the century. For Sweden it is the opposite; surpluses will eventually turn into systematic deficits. The sustainability indicators are roughly the same for Denmark and Sweden, 0.8 and 0.6 respectively[15]. Despite this it is rather obvious that the optimal policy response is hardly the same. This underscores the point that the S2 indicator cannot be interpreted in isolation from the underlying budget profile. The role played by the budget position far in the future is a particular issue since it is obviously very uncertain, and yet it gets a relatively high weight with low discounting, cf above. This problem is overcome by considering the underlying budget profile (and its decomposition into revenues and expenditures).

---

[15] More recent assessments for the two countries differ due to changed initial conditions, reforms and assessments of the developments in expenditures. For Sweden the latest assessment is an S2 indicator of -3.4 % of GDP (see Swedish Ministry of Finance (2011)) and 0.4 % of GDP for Denmark see Danish Ministry of Finance (2011)).

Figure 5: Profiles for the projected primary budget balance, Denmark and Sweden
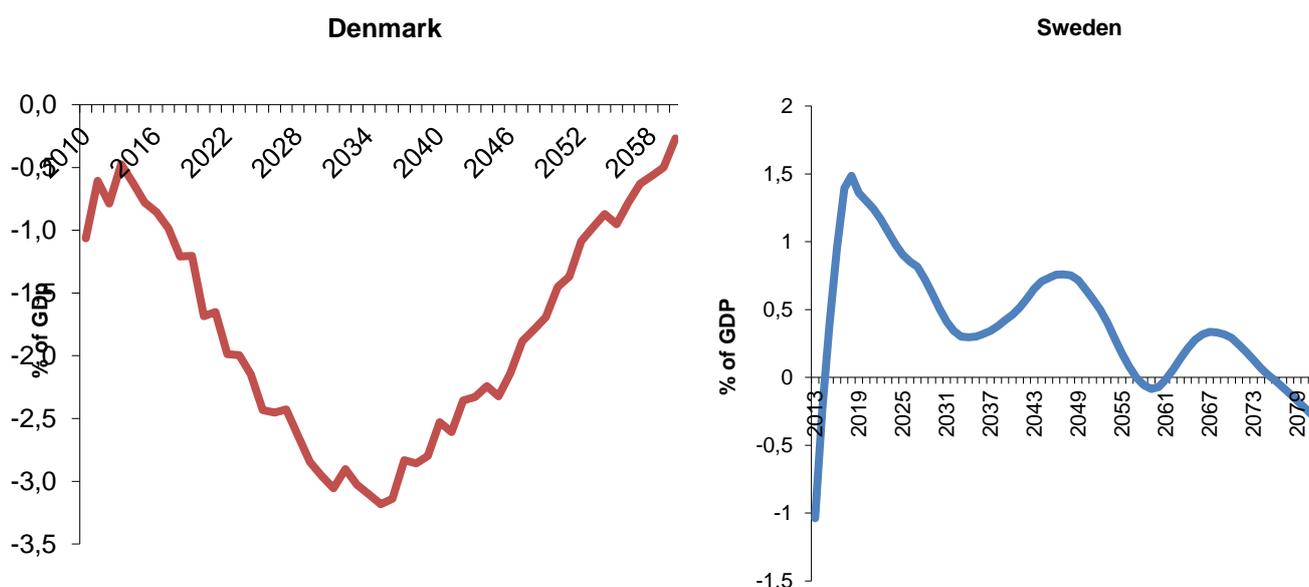
Source: Ministry of Finance Denmark (2010) and Ministry of Finance Sweden (2010).

Unchanged policies

It is not unproblematic to define unchanged policies, firstly because policy rules may not be clearly defined, and secondly because of problems of interpretation (not all systematic policies have been formulated in terms of rules and regulations). Even when formal policy rules are clear, a strict adherence to them may give a distorted picture of actual/likely policies, and also overlook that failure to meet political promises may be problematic.

Consider first transfers. The basic rules defining eligibility for various transfers are usually well-defined, but the development of transfer levels may still be open for discussion. Should formal indexation rules be applied (usually tending to imply that the value of transfers relative to wages decreases over time), or should one apply a reasonable interpretation of historical practice and political objectives which may make it more plausible to assume that transfers in the medium- to long-run follow general wage developments. Adopting the latter assumption may also be interpreted as analysing fiscal sustainability under the distributional constraint that the income of recipients of transfers relative to the working population should remain constant. The importance of assumptions on transfers may be amplified when coupled with demographic developments increasing the number of welfare recipients. As an illustration for Denmark, fiscal sustainability analyses are usually made under the assumption that transfers are indexed to wages[16]. However, if the indexation is shifted to prices for a short period of time (eight year after which wage indexation

---

[16] Formal rules imply that transfers are almost fully indexed to private sector wages.

is resumed, the S2 indicator will improve by 1.2 percentage points (Danish Economic Council (2011)).

Differences in formal indexation rules applying to transfers may also make international comparisons of fiscal sustainability analyses difficult (European Commission (2009)). To take an example some countries have explicit indexing of e.g. pension benefits whereas others have not. In cross-country comparisons this may leave the latter with a better sustainability indicator than the former, other things being equal. But if the non-indexing country in the past by discretionary adjustments regularly has ensured that e.g. the relative pension benefit (either in absolute purchasing power or relative to the general wage development) has been maintained, there is an implicit political liability or promise which needs to be taken into account. Basing the assessment solely on the formal rules will give a misleading picture of actual policies. This points to the problems of defining precisely what is meant by unchanged policies, and its implementation in assessments of fiscal sustainability is not always clear-cut.

Another crucial element is public consumption, which in turn is related to the standards of public welfare services. In principle it is relatively straightforward to determine current standards (teacher per pupil etc.), but how will the costs of providing current standards develop in the future? One extreme is to assume that the Baumol problem applies to all public sector activities; that is, productivity growth is zero (as is the traditional national account convention). In this case costs grow by the wage rate in the public sector, which most plausibly equals wage growth in the private sector (inflation plus productivity growth). In a situation with a constant population, this would imply that expenditures relative to GDP would remain unchanged (balanced growth). Another extreme is to assume that productivity increases in public provision are as for private goods, in which case costs will develop as general inflation. In a situation with constant demographics, the expenditure share will thus decline over time. The difference between these two assumptions for assessments of fiscal sustainability can be rather larger. As an example the difference in the S2 indicator is 3.4 percentage points of GDP for Sweden under the "Baumol"- assumption compared to the alternative assumption (Swedish Ministry of Finance (2011), Swedish Fiscal Policy Council (2011))[17]. Moreover, it may be asked whether one should take outset in current standards, or in a reasonable interpretation of the most likely policy reaction function as captured by e.g. historic growth rates in standards (expenditures), see also below on Baumol and Wagner effects.

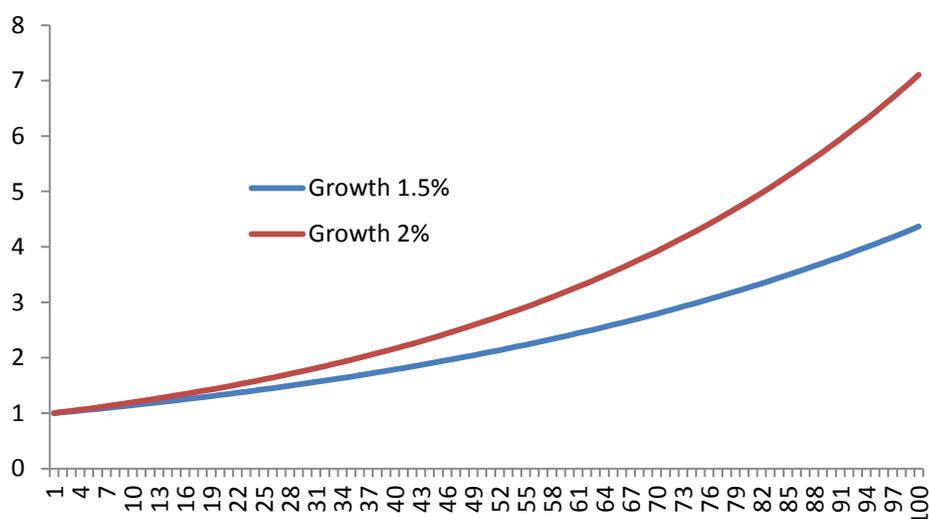### Uncertainty and sensitivity analyses
The assessment of fiscal sustainability is quite sensitive to the assessment of initial structural budget balance since this is usually the benchmark for predicting the structural budget balance in future periods. It is well-known that there are substantial problems in assessing the structural budget balance. Measures tend to show substantial variations and to have a pro-cyclical bias, and

---

[17] In Sweden there have been changes back and forth between these assumptions. Prior to 2009 the alternative assumption was used, between 2009 and 2010 the Baumol assumption was used, and now the alternative assumption is used again. Due to the large importance of this assumption, these changes have been a source of confusion.

hence a substantial source of uncertainty is in this way introduced in the analysis of fiscal sustainability. This problem is particularly large in the present situation where structural budget balances have deteriorated due to the financial crisis, and a stand has to be taken on the speed at which economies recover, and whether the crisis will produce persistent effects on e.g. the structural unemployment rate.

The determination of future budget paths depends critically on a number of trend factors (demographics, growth rates in productivity, costs, standards etc.)[18]. Small changes in trend growth rates can influence the S2 indicator significantly. An example is given in figure 6 showing the profile for a growth rate of 1.5% and 2 %, respectively. As is well-known, small differences in growth rates accumulate to large differences over long horizons; that is, getting the angle wrong has large implications for the projected long-run position. Given the infinite horizon underlying S2 calculations and the low discount rate, it follows that uncertainty wrt trend changes and modest changes in assumptions can have large effects on the assessment of fiscal sustainability. This underscores the point on performing sensitivity analysis and the risk in focussing on a "point estimate" of the sustainability indicator.

Figure 6: The angle problem – small changes in growth rates have large effects on projected paths


Sensitivity analyses are useful not only with respect to clarifying the role of various assumptions made, but also in identifying the factors which may impact the most on fiscal sustainability. The latter is useful in a policy context as an aid in identifying key policy areas of particular importance for ensuring fiscal sustainability beyond the obvious implications of demographic changes. Figure 6 summarizes some sensitivity analyses for Sweden, which point to key factors influencing sustainability. First, the development in both the costs and quantity/quality of welfare services has significant effects on fiscal sustainability. Health is a particular area in this respect since both the

---

[18] Uncertainty is usually analysed via various scenarios. See Alho and Vanne (2006) for an explicit treatment of demographic uncertainty in generational accounting.

possibility frontier and the demand are expected to shift outwards (OECD(2006)), and the implications for fiscal sustainability are large, cf. figure 7. Second, these analyses point to the importance of the employment level for fiscal sustainability. The effect is basic since higher employment creates more income and thus tax revenue at the same time as it reduces expenditures in the social safety net. This "double budget effect" is significant in all OECD countries[19], but obviously stronger in countries with more extended welfare arrangements, and it points to the importance of private employment as a key factor for ensuring fiscal sustainability. The political implication is that structural reforms affecting the employment level in the medium- to long-run have significant effects for fiscal sustainability.

Figure 7: Sensitivity of fiscal sustainability in Sweden
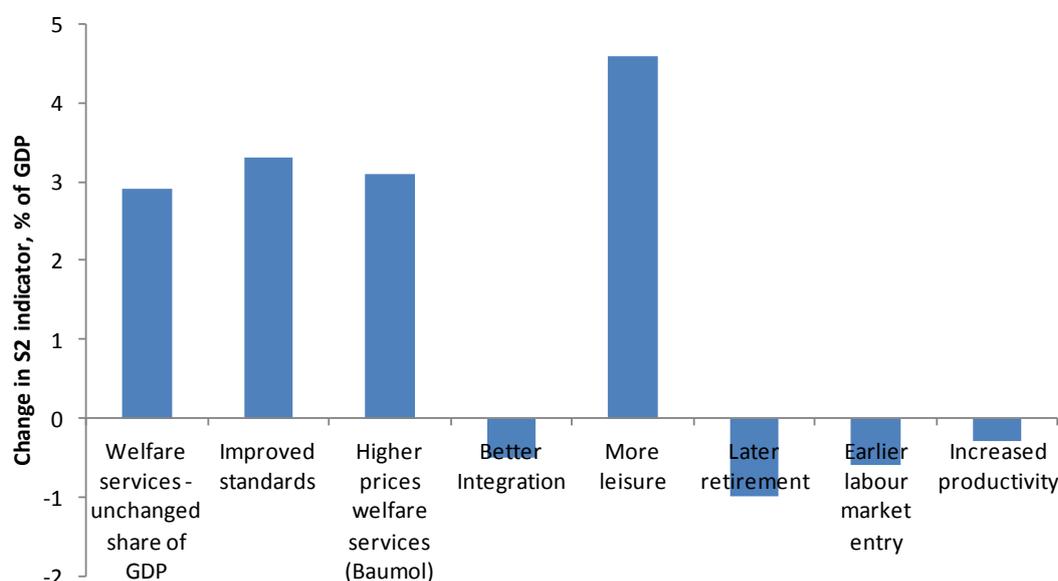
Note: An increase in S2 is a deterioration in sustainability. More leisure is modelled as a decline in annual working hours by 0.3 % pro year, earlier entry into the labour is one year earlier from 2025, later retirement is a 2 year increase from until 2099, better integration reduces the difference in employment rates to 1/3 of the existing difference.
Source: Swedish Ministry of Finance (2011)

The approach of reporting a permanent requirement to the primary budget balance to ensure fiscal sustainability (S2) may be criticized for not bringing forth the explicit policy instrument[20]. In support of this approach it may be argued that the aim is to identify the problem and not to suggest the specific political decision to be taken, while the argument against is that the difficulty in attaining fiscal sustainability may be underestimated.

---

[19] OECD(2011) reports elasticities of the budget balance (measured relative to GDP) wrt. employment rates in OECD countries, and it ranges between 0.3 and 0.7.
[20] See Andersen and Pedersen (2006a) for an analysis of fiscal sustainability where the policy requirement is specified in terms of needed tax changes, and where the distortionary consequences of tax changes are taken into account.

Finally note that the risk involved depends on policies, and the analysis of fiscal sustainability may be suggestive for how to design policies so as to reduce risk. If the system includes e.g. an adjustment mechanism linking retirement ages to longevity, it follows that fiscal sustainability is less sensitive to variations and thus projections of the path for longevity than if there is no such adjustment[21].

Figure 8: Sustainable path: Trajectory for primary and total budget balance, and debt level, % of GDP - Denmark
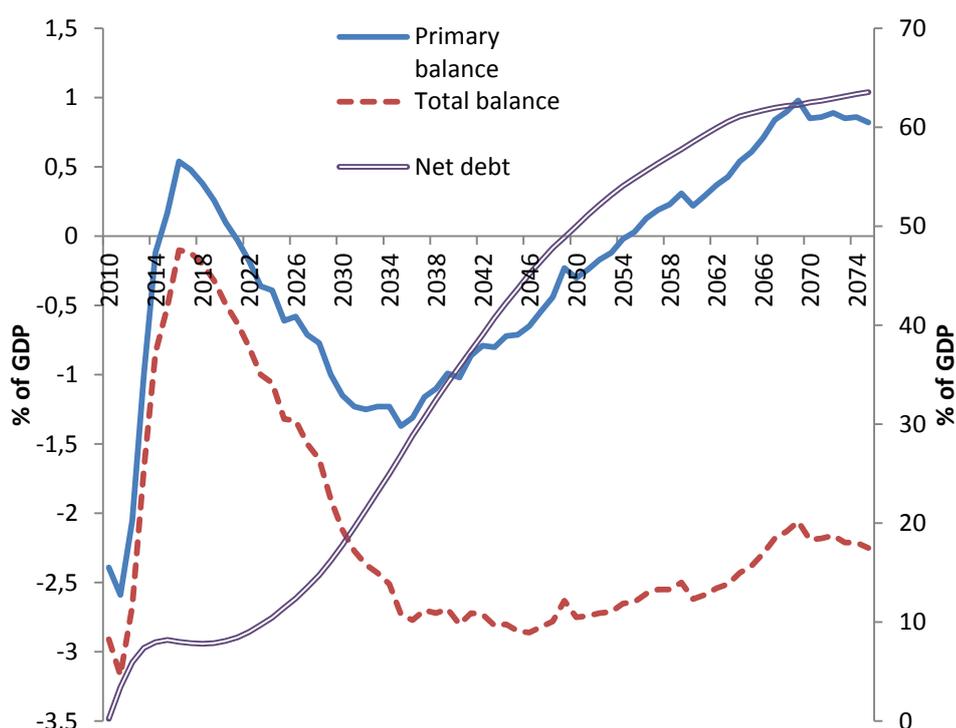
Source: Danish Economic Council (2011).

Fiscal sustainability and fiscal limits

Even if policies are fiscally sustainable in the technical sense that the sustainability indicator S2 is zero (or negative), the underlying deficit and debt path may be problematic. This is illustrated in figure 8 for Denmark. The path shown satisfies the intertemporal budget constraint (S2=0), but there are substantial variations in deficit and debt levels, and net-debt converges to a rather high level[22]. In the long run, the primary surplus is sufficiently large to balance the debt servicing and

---

[21] Denmark has introduced an explicit indexation scheme whereby the statutory retirement age (early retirement, and public pensions) follows the development in expected longevity at the age of 60.

[22] Note that in the long run for a constant debt-to-gdp ratio (d/y) we have that the debt level is related to the total budget balance (t/y) as (d/y)=((1+g)/g)(t/y), where g is the growth rate of gdp.

thus maintain a constant debt level. This case underscores the point that fiscal sustainability can be consistent with quite different trajectories for deficits and debt. A prolonged period over several decades with systematic budget deficits and an accumulating debt level clearly create a risky position. Moreover these developments are in conflict with the fiscal norms of the Stability and Growth Pact, and the debt level[23] will approach or pass "fiscal limits" which will release financial market responses affecting the government bond rate (and thus violating the assumption of a given discount rate underlying the sustainability assessment) and eliminating degrees of freedom in fiscal policy.

A problem with the S2 indicator is that it is computed without taking the "fiscal limits" into account. The maintained assumption that the discount rate is exogenous to the budget profile is thus questioned. To phrase it differently, the smoothing idea underlying the S2 indicator may be contested by fiscal limits. A non-flat consolidation profile may violate tax smoothing, but this may be optimal since it moves debt and budget balances away from fiscal limits, thereby reducing the interest rate, and the advantage of the latter may dominate the cost of the former.

3. Interpreting S2 measures: From the positive to the normative part

The annuity property of the S2 indicator implies that it implicitly shares a given adjustment burden equally (as % of GDP) across an infinite future and thus current and future generations. The assessment of the sustainability indicator serves an important positive purpose in clarifying whether there is a need for policy changes, but it cannot automatically be given a normative interpretation as to how policies should be changed. To take a specific example, if a systematic deterioration in the budget balance arises as demographic changes unfold, then the policy response implied by the S2 indicator is to improve the budget balance immediately and permanently, cf figure 1. This would tend to induce pre-funding prior to the demographic change, but this implies that current generations are contributing to the financing of problems arising in the future – is this fair?

The S2 measure is to be interpreted as an indicator of the need for reforms. It is expressed in terms of the permanent budget improvement to obtain an easily interpretable quantitative measure, but it is silent on optimal policy responses and hence on strategies, specific instruments and their timing. Different types of reforms with different timing (assuming time consistency) are possible to ensure sustainability. Therefore one cannot readily infer from a positive identification of reform

---

[23] The figure shows the net debt level. Initially in 2010 the net debt is close to zero while the gross debt is above 40% of GDP. Assuming the same difference between net and gross debt, it follows that gross debt will approach 100-110% of GDP. Since Denmark pursues a fixed exchange rate policy vis a vis the Euro, financial market responses are likely at most lower debt levels.

needs and its quantitative expression in terms of permanent budget improvements, to a normative prescription that the optimal reform is a permanent budget improvement given by the S2 measure.

The fiscal sustainability indicator can be interpreted from two different angles (see Andersen (2010)), a tax smoothing and a consumption smoothing perspective. The standard interpretation is based on the idea of *tax smoothing*; that is, distortions from taxation are minimized by keeping tax rates constant, and therefore the budget should be allowed to absorb temporary variations in revenues or expenditures (Barro (1979)). Permanent expenditure changes require a permanent change in the tax rate.

Via public deficits and debts, resources are also transferred across time and thus generations. Intergenerational distribution and risk-sharing is thus involved. The fiscal sustainability indicator can be given an *risk diversification* or consumption smoothing interpretation since it by construction transforms any changes into an infinite annuity implying that the burden is equally shared across time and thus generations (in the sense of a requirement to the primary budget balance relative to GDP). Such risk sharing can be justified by failures of private markets to offer scope for perfect risk diversification, not least across generations. Intergenerational distribution raises more subtle questions. Interpreted from this perspective the policy implications to be inferred from a given sustainability problem depend on the causes underlying the initial situation, the elements of risk sharing involved, and a question of possible trends in the budget balance.

Initial conditions

The initial condition for the assessment of fiscal sustainability is the net debt position which summarizes the consequences of the past of relevance for the future as concerns public finances. It may be argued that the public net debt level is the key variable affecting future generations. Future generations may want to take different decisions than current generations, and it is not obvious that the former should constrain this possibility. Bygones are bygones and therefore the relevant part of the past of importance for future decision making is the debt level; i.e. "leaving all future generations with the same options as current generations". Logically this reasoning would require that a broader approach is taken to evaluate the net-assets left for future generations. This is an important issue, but beyond the purpose of an analysis of fiscal sustainability.

Whether the initial debt level should be subsumed into problems to be diversified over time is an open question. These issues are complicated by the fact that there is no well-defined debt level or target. Fiscal sustainability is consistent with an infinity of debt levels since any debt level translates into a requirement for debt servicing which affects the sustainability indicator. The initial debt level may be interpreted as being the accumulated consequences of past failures to adjust policies. If so, the initial debt level should be coped with by current generations and not in part transferred to future generations. If the debt level accumulates past shocks to be diversified over time, there is a reason to take a smoothing perspective, as further discussed below.

Insurance:

It is well-established that the public budget can offer risk diversification across time and thus generations, and on terms which private markets cannot (see e.g. Gordon and Varian (1988)). There is a very close relationship between the sustainability indicator and basic insurance or risk diversification arguments (see Andersen (2010)). Hence, as concerns shocks affecting public finances, the sustainability indicator translates this into a needed budget change in precisely the same way as basic risk diversification theory would diversify the shock. To put it differently, the effect of shocks on the sustainability indicator gives the requirements to diversify these shocks over an infinite period[24]. In theory there are good arguments for letting the public balance serve this insurance function which is basically embedded in automatic stabilizers. If we think of business cycles as driven by exogenous shocks propagated by internal adjustment mechanisms, there is a strong smoothing argument for using the public budget as a buffer (the basic rationale for stabilization policy).

The insurance argument applies only to exogenous shocks, and there is a political economy or moral hazard side to this insurance mechanism. For it to operate it has to be symmetric; that is, "good" periods should be reflected in surpluses for "bad" periods to justify deficits. It may be questioned whether this condition is met by most OECD countries since ex ante to the crisis in the booming years only very moderate consolidation took place. In addition it may be argued that to the extent that the crisis is induced by excessive risk taking on the part of current generations, it is not obvious that the consequences should be diversified via intergenerational risk sharing. If the crisis is due to "overborrowing and overspending", there is a no-bail-out argument for a quick "repayment" since "current generations causing the crisis should also pay for it". This argument seems relevant to the public finance consequences of the financial crisis.

It is an implication of the above that to the extent that the crisis has led to a significant different assessment of potential output, structural unemployment etc., and therefore of the structural budget balance, this calls for an immediate change in budget policies. Such structural changes cannot be diversified over time, and this would require permanent policy changes.

Trends:

Clarifying an optimal profile for the budget balance and public debt involves issues of intergenerational distribution. Such concerns are also often used to justify policies in this area encapsulated in statements like "not leaving any bills to the children". However, issues of intergenerational distribution are subtle, and a zero (or constant) net debt is not necessarily tantamount to distributional neutrality. To make just a few observations, both increasing longevity and a trend increase in the demand for public services are factors benefitting future generations, and if current generations via pre-funding as implied by the S2 indicator are required to contribute to their financing, it may imply a significant intergenerational redistribution.

---

[24] This may also give an argument for some precautionary savings, see van der Ploeg (2008).

Productivity increases leave future generations with a choice between consumption and leisure, and to the extent they choose more leisure, they will have less taxable income. Hence a simple income comparison across generations will not fully capture the differences in the choice sets across generations. Under standard assumptions[25] and a plausible upward trend in productivity, there is an argument for consumption equalization or smoothing across time and generations. This entails that future rich generations should contribute to improve the consumption possibilities of current less rich generations, and this is ensured by running deficits to be financed by future generations (see e.g. Andersen and Gestsson (2010)). Moreover, it is a question whether income for different generations should be compared in absolute or relative terms. If seen in absolute terms, there is an argument for consumption equalization as discussed above. However, this notion can be contested by arguing that relative income or consumption possibilities are important[26], and attempting to equalize absolute income levels across generations will imply that future generations will have lower consumption possibilities than in other countries. Hence, achieving such a path may be questioned both in terms of fairness and justice, but also in terms of feasibility[27]. These are important and difficult questions which need to be clarified to assess intergenerational distribution issues.

Sustainability problems are to a large extent driven by underlying trends of which changing demographics are an important contributory factor. An important driver of these changes is increasing longevity (healthy ageing), and for this component it is highly questionable whether it should be addressed by pre-funding or savings (see e.g. Andersen(2012)). Increasing longevity is a welfare improvement, and the reason it creates financial problems is that some future generations enjoy increases in longevity, while retirement ages do not necessarily follow, and at the same time various entitlements for services provided by the public sector are used more. This shifts the balance between the years contributing to and benefiting from the scheme, causing a sustainability problem. It is not obvious that current generations should be contributing to the financing of this, or whether the proper response is to change entitlements (e.g. retirement age or pensions). Important trade-offs are at stake here between consolidation and reforms changing the underlying entitlements to welfare policies broadly defined.

Fiscal sustainability analyses take outset in current policies and ask whether they are sustainable. In many respects this may be considered a conservative assumption since demands and needs for publicly provided services and transfers may change over time. A particular issue is the role of

---

[25] Under standard utility functions a utilitarian planner will aim at equalizing consumption possibilities across generations, and hence if future generations are richer than current generations there is an argument for running deficits to finance higher consumption levels for current generations, and leaving the financing to richer future generations. In this way consumption possibilities are equalized across generations.

[26] As a consequence generational comparisons often compare consumption possibilities by correcting incomes for productivity growth (see e.g. Cardarelli et al. (2000) and Danish Economic Council (2004)).

[27] If future generations are expected to redeem a large debt, some may opt out of the implicit contract by migrating. The larger the difference in consumption possibilities (living standard), the larger the pressure.

relative price increases driven by differences in productivity between services and other goods (Baumol's disease) and the fact that certain services like health care plausibly have a demand with a high income elasticity (Wagner's law). In addition improvements in health care and treatment may create new demands (OECD (2006)). Various analyses of these issues show that sustainability problems can easily increase significantly (see e.g. above, and Andersen and Pedersen (2006b)). From a policy perspective it is very important to perform such analyses to prepare for the needed prioritization and to inform the general public on what the public sector can be expected to accomplish in terms of service provision. Such analyses are useful in identifying trends which policy makers will have to address, but since they are mainly driven by the fact that future generations are richer and have better options than current generations, it is not obvious that these issues should affect the formulation of short-term budget policies and consolidation targets.

Two points are particularly important. First it is important to consider the underlying time profile of the budget balance underlying a given S2 measure. The policy implications are not the same if a given S2 indicator is caused by a systematic tendency to budget deficits in the near future rather than in some distant future. Second, it is important to identify the specific causes underlying a given assessment of the S2 indicator. To take an example, it is likely that health care will both be in larger demand and more costly to produce in the future (Baumol effect) because future generations are richer, productivity is higher, and due to progress in life science. It is important to assess the orders of magnitude underlying these trends for several reasons including expectations concerning public health services, reforms to enhance efficiency, settling dividing lines between public and private provision, financing (user payment, insurance, taxes etc.) etc. However, if these developments lead to a sustainability problem, it is far from obvious that it is optimal to respond to this by an immediate consolidation of public finances – Why should current generations contribute to finance more health services for future generations, when this is basically driven by the fact that they will be more affluent than current generations?

In sum, the S2 metric is a useful summary measure of the fiscal sustainability of current policies, but it does not have any straightforward normative implications. A particular issue is whether current policies or proposed reforms have significant implications for intergenerational distribution, and whether these are intended or not. The inherent logic of tax financed welfare arrangements is that they are pay-as-you-go in nature, although deviations can be justified in terms of risk sharing. The prior is thus that the public budget should systematically be (close to) in balance, otherwise explicit reasons are given to the opposite.

4.   *Intermediary indicators for fiscal policy*

Analyses of fiscal sustainability have to be transformed into intermediary indicators or targets for fiscal policy. Such targets are instrumental in short-term policy planning and monitoring. Ideal intermediary targets are well-defined and easy to measure and closely related to factors under

political control. Thereby they serve the purpose of helping in ensuring political accountability and increasing the political costs of opportunistic policies.

A key question is whether there should be only one or several intermediary targets. The underlying uncertainty and the problem of unravelling the underlying state of the economy are arguments for having a portfolio of intermediary measures since they all have pros and cons. The primary advantage is that many targets imply some risk pooling and allow some learning. A disadvantage is that it leaves open when to react (when one or all measures are off target?), but also that it creates lack of transparency since policy makers may shift between targets depending on performance; i.e. it is more difficult to hold policy makers accountable with several targets. Overall this goes in the direction of having few/one intermediary target. It is essential that targets are few in number since numerous targets may be confusing and can undermine political control. Furthermore, some targets can always be highlighted as fulfilled if there are many to choose from.

For all indicators or targets there is both a *filtering* problem and an *error-correction* problem. The filtering problem refers to the need to separate cyclical and temporary influence beyond political control from political decisions. The purpose of targets is to hold politicians accountable for their policies relative to their stated targets/objectives. The error-correction problem refers to how to adjust the failures and shocks in the past so as to remain on track relative to the medium- to long-run objectives. An immediate response to bringing the variable to its target value will not in general be optimal since the underlying objective is to smoothen policy responses. Hence, there is a *response problem*. This problem is larger, the larger the filtering problem since there is a risk of overreacting to temporary variations which have been incompletely separated from trends[28]. Ideal targets minimize the filtering problem and specify an error-correction mechanism.

Two different approaches may be taken in setting intermediary targets, either a fixed time or a target zone approach. Targets are set for a given period (e.g. expenditures or debt should be below a certain level by the end of the planning period) at the end of which policies/targets are revised and set for a new period[29]. This has the advantage that it is easy to communicate and match political desires to formulate plans, e.g. after an election. One problem is that clear needs for revision of targets may arise before the end of the planning period[30]. This suggests that a new plan

---

[28] One of the intermediary targets used by the Swedish government is a running 7 year average of the budget (past three years, current year, and coming three year budget period), and hence this measure both filters the past (minimizing risk of reacting to temporary changes) and smooth responses (not taking all the adjustment immediately).

[29] The setting of a target value may be particularly difficult when there is an underlying trend due e.g. to demographic changes. Setting the target at the average value planned over the period would lead to systematic differences over the entire planning period. This is an argument for a short planning period, but a too short period leaves little flexibility. For the target zone the similar problem is that the targeted value is time dependent, and therefore the target zone is a moving zone. This is very difficult to handle in terms of communication and thus transparency, and if the pragmatic solution is to shift the target values at discrete intervals, then this effectively becomes a fixed time horizon plan.

[30] The determination of the planning period involves a trade-off between flexibility (short period) and commitment (long period). There is a risk of front loading within the planning period, e.g. reaching the expenditure or debt target early in the period, and the question is how discipline is enforced in this case?

should be launched in such cases. But this possibility also opens for a more lax interpretation of the whole framework "we missed the target, let us formulate a new target for a new period"; i.e. there is a risk that the commitment value of the framework is reduced. An alternative is to set a target zone with target values and allowing variations within some interval, and to undertake policy adjustments if the boundaries of the target zone are hit (such target zones are known from exchange rate policies and pricing policies)[31]. This may seem a more flexible solution since it allows room for some variations only calling for initiatives when the boundaries of the zone are met. An obvious question is how to set the threshold for the zone (how wide should it be?). Such a scheme also opens for a possible bias by leaning to one side of the band (for instance the upper limit for expenditures or debt) creating asymmetry which increases exposure to shocks.

Another shared problem is how to adapt the framework to new assessments of fiscal sustainability. This applies to past errors and to changes in expectations concerning the future. This is most easily handled in a fixed time horizon framework since the adaptation can be made when a plan for a new time period is launched, whereas this option is not readily available in the case of a target zone (the whole zone has to be reset). This points to the fact that it is not possible to apply a strict target zone approach since the parameters of the target zone will have to be adapted either at regular intervals or when sufficient new information is collected to warrant a change.

Intermediary targets for fiscal policy

If the policy objectives have been clarified, it implies a trajectory for public revenues (T), expenditures (G), the primary budget balance (B) and the public debt level (D) (from these other intermediary targets for e.g. the employment level may be derived). In principle all of these variables could be made intermediary targets for fiscal policy to ensure that the path underlying fiscal sustainability is fulfilled and various policy objectives are reached. Of course these variables are interrelated since a given path for expenditures and revenues imply a path for the budget balance, which in turn influences public debt.

Since the aim is to ensure fiscal sustainability, it may seem obvious to make the sustainability indicator the target (proposed by Riksrevisionen (2009)). [32] However, this indicator is a calculated metric which is not continuously measured, and it may be difficult to monitor (cannot be computed by outsiders). Moreover it is a technical concept not widely known and easily interpretable as argued above. Most importantly sustainability can be consistent with an infinity of trajectories for public finances, and this makes the metric unsuitable as a short-run guide for fiscal policy.

---

[31] Target zones for fiscal policy are known from the public finance requirements of the Stability and Growth Pact having one-sided targets in terms of a maximum debt-to-gdp ratio (60%) and budget deficit relative to gdp (3 %). The proposal for a so-called fiscal compact also has a one-sided zone defined in terms of the structural budget balance relative to gdp (0.5%). The UK had a one-sided debt target stipulating a maximum of 40% of gdp prior to the financial crisis.

[32] In Swedish Ministry of Finance (2010) it is proposed to divide sustainability into three groups depending on the sustainability indicator S2. If the absolute value of the indicator is less than one, this is taken to imply that the current policies are sustainable, and there are thus no financial reasons for policy changes. A sustainability indicator between 1 and 3 indicates that the economic policy most likely needs to be changed, while an absolute value above 3 indicates that there is a clear case for undertaking a policy change.

The public budget balance is regularly accounted for and reasonably well understood, and it is fairly directly related to policy decisions. The problem is that the primary budget position is affected by short-run factors (business cycles), and hence the structural budget balance is more appropriate theoretically. But this is a calculated metric, which is more subtle to interpret and communicate. It is well-known that estimates of the structural budget balance are subject to substantial revisions between early ex ante and later ex post evaluations[33]. The method used varies a lot across countries, and is in most cases rather aggregate, and residual based.

The debt level may be an alternative candidate since it is regularly measured and well understood. It may be argued that the public debt level is the key variable affecting future generations. Future generations may want to take different decisions than current generations, and it is not obvious that the former should constrain this possibility. Bygones are bygones, and therefore the relevant part of the past of importance for future decision making is the debt level; i.e. "leaving all future generations with the same options as current generations". This is also illustrated by the fact that any assessment of fiscal sustainability is based on the initial debt level in combination with projected paths for revenues and expenditures. To reach a given debt level, it may however be useful to target the structural budget balance since it is closer related to policy decisions. One problem with the debt level as an intermediary target is that in the short run it is not that closely related to policy decisions since asset price variations can cause substantial variation in the debt level for unchanged policies. If these variations are perceived as temporary, they should not affect assessments of fiscal sustainability significantly.

Both the budget balance and the debt level suffer from the problem that there are substantial short-run variations which are not necessarily related to policy decisions, and hence not something which policy makers should be held accountable for. It is well-known that revenues are much more exposed to cyclical and temporary variations than the expenditure side. It is also often the case that slippage in budgetary control arises from failures to control public expenditures[34]. This gives a strong argument not only for focussing on the financial position (whether the change (budget balance) or the level (debt)) but also for including a level variable in the form of expenditure targets.

The Swedish Fiscal Policy Framework and the new European Fiscal Compact
It is instructive to consider the Swedish Fiscal Policy Framework because it has been in place for some years and because it has been rather successful (see Swedish Government (2011) for an

---

[33] Also changes far in excess of what can be attributed to policy changes. The problem of assessing the structural budget balance relates to estimates of cyclical budget sensitivities, and output gaps as well as temporal and one-off items affect the budget. Moreover the method applied is a residual method in the sense that the structural measure is found by subtracting cyclical and temporary effects from the actual balance. All errors in this procedure are thus attributed to the structural balance. For a discussion see e.g. Swedish Fiscal Policy Council (2011).

[34] Holm-Hadulla et al. (2010) show that expenditure restraints and numerical expenditure rules are important for maintaining budgetary discipline.

account of the framework). The core elements of the framework are i) a nominal expenditure ceiling announced with a rolling four year horizon (coming year, and subsequent three budget years), ii) a surplus target stipulating that the surplus should be at least 1 % across the business cycle, and iii) a balance budget requirement for the public sector. This framework has existed in this form since 1997, and it grew out of the need to consolidate public finances after the deep crisis in the early 1990s. It has been maintained and later justified in terms of forward planning, not least in relation to demographic changes. Since 2007 the fiscal framework has been monitored by the independent Swedish Fiscal Policy Council.

The expenditure ceiling is a key element of a top-down procedure in expenditure planning which enforces a stronger prioritization between different demands for expenditure increases since the overall target for total expenditures has to be fulfilled. The surplus target is set with an aim both to ensure some consolidation and to increase the ability to handle demographic changes. The surplus target is monitored via three indicators[35]: i) a seven year indicator for the budget balance (past three years, current year, and coming three years), ii) a seven year indicator defined for the structural budget balances, and iii) the structural budget balance.

Figure 9: Expenditure ceiling and actual expenditures – Sweden 1997-2014.
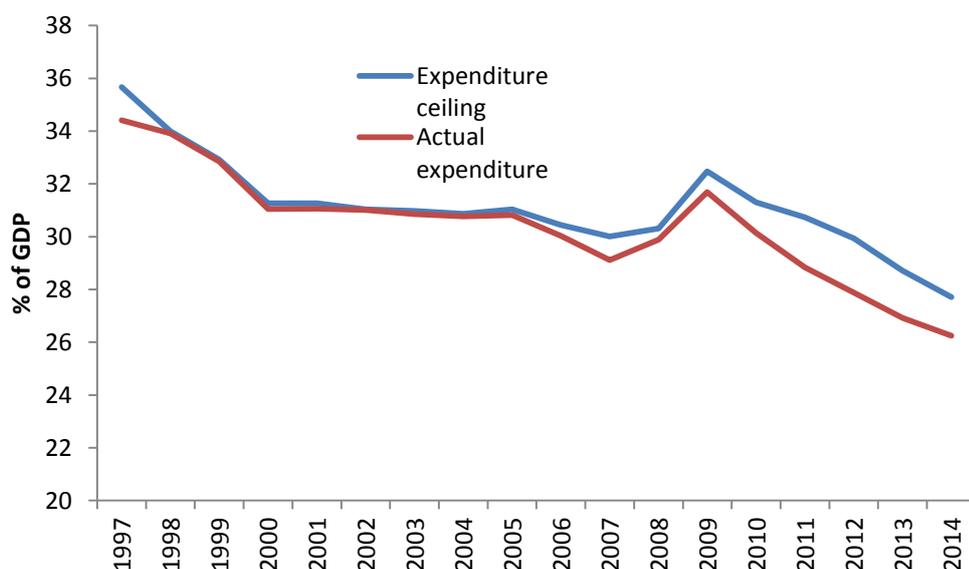
Note: Data for 2011-14 are forecasts
Source: Swedish Ministry of Finance (2011).

While many details of the Swedish system are open for debate, the overall performance has been in accordance with the targets. This is also reflected in the fact that Sweden has accomplished a significant consolidation prior to the financial crisis, which has implied both that public finances

---

[35] The indicators have changed over time, see e.g. Swedish Fiscal Policy Council (2011).

have not been under pressure during the crisis and that Sweden has had room to pursue an active countercyclical policy. Sweden is also among the few countries which do not face a significant problem with fiscal sustainability[36]. Figure 9 shows the development of expenditures relative to target and the public sector budget balance for the period 1997-2014.

Germany has recently introduced a fiscal framework with the following key elements: i) The structural budget balance is to exceed -0.35 % of GDP [37], ii) this limit can be exceeded in case of large natural disasters (escape clause), iii) deviations from the target are accumulated (control fund) and an adjustment has to be undertaken if the accumulated deviations exceed 1.5 % of GDP, iv) all "Länders" are subject to a balanced budget requirement.

The German system has inspired the so-called European Compact (European Council (2011). This strengthens the Stability and Growth Pact by requiring among other things i) that central government budgets shall be balanced or in surplus; this principle shall be deemed respected if, as a rule, the annual structural deficit does not exceed 0.5% of nominal GDP, but for countries where the debt level is below 60%, a deficit of up to 1% of GDP is allowed ii) such a rule will also be introduced in member states' national legal systems at constitutional or equivalent level. The rule will contain an automatic correction mechanism that shall be triggered in the event of deviation. It will be defined by each member state on the basis of principles proposed by the Commission. In addition initiatives are proposed to strengthen the monitoring and corrective arm.

Many details of the new European Fiscal Compact are yet to be determined. There are however some problematic parts. Setting an intermediary target as a one-sided target zone for the structural budget balance is problematic for several reasons. The determination of structural budget balances is riddled with problems and methods differ across countries[38]. Assessments of structural budget balances are not easily made and reproduced, which makes problems of control and comparison difficult. The one side zone is also problematic since it is unconditional of other parts of public finances. One concern is that the lower bound is in conflict with stabilization policy. Automatic budget responses and thus the automatic stabilizers will not affect the structural budget balance, and can thus be contained within the 3 % limit on the actual budget. However, a sufficient margin for countries with large automatic stabilizers requires that the structural balance is in surplus (as has been argued in e.g. Sweden). However, maintaining systematic surpluses to attain stabilization freedom is not efficient, and although many countries are in a situation where consolidation needs go in the same direction, this is a potential source of conflicts, especially since not all European countries face large sustainability problems, cf. figure 2. Finally, the fiscal compact lacks the level

---

[36] The Swedish Ministry of Finance (2011) assesses that the S2 indicator for Sweden is -3.4%; i.e. there is room for a permanent reduction in taxation or increasing in expenditures of 3.4% of GDP within the intertemporal budget constraint.

[37] Note that the overall deficit level for the public sector is -0.5%, but since about 70% of debt is at the Federal level, the federal deficit limit has been set at -0.35%, see Baumann et.al. (2008).

[38] OECD uses a rather aggregate approach, while ECB uses a more disaggregate approach. See Swedish Fiscal Policy Council (2011) for a discussion.

dimension. While it may be argued that the common interest is related to deficits and debts, it remains that levels targeting is important to achieve these targets, and as the Swedish experience shows the expenditure target has been crucial in reaching the targets related to budget balance and consolidation.

5 Concluding remarks

Assessment of fiscal sustainability is an indispensable decision tool for fiscal policy. Such analyses provide useful information on the need for policy changes or the scope for policy prioritization in terms of taxes or expenditures. The key output of such an analysis is the trajectory for deficits and debt. This can be summarized in the sustainability indicator (S2). While this serves the purpose of facilitating communication, it can be criticized for aggregating too much information into one metric in a way which is very sensitive to the discount rate and the horizon. Hence, important information may be lost relative to a consideration of the profile, which also makes it easier to assess whether particular fiscal limits are approached or passed unless policies are changed.

While deficits and debts may serve a purpose in terms of tax smoothing and intergenerational risk sharing, it is the case that a tendency towards systematic budget imbalance reflects a fundamental problem in the design of expenditure and taxation systems. Rather than attempting to address this problem by some equal sharing rule as implied by the S2 metric, it may be argued that the most robust solution is structural reforms taking the trend out of the budget balance (which effectively amounts to targeting a debt level/balanced structural budget). Such a trend tends to reflect intergenerational redistribution going in the direction of benefiting future generations (better health, longer longevity, more demand for public services and leisure etc.). A trend implies that there is an underlying redistribution across generations. Hence, rather than taking this for granted one may reverse the burden of proof ; that is, structural reforms should be undertaken to remove the trend unless there are strong reasons for maintaining it (cf. discussion above of trends implied by health care, demographics). Specifically, this calls for a very precise identification of why there is a trend in the budget balance, and that a stand is taken on whether this is due to lack of appropriate reforms, or whether there is a clear case for intergenerational (re)distribution. One may also pragmatically say that if there is no trend within the next 20-25 years, then there is no immediate need for policy initiatives (there is still a need to continuously make sustainability assessments to discover trends in due time). It may be argued that although there is no need to adhere to a balanced budget requirement in a strict sense, welfare policies build on a PAYG-principle and therefore trends over long periods should not be allowed to develop.

References:

Alho, J, and R. Vanne, 2006, On Stochastic Generational Accounting, International Studies in Population, 2006, Volume 3, 291-303.

Andersen, T.M., 2010, Fiscal sustainability in the wake of the financial crisis, Nordic Economic Policy Review, 1, 71-109

Andersen, T.M., 2012, Fiscal Sustainability and Demographics – Should we Save or Work More?, Journal of Macroeconomics, to appear.

Andersen, T.M. and Pedersen, L.H., 2006a, Assessing fiscal sustainability and the consequences of reforms, in European economy. Economic Papers. No. 248. European Commission. Brussels.

Andersen, T.M. and Pedersen, L.H., 2006b, Financial restraints in a mature welfare state - the case of Denmark, Oxford Review of Economic Policy 22(3), 313-329.

Andersen, T.M., and M. Gestsson, 2011, Longevity, Growth and Intergenerational Equity - The Deterministic Case, Working Paper.

Auerbach, A.J., Gokhale, J.J. och Kotlikoff, L.J. (1991), Generational accounts: A meaningful alternative to deficit accounting. In Bradford, D. (red.). Tax Policy and the Economy, vol 5, MIT Press, Cambridge, MA.

Barro, R. (1979), On the Determination of the Public Debt, Journal of Political Economy, 87, 940-71.

Baumann, E., E. Dönnebrink, and C. Kastrop, 2008, A Concept for a New Budget Rule for Germany, CESifo Forum 2/2008, 37-45.

Blanchard, O.J. and F. Giavazzi, 2004, Improving the SGP through a proper accounting of public investments, CEPR Discussion Paper 4220.

Cardarelli, R., Sefton, J. och Kotlikoff, L. J. ,2000, Generational Accounting in the UK, Economic Journal 110.

Danish Economic Council, 2004, Dansk Økonomi – Foråret 2004, Kap 3 Fordeling mellem generationer, København.

Danish Economic Council, 2010, Danish Economy- Spring 2010, Copenhagen.

Danish Ministry of Finance, 2010, Danmarks Konvergensprogram 2009, Copenhagen. Danish Ministry of Finance

Danish Ministry of Finance, 2011, Reformpakken 2020 – Kontant sikring af Danmarks Velfærd, Copenhagen.

Dasgupta, P., 2005, Three conceptions of intergenerational justice, in H. Lillehammer and D.H. Mellor, eds., Ramsey's Legacy, Oxford: Clarendon Press.

Deeg, V., Hagist, C. och Moog, S., 2009, The fiscal outlook in Austria: An evaluation with generational accounts, Empirica 36(4), 475-499.

Diamond, P., 2004, Social Security, American Economic Review, 94/1), 1-24.

Draper, D.A.G och Armstrong, A.M. (2007), GAMAA – A simulation model for ageing, pensions and public finances, CPB Discussion Paper 147.

DREAM, 2010, DREAM - Model dokumentation, http://www.dreammodel.dk/

DREAM, 2011, Langsigtet økonomisk fremskrivning 2010, Copenhagen.

European Commission (2006), The Long-Term Sustainability of Public Finances in the European Union. A Report by the Community Services.

European Commission (2009), Sustainability Report 2009, Bruxelles.European Commission 2006

European Commission, 2010, Public Finances in the EMU, Brussels.

European Council, 2011,

Gordon, R. and H.R. Varian (1988), Intergenerational Risk Sharing, Journal of Public Economics, 37, 185-202.

Hagist, C., Moog, S., Raffelhüschen, B. och Vatter, J. ,2009, Public debt and demography – an international comparison using generational accounts, CESifo DICE Report 4/2009.

Holm-Hadulla, F., S. Hauptmeier, and P.Rother, 2010, The Impact of Numerical Expenditure Rulres and Budgetary Discipline over the Cycle, ECB Working paper 1169.

Lundvik, P, Lüth, E. och Raffelhüschen,B ,1999, Generational Accounting in Europe, European Economy 6

Nordhaus, W.D., 2008, Baumol's diseases: A macroeconomic Perspective, B:E. Journal of Macroeconomics.

OECD, 2006, Projecting OECD Health and Long-term Care Exoenditures: What are the Main Drivers?, Economics Department Working Paper, 477.

OECD, 2011,Employment Outlook, Paris.

Petterson, T., Petterson, T. och Westerberg, A. ,2006, Generationsanalyser – omfördelning mellan generationer i en växande välfärdsstat, ESS 2006:6.

Riksrevisionen, 2009, Tillämpningen av det finanspolitiska ramverket, Rapport 17, Stockholm.

Swedish Fiscal Policy Council, various years, Swedish Fiscal Policy, Stockholm.
Velfærdskommissionen (2006), Fremtiden velfærd – vores valg. Analyserapport, Copenhagen.

Swedish Ministry of Finance,2010, Utvidgad redovisning av bedömningen av finanspolitikens hållbarhet, Promemoria.

Swedish Ministry of Finance ,2011a, Ramverket för finanspolitiken, Regeringens skrivelse 2010/11:79.

Swedish Ministry of Finance, 2011b, Vårpropositionen, Stockholm

van der Ploeg, F. (2008), Structural reforms, public investment and the fiscal stance: a prudent approach
Studier i finanspolitik 2008/3, Swedish Fiscal Policy Council.

Economics Working Papers