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Generational Accounting - Quo Vadis?

Bernd Raffelhüschen

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This paper focuses on the problems involved in developing cross-country comparisons of the intergenerational stance of fiscal policy. Of course, these comparisons are nowadays based on the method of generational accounting and in particular most of them rely on comparing the total size of *intertemporal public liabilities* (IPLs). I first utilize the machinery of generational accounting in order to calculate the composition of the countries` IPLs, that is the sum of explicit and implicit liabilities embedded in the respective fiscal policies for several European countries and the United States. The findings suggest that the ranking in a cross-country comparison is very sensitive to a) the legal settings concerning social transfer adjustment over time, b) the degree to which *unreliable* or time-inconsistent reforms are taken into account, c) the respective countries` business cycle status in the base-year. The second aim of this paper is to outline recent and future applications of generational accounting. JEL Classification: E6, H6, J1

In most industrialized countries, issues concerning sound and sustainable finances are high on the political agenda. Ever-growing debt burdens induce rising interest payments and force politicians to economize on other spending items. There is also a clear and urgent need for a reform of the welfare state, since a rapidly aging population and rising unemployment impose increasing constraints on generous welfare programs. Traditional fiscal indicators based on cash-flow accounts fail to address aging phenomena because future liabilities of pay-as-you-go retirement and health care systems are absent from current fiscal flows. Hence, cash-flow deficits and the size of outstanding debt are unreliable as indicators of fiscal sustainability and the debt and deficit criteria for fiscal 'harmonization', such as those of the Maastricht treaty[1], may prove insufficient and shortsighted. In

* Corresponding Address: Institut für Finanzwissenschaft, Albert-Ludwigs-Universität Freiburg, Bertoldstrasse 17, D-79085 Freiburg, phone: +49-761-203-2354, fax: +49-761-203-2290, email: raffelhu@vwl.uni-freiburg.de.

1. The Maastricht criteria for qualifying as a member of the European Monetary Union (EMU) called for substantial fiscal consolidation with respect to both public sector budget deficits and the stock of outstanding public debt. Except under special circumstances, each prospective member country's budget deficit had to be below 3 percent of GDP and the public debt less than 60 percent by 1997.

fact, according to Kotlikoff (1992:p12) they are simply „number[s] in search of a concept".

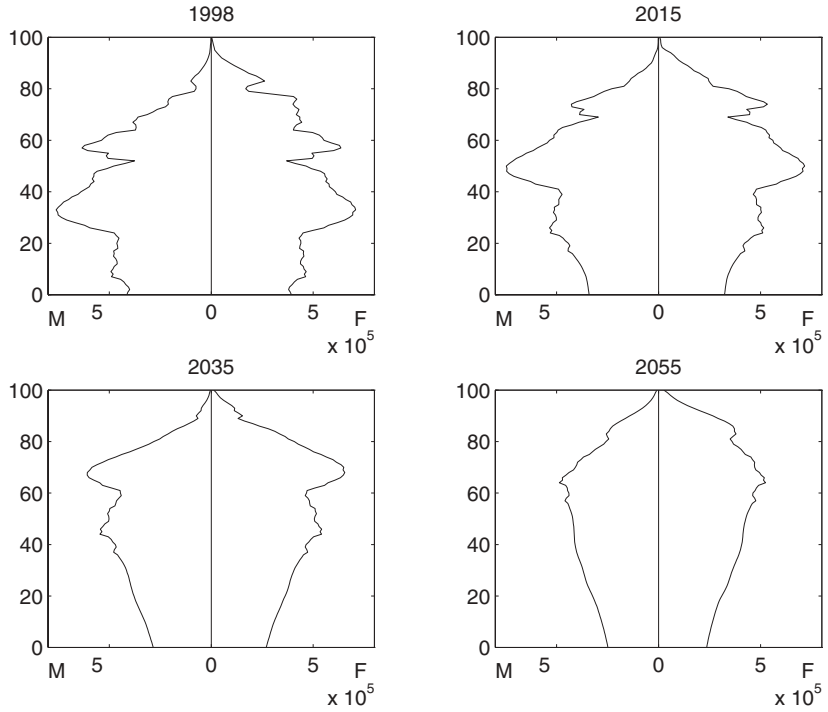
To judge the factual state of public finances, it is imperative to integrate the future demographic environment and its possible budgetary consequences within the legal and institutional settings of the country considered. In order to precisely specify the intertemporal stance of fiscal policy, Alan Auerbach, Jagadeesh Gokhale and Laurence Kotlikoff (1991, 1992, 1994) have developed in a series of articles an alternative measure of the intertemporal stance of current fiscal policy: The method of generational accounting. In short: Generational accounts do not focus on current annual cash-flows as does the traditional approach. Instead, they report for every generation alive the remaining net payments to the budget and distribute the resulting burden, or surplus, equally on all future generations. Since all expenditures and revenues are measured in present values, the intertemporal budget constraint of the public sector states that there is no free lunch, that is, expenditures have to be paid for either by present or by future generations. Generational accounts sensibly rely on intertemporal rather than annual measures of fiscal policy. It is exactly this long-term viewpoint, which distinguishes generational accounting from traditional annual budget accounting.

Ever since introduced in the early 90s, generational accounting has become a must in the toolbox of any applied economist. This paper uses the machinery of generational accounting in order to calculate and compare the composition of the total size of European and United States' *intertemporal public liabilities* (IPLs) – the sum of the explicit and implicit liabilities embedded in the national fiscal policies. Our analysis is restricted to the U.S., Iceland, Norway, Switzerland and twelve member states of the EU–Austria, Belgium, Denmark, Finland, France, Germany, Italy, Ireland, the Netherlands, Spain, Sweden, and the United Kingdom.[2] The findings suggest that present fiscal policies of all countries with the exception of Ireland have positive IPLs and, hence, are unsustainable in the long run. The quantitative findings are, however, not robust, that is, the ranking among the countries considered here is very sensitive to 1) the legal settings concerning the indexation of social transfers over time, 2) the degree to which *unreliable* or time-inconsistent reforms are taken into account, 3) the status of the business cycle in the respective countries.

The outline of the paper is as follows: As a point of departure, Section 2 reports and discusses the demographic trends in Europe and the United States. Section 3 provides a brief description of the method adopted for estimating IPLs. Section 4 reports IPLs for the 16 countries considered here and decomposes them between explicit and implicit liabilities. This is first done for the respective legal settings which were valid in the base-year 1995. In particular, the

2. Results for the United States are based upon Gokhale and Raffelhüschen (1999). For Norway and Switzerland, see Norwegian Ministry of Finance (1999) and Raffelhüschen and Borgmann (2001), respectively. The EU-studies were undertaken by a team of experts at the request of the European Commission`s Directorate General XXI (Task Force on Statutory Contributions). Cf. Keuschnigg et al (1999) for Austria, Dellis and Lüth (1999) for Belgium, Jensen and Raffelhüschen (1999) for Denmark, Feist et al (1999) for Finland, Crettez et al (1999) for France, Bonin et al (1999) for Germany, McCarthy and Bonin (1999) for Ireland, Franco and Sartor (1999) for Italy, Bovenberg and ter Rele (1999) for the Netherlands, Berenguer et al (1999) for Spain, Lundvik et al (1999) for Sweden, and Cardarelli and Sefton (1999) for the United Kingdom. These studies are downloadable from http://europa.eu.int/ comm/economy_finance/publications/european_economy/1999/eers0699en.pdf.

Figure 1.
A Typical Population Aging Process, Germany 1998–2055



countries vary in the indexation of transfers – some index to cost-of-living, others to wages, others have mixed systems. The section also contains the resulting IPLs derived under the assumption that 1) all transfers were indexed according to wage-growth and 2) time-inconsistent reforms were not taken into account. Section 5 concludes the paper.

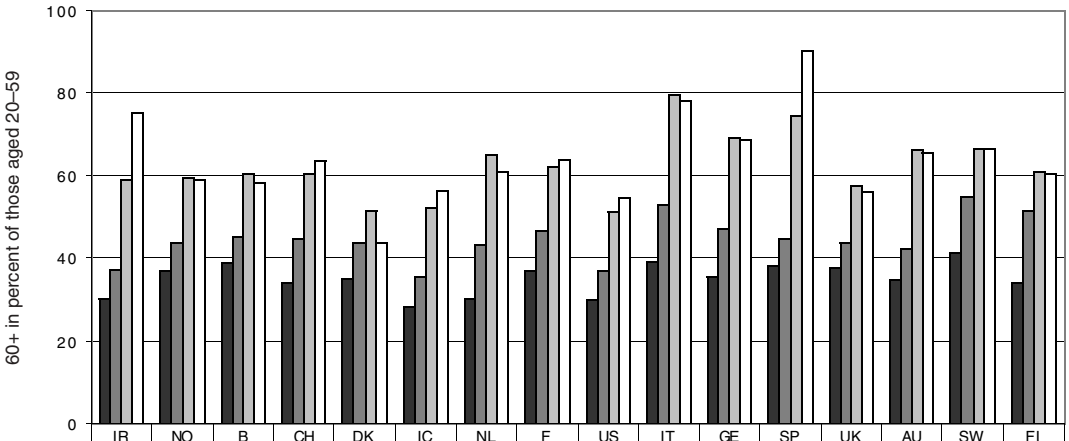
The Point of Departure: Demographic Trends in the Western World[3]

The driving force behind the implicit demands on future public budgets is the demographic transition underway in Europe and the United States. In general, all developed countries have one phenomenon in common: a significant "double aging" of the population. Because of the baby-boom and subsequent baby-bust during the postwar period and because of steady improvements in longevity, future populations in these countries will not only contain a greater proportion of elderly, but also a higher fraction of *older elderly* individuals. That is, general population aging will be accompanied by an aging of the elderly population itself.

Figure 1 illustrates this phenomenon as an example for the German population by reporting the respective cohort sizes of males and females in the years 1995, 2015, 2035

3. Sections 2 and 3 draw from Gokhale and Raffelhüschen (1999) and Raffelhüschen and Borgmann (2001).

Figure 2.
Elderly dependency ratio in a cross-country comparison (1995–2055)



	IR	NO	B	CH	DK	IC	NL	F	US	IT	GE	SP	UK	AU	SW	FI
1995	30,2	37,1	39,0	34,1	35,2	28,6	30,5	37,1	29,9	39,5	35,7	38,1	37,7	34,7	41,4	34,0
2015	37,5	43,8	45,3	45,0	44,0	35,5	43,6	46,9	37,1	53,0	47,3	45,1	43,8	42,3	54,9	51,7
2035	59,2	59,7	60,5	60,6	51,5	52,3	65,3	62,2	51,3	79,7	69,2	74,5	57,8	66,2	66,8	60,9
2055	75,1	59,0	58,5	63,8	43,9	56,5	61,0	64,1	54,8	78,4	68,8	90,4	56,2	65,5	66,5	60,6

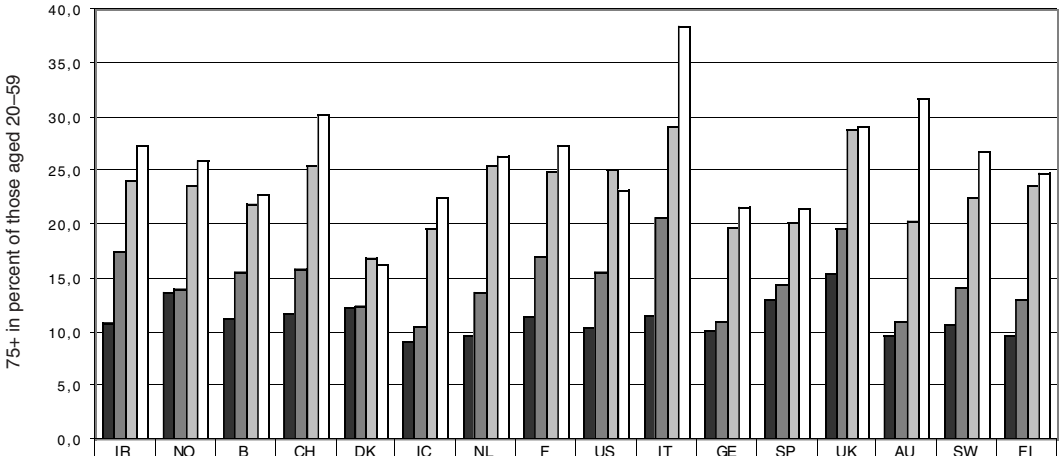
and 2055 in terms of the so-called population pyramid. Like in all other countries considered here, the shape of the present figure resembles rather some sort of Christmas tree than a pyramid. With a very high probability, this tree-shaped structure will evolve to the well-known mushroom form, indicating that in 2035, the aging process will be most dramatic, subsiding only in later years when the baby-boomer generations will have faded away.

The consequences for the elderly dependency ratio, that is, the ratio of the population aged 60 and older to that aged between 20 and 59 are tremendous.[4] Figure 2 shows how the ratio for the respective years 1995, 2015, 2035 and 2055 will increase if the most likely official population projections for the various countries will prove true. All countries are projected to experience a significant increase in their elderly dependency ratios over the next 15 years. The gain in the ratio is largest for Finland, but Sweden and Italy are prominent as countries that will experience the steepest increase in the size of the elderly relative to the working-aged population. By 2015, more than half of the populations of these three countries will be aged 60 or older. By contrast, the elderly dependency ratio will be at a modest 37 percent in the United States.

Population aging will continue in Europe

4. The cut-off age was chosen at 60 because this is the effective retirement age in public pension systems in most of the countries considered here.

Figure 3.
Oldest–old dependency ratio in a cross-country comparison (1995–2055)



	IR	NO	B	CH	DK	IC	NL	F	US	IT	GE	SP	UK	AU	SW	FI
1995	10,8	13,6	11,2	11,6	12,3	9,1	9,6	11,3	10,3	11,5	10,1	12,9	15,4	9,6	10,7	9,6
2015	17,4	13,9	15,6	15,8	12,4	10,5	13,7	17,0	15,6	20,6	10,9	14,4	19,5	10,9	14,1	12,9
2035	24,1	23,6	21,8	25,4	16,9	19,5	25,5	24,9	25,1	29,0	19,7	20,2	28,8	20,3	22,4	23,6
2055	27,4	25,9	22,7	30,2	16,2	22,4	26,4	27,4	23,1	38,4	21,6	21,5	29,0	31,6	26,7	24,8

well beyond the first two decades of the next century. In Italy, nearly four out of every nine persons will be aged 60 or older by 2035. In Sweden, Austria, and Germany, two of every five persons will be elderly according to the criterion used here. Again, the population in the United States will be relatively much younger with only one of every two persons in the elderly category. Except in Ireland and Spain, where elderly dependency ratios continue to rise beyond 2035, the process of population aging will cease after about five decades.

Population aging has two dimensions: Not only will there be more elderly individuals in the future, healthier lifestyles and medical advances will lead to an expanding population of the older old. Figure 3 shows dependency ratios for the oldest-old—the ratio of those aged 75 or more to those aged 20-59—for the years 1995, 2015, 2035 and 2055. This ratio is at or just over 10 percent for most of the countries considered here (the UK, at 15, is an exception). By 2035, this ratio is expected to roughly double for 12 of the 15 European countries considered here. By 2055, it almost triples for Ireland, Switzerland, the Netherlands, France, Austria, Sweden and Finland. The ratio more than triples for Italy: by 2055, roughly two out of every five Italians will be aged 75 or older. In the United States, this ratio is expected to increase through 2035, but then fall back slightly by 2055. Overall, the elderly dependency ratio will almost double in the next three decades and the oldest-old dependency ratio will close to triple by the middle of the next century.

Obviously, the double aging process is a discomforting but highly likely outlook. The impacts on the stance of fiscal policy are

captured with the help of the intertemporal public liabilities derived from national generational accounting studies. The particular method will be described in the following section.

Measuring Intertemporal Public Liabilities

While calculating the generational accounts as well as the IPLs, it is instructive to start with the government's intertemporal budget constraint. This constraint states that the government's future net taxes must be just sufficient to service or repay its net explicit debt. It can be expressed as:

$$(1)\quad \sum_{s=t}^{\infty} T_s R^{-(s-t)} - B_t = 0.$$

Here, B_t stands for the public sector's net explicit debt in the base year, t; T_s represents *actual* net taxes collected in future years indexed by s; and R=1+r represents a discount factor where the assumed interest rate is r. The term 'net taxes' is shorthand for 'unified primary budget surpluses:' It refers to aggregate public sector taxes less expenditures on non-interest transfers and purchases of goods and services. Actual future net taxes depend upon future fiscal policy changes. Hence, in general, actual future net taxes will differ from those that would be collected if the current set of fiscal policies were maintained indefinitely. The latter is denoted by the T^*_s. Equation 1 need not hold when T^*_s is substituted in place of T_s. If it does not, it is standard convention to consider current fiscal policy as being unsustainable: If the present value of net taxes exceeds B_t, fiscal policy would need to be changed to avoid a wasteful accumulation of resources with the government.[5] Alternatively, fiscal policy would have to be altered to avoid government debt default if the present value of net taxes falls short of B_t.

I will report the size of the intertemporal public liabilities (IPL) embedded in each countries existing fiscal policy.[6] This measure is defined by rewriting equation 1 as:

$$(2)\quad IPL_t = B_t - \sum_{s-t}^{\infty} T^*_s R^{-(s-t)}.$$

As is evident from equation 2, the value of IPL reflects both explicit and implicit government liabilities, the latter caused, for example, by generous pay-as-you-go retirement programs at a time of rapid population aging. The size of IPL also indicates the extent of policy adjustment necessary to restore fiscal sustainability: If positive, the government's total expenditure commitments (including interest payments on its explicit debt) exceed prospective revenues under status quo conditions and net taxes must be increased at some point in the future. If negative, the IPL indicates the extent to which taxes should be reduced.

Let us turn to the question of how to measure the IPLs. First, B_t is easily measured as the government's financial indebtedness less its tangible and financial assets.[7]

5. Note that the first term in equation 1 evaluates the present value of the stream of net taxes through the indefinite future.
6. In the literature, this indicator is also called "generational balance gap" or "true debt." See Raffelhüschen (1999a) for a broader discussion.
7. Intra-agency debt – that is liabilities of the government held in other government accounts – is not included in the calculation.

Measuring the second term on the right-hand-side of equation 2 is more difficult since it requires projections of future government taxes and expenditures under current policy. Reliable projections of taxes, transfers, and government purchases of goods and services are available for only a few of the countries analyzed here. Fortunately, generational accounts have been estimated for most European countries and for the United States. Its machinery offers a relatively straightforward way of projecting future government revenues and expenditures under prevailing fiscal policies.[8]

For those countries where projections of aggregate taxes, transfers, and government spending on goods and services are not available or are not reliable, these aggregates are project using a standard procedure. For each country, relative profiles of taxes and transfers by age and sex are available for the base year (1995). These profiles are obtained from micro-data surveys, one for each tax and transfer category in each country.[9] The available tax profiles cover all forms of statutory payments to the government and transfer profiles reflect both in-cash and in-kind benefits.[10] The relative-profile values for government purchases of goods and services are assumed to equal 1 for each age and sex because of the "public good" nature of these outlays.[11] Because they reflect the age- and sex-specific distribution of taxes, transfers, and purchases of goods and services across the population, the set of profiles for a given country constitute a detailed representation of the fiscal policy prevailing in that country during the base year.

Next, for each country, aggregate taxes, transfers, and government purchases in the base year (at all levels of government-federal, state, and local) are distributed among individuals alive in that year according to the corresponding age-sex relative profiles. This procedure yields per capita taxes, transfers, and government purchases for the base year. For future years, profiles of per capita taxes, transfers, and government purchases are obtained by applying an assumed long-run growth factor of 1.5 percent per year to the base year's per capita profiles. Let $h^{*x}_{a,i,t}$ represent the i^{th} type of tax per capita for a person of sex x aged a in year t. Then, the i^{th} per capita tax in year s>t is calculated as:

$$(3) \quad h^{*x}_{a,i,s} = h^{*x}_{a,i,t}(1 + g)^{s-t}.$$

The same growth factor is used for every country included in this study. Appropriate modifications are made to future per capita values in those cases where recent fiscal policy changes imply future changes in the distribution of taxes or transfers by age and sex. Next, for each country, two profiles of per capita net taxes – taxes net of transfers

8. For a brief description of generational accounting see Auerbach, Gokhale and Kotlikoff (1991, 1992, 1994). The method employed in this paper follows the standards developed in the European Commission's project *Generational Accounting in Europe.* Cf Raffelhüschen (1999b,c).
9. See the references mentioned in footnote 2.
10. All available information was used to derive age-sex profiles for the various types of taxes and transfers. Whenever there was insufficient information to distinguish payments by age or sex, the base-year aggregate amount is distributed equally by age and sex.
11. For some countries, such as the United States, government purchases on goods and services are distributed according to a few age-sex categories. However, the part of government spending that represents purchases of pure public goods – such as defense – is distributed uniformly across the living population.

and net of government purchases of goods and services – are computed (one for each sex) for each future year s:

$$(4) \quad \eta^{*x}_{a,s} = \sum_i h^{*x}_{a,i,s}.$$

Finally, aggregate taxes net of transfers and net of purchases of goods and services for future years are computed as:

$$(5) \quad T^{*}_{s} = \sum_x \sum_{a=0}^{D} \eta^{*x}_{a,s} P^{x}_{a,s}.$$

In equation (5), $P^{x}_{a,s}$ stands for the number of individuals of sex x aged a in year s. Country specific population projections based on assumptions on mortality, fertility, and immigration consistent with those of official medium-term estimates of future demographic trends were employed in the calculations.[12]

For countries where reliable long-term projections are not available, the country authors use the method described above to obtain future aggregate taxes, transfers and government spending. For others, such as United States, where reliable medium and long-term projections are available from official government agencies, we use the method described above to extend the projections beyond the last year available. The projections are extended sufficiently far out into the future so that adding more years makes no appreciable difference to present value calculations – that is, until the second term on the right-hand-side of equation 2 has converged.

Cross-country Findings

Cross-country studies require a broad common platform to maintain comparability. On a first glance, this concerns a range of assumptions concerning 1) the discount rate, 2) the future economic development, 3) the underlying demographic trends for the future, etc. Taking a closer look, the harmonization of these assumptions is by far not sufficient. A more sophisticated platform to be defined is the proper way of finding a common ground for what is subsumed under the heading base-case fiscal policy. In general, everything that has been passed into law in a country is part of the present fiscal policy and should be considered. But does that also mean to include reform proposals, like severe pension cuts, which concern only the distant future and which are very likely to be withdrawn even before their impacts would occur? Or what about medium term projections of the fiscal authorities representing more a *wishful thought* than reality? In the findings to be presented subsequently for the 16 countries considered here, more than 30 national experts decided about these issues autonomously according to their own judgment. Whether these stand more for best guesstimates or fairly good estimates remains to be seen but every cross-country study hitherto done relies on exactly this co-ordination process.[13]

Another more sophisticated standardization is required when it comes to the treatment of future growth in transfers. Some of the countries considered here adjust their pension payments, welfare money etc. with a pure cost-of-living or consumer price index, others index transfers to a certain degree to

12. For the country-specific data sources, see the references listed in footnote 2.
13. Cf. Auerbach, Kotlikoff and Leibfritz (1999), Kotlikoff and Raffelhüschen (1999), Raffelhüschen (1999b), Gokhale and Raffelhüschen (1999) and European Commission (1999).

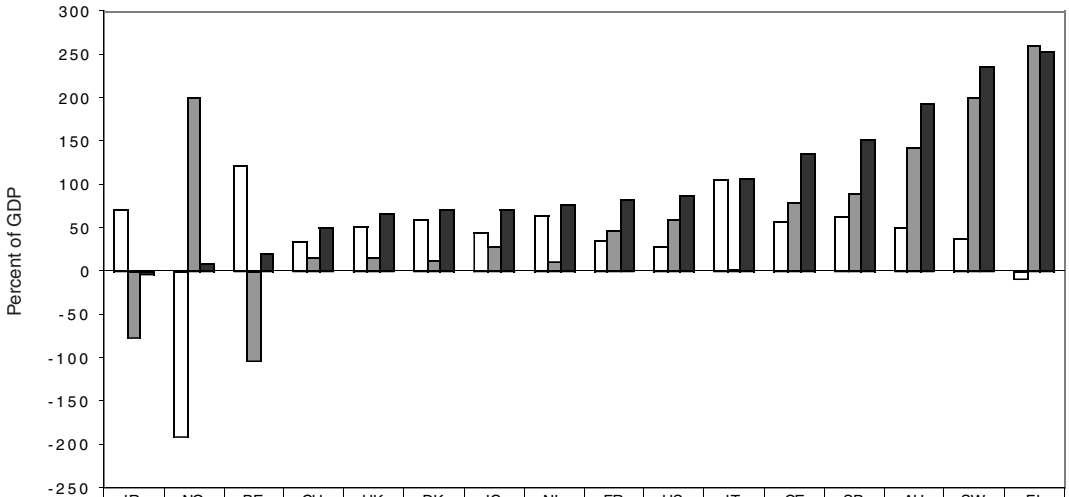
the growth rate of net or even gross wages. A typical representative of the first type is the Beveragian approach of the UK while the Bismarckian approach in Germany might stand for the second type of indexation. Of course there are also mixed strategies like in Switzerland where pensions are adjusted by an index halfway between the aforementioned extremes. To make things even worse, some countries have wage indexation in some transfers and cost-of-living indexation in others.

There is, however, a huge gap between the legal setting and the effective indexation of transfers over time. To see this, note that pure cost-of-living adjustment would eventually result in a poor minimal standard of income. In fact, imagining this for a period spanning over the last hundred years, welfare money would have a purchasing power sufficient for subsistence in line of what was the standard in 1900. On the other hand, wage-growth indexation has always been deferred in times of poor economic performance in the Bismarckian systems. As in most cases, the truth lies somewhere in between, but where exactly? In order to avoid an arbitrary reference point, cross-country comparisons so far have chosen two different ways of standardization. Auerbach, Kotlikoff and Leibfritz (1999) as well as Kotlikoff and Raffelhüschen (1999) defined the current law as the point of departure, that is, the numbers for each country are based on different types of transfer adjustments. In contrast, Raffelhüschen (1999b), Gokhale and Raffelhüschen (1999) and the European Commission (1999) standardized the national studies to a net wage index, which was in some cases against current law.

Subsequently, we will illustrate the differences in the transfer indexation as well as the aforementioned definitions of the present fiscal policy by focusing on two different scenarios: Figure 4 shows country-specific IPLs under current law while Figure 5 reports the IPLs assuming that all transfers are indexed to GDP growth and too *unrealistic* reforms would not be administrated in the future, that is, when their effects would be sensible for future voters. The countries in Figure 4 (and earlier figures) are sorted in ascending order according to their total IPLs as of 1995. The figure also shows the magnitudes of explicit liabilities (public sector net outstanding debt in 1995) and implicit liabilities calculated according to the method described earlier.

The ascending order starts with Ireland, which even accumulates a small intertemporal wealth amounting to 4.3 percent of GDP, and runs the way to Finland whose intertemporal liabilities amount to a sky-rocketing 250 percent of GDP. In fact, the overall European perspective is one of severe intertemporal fiscal imbalance with the notable exception of Ireland, Norway and Belgium. I will start to comment on these countries. Despite Ireland`s relatively significant population aging and high level of explicit debt, the country`s 1995 fiscal policies generate a surplus of future net taxes relative to non-interest expenditures, which is more than sufficient to repay the explicit debt. To a certain degree the tremendous implicit surpluses are due to the rather late population aging. Just the opposite holds true for Norway. As an archetypal Scandinavian welfare state the 1995 fiscal policy generates huge implicit liabilities. However, the value of Norway's rich petroleum reserves, which are to an overwhelming fraction controlled by the government, reaches almost the same amount of twice the 1995-GDP. Also Belgium has surprisingly low IPLs although its explicit debt is the highest among the countries covered by this study. It is exactly the urgent need to cut back this explicit debt,

Figure 4.
Composition of the IPLs in a cross-country comparision (1995), indexation of transfers according to legal atatus quo



	IR	NO	BE	CH	UK	DK	IC	NL	FR	US	IT	GE	SP	AU	SW	FI
explicit	72	-191	122	34	51	60	44	65	36	29	106	58	63	50	37	-8
implicit	-76	200	-103	16	16	12	28	11	46	59	1	78	89	143	200	262
true debt	-4	10	19	50	67	71	72	76	81	87	107	136	152	193	237	253

which induced Belgian governments already since the early 1980s to reduce expenditures and increase taxes even more dramatically. As a result, the primary surplus increased to almost 6 percent of GDP in the late 1990s, which explains the high implicit assets.[14]

Already the country ranking fourth, Switzerland, is burdened by total public liabilities as high as 50 percent of GDP. Nevertheless, since only 16 percentage points are implicit liabilities, also Switzerland can be seen as being close to a sound though not really sustainable fiscal policy. The UK, Denmark, Iceland, and the Netherlands resemble Switzerland closely with total numbers ranging between 67 and 76 percent of the respective GDP. Moreover, all of them display similar low implicit liabilities with the major part of the total being due to ever-increasing explicit debt figures. The similarities in the implicit liabilities can only be explained by the very similar Beverage approach to social policy, that is, the combination of relatively generous minimum standards with not too generous and partially means-tested supplementary welfare systems.

While in the latter cases one still might be in doubt whether these countries can be said to have achieved sound public finances in the long run, these doubts will definitely not be valid for France and the United States with high but moderate 1995-IPLs of 81 and 87

14. Of course, the intention of the Belgian government have been fairly straightforward: Knowing that the Maastricht treaty's debt/GDP criterion of 60 percent by 1997 was out of reach, the government sought to reduce the annual deficit to well below the 3 percent threshold in order to overfill the deficit criterion.

percent of GDP. In terms of total IPL, France is approximately in the middle of the group of the countries considered here with approximately even explicit and implicit shares of the total. The United States rank slightly higher, that is, despite a low explicit debt/GDP ratio, its IPL/GDP ratio is almost 100 percent because of relatively high implicit liabilities.

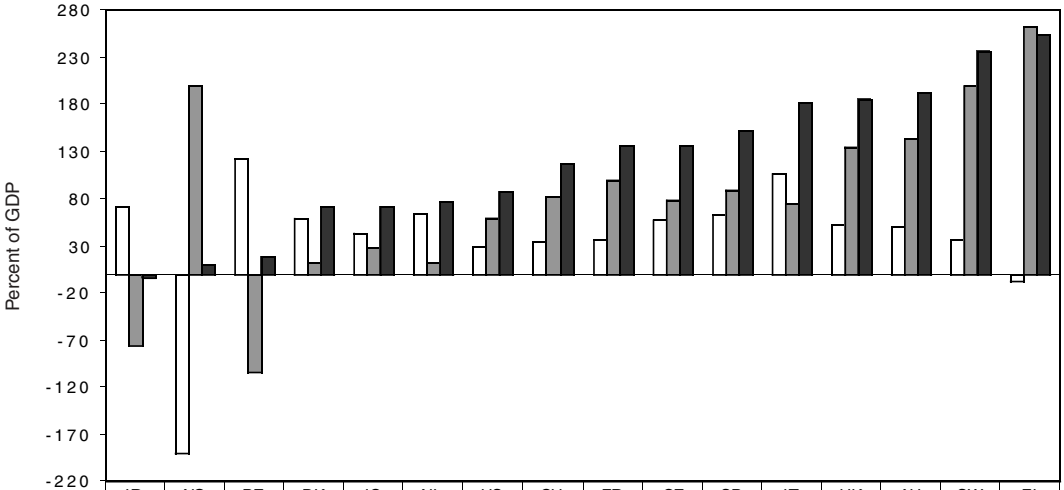
Italy and Germany range next and their true debt figures exceed the 100 percent level with figures of 107 and 136 percent of GDP, respectively. We will later comment on the Italian case with an unexpected low implicit debt of just 1 percent of GDP while in the German case, we find that the Union´s single largest economy represents approximately the average intertemporal indebtedness in the EU. For Spain and Austria, we find a value of total IPLs well over 150 percent of GDP. In both cases, we find on top of already high explicit debt figures even higher implicit ones stemming from both a significant aging process and generous pension systems. In Sweden and Finland, we find sky-rocking high IPLs which amount to over 200 percent of the countries' GDP. This is despite the fact that Sweden has a rather low explicit debt figure while Finland has even explicit assets of about 8 percent of GDP. Nevertheless, in the Swedish case we find a Scandinavian welfare state alike Norway but without petroleum wealth.

Both countries are very interesting also due to other facts, which are closely related to the base-year 1995. Sweden was on the way of preparing major tax and pension reforms in order to adjust to internal EU settings. In fact, taking into account these reforms meanwhile passed into law, Sweden would range somewhere in the middle of the countries considered here. Moreover, taking the medium-term budget projections into account, Sweden would be very close to the Danish figures as was pointed out in the study of Hagemann and John (1999). In the EU study, however, no medium term budget projection was taken into account since in most cases, these numbers could not be seen as realistic. From a hind-sight perspective this was not the case for Sweden, which together with Denmark projected budget surpluses already by the end of the 1990s.

Finland makes a strong case for research to be made in the future. As pointed out by the contribution of Vanne (2001), the substantial imbalance is to a large extent a result of the exceptional unfavorable state of the business cycle of the base year. In fact, since the exports into the Comecon countries basically collapsed, the base-year displayed exceptionally high unemployment rates combined with high transfer expenditures and low tax revenues. In the aftermath Finland had record high growth rates and by today, Finland´s stance of fiscal policy might be one of the soundest in Europe. All this is partially due to changes in fiscal policy through proper reforms, but to an overwhelming part it is simply due to business cycle effects. Obviously, serious efforts have to be made in the future to control for unsynchronized business cycle effects while comparing different countries' generational accounting results.

As already mentioned, Figure 5 reports all IPLs under the assumption that all transfers are indexed by GDP growth and too *unrealistic* reforms would not be administrated in the future. As in Figure 4, the countries are sorted in ascending order according to their total IPLs as of 1995. For Switzerland, the UK and France we find significantly higher implicit liabilities. The difference in total IPLs is highest for the UK and corresponds to an increase of nearly a full GDP. How can this surprising divergence be explained? Under current law, the UK provide for annual benefit up-rating with prices,

Figure 5.
Composition of the IPLs in a cross-country comparision (1995), indexation of transfers according to growth of wages



	IR	NO	BE	DK	IC	NL	US	CH	FR	GE	SP	IT	UK	AU	SW	FI
explicit	72	-191	122	60	44	65	29	34	36	58	63	106	51	50	37	-8
implicit	-76	200	-103	12	28	11	59	83	100	78	89	75	134	143	200	262
true debt	-4	10	19	71	72	76	87	117	136	136	152	181	185	193	237	253

rather than nominal indexation to wages. This strategy implies a gradual reduction in transfer levels relative to earnings. Given real productivity growth reaches the assumed 1.5 percent, indexing public spending with consumer prices until years 2000, 2015 and 2030 implies a relative transfer cut by 7.2, 25.8 and 40.6 percent, respectively. This is what makes the UK figure as low as 67 percent under the current law regime. But is a transfer cut of more than 40 percent time-consistent or will there be a more generous government at some point of time in the future? The answer remains to be seen. Nonetheless, if for reasons of comparability the UK indexed transfers to GDP growth, implicit liabilities would be one of the highest in Europe.

Still, on first glance, little in the UK would hint at this severe intertemporal imbalance and in fact, the aging process in the UK is one of the least pronounced in Europe (Cf. Figures 2 and 3). Nevertheless, the counter-intuitive results can be explained very straightforwardly. First, aging in the UK starts earlier than in the rest of Europe, which aggravates the financial problem. The transfer pension system appears to be generally under-funded since in 1995, the UK tax quota (38.3 percent of GDP) was the third lowest in the EU. The scant tax base in the UK fails to generate sufficient revenue, as soon as the number of taxpayers begins to fall and the number of pensioners begins to rise.[15]

As mentioned above, Switzerland and

15. For a broader discussion of the UK, cf Cardarelli and Sefton (1999) and Bonin and Raffelhüschen (2000).

France are the other two countries, in which the current law does not imply a wage indexation of transfer schemes. In both cases, implicit liabilities would be about half a GDP higher if all transfers would grow in line with the underlying GDP growth rate of 1.5 percent. Why are the figures so much lower than in the case of the UK? Also here, the answer is straightforward: Under current law, Switzerland adjusts most welfare payments, among them the basic pension, according to a mixed index that combines wage and consumer price indexation in equal shares. In the case of France, the 1993 pension reform indexed pension benefits to consumer prices instead of wages to pension schemes for private sector employees. This obviously was already an important though not sufficient move towards intergenerational balance.

From the comparison of the cross-country results under current law and under a uniform GDP indexation, it should be clear that the ranking of the countries' IPLs crucially depends on what is the underlying assumption. In general, Beverage systems like Switzerland, the UK, Denmark or the Netherlands fare better in cross-country comparisons since they are typically not very generous and the benefits are adjusted to consumer prices. Nevertheless, these systems adjust in discrete acts of generosity for the otherwise hidden cuts in relative purchasing power. When calculating the IPLs in such a period, the stance of fiscal policy is, of course, much worse than measured in periods when expenditure dynamics are slowed down. In 1995, obviously, public budgets have been under tight control.

Bismarckian approaches to social protection are, in general, systems which insure relative income during retirement and other periods of need by a high tax-benefit-linkage. Moreover, they are usually indexed according to gross or net wage growth. As a result, their financial stance is much less protected against population aging as compared to Beverage systems and hence, they fare worse when doing cross-country comparisons under the current law. This can be seen from directly comparing for example Germany and the UK in Figures 4 and 5. However, Bismarckian systems tend to react by suspending the wage indexation or cutting back replacement rates whenever further growing contribution rates seem politically inappropriate. Also this is a kind of discrete adjustment. As a matter of fact, the two types of social protection systems do converge in the long run. Nevertheless, as compared to discrete benefit cuts, discrete generosity seems to be superior from a public choice viewpoint.

Another problem in cross country comparisons concerns the likelihood that a reform proposing benefit cuts proves to be time-inconsistent after having been passed into law. Italy is a good example for this. To alleviate the aging pressure on the public pension system Italian governments enacted two reforms in the first half of the 1990s: the 1992 "Amato reform" and the 1995 "Dini reform" both inducing severe cuts in the replacement rates of public pensions. By comparing the numbers in Figure 4 and 5, the Italian IPL would amount to 181 percent instead of 107 if the reforms had not been enacted [cf. Franco and Sartor (1999)]. Whether the benefit cuts will turn out to be viable remains to be seen, the tremendous impact on the ranking of the IPLs is obvious.

Conclusion

Throughout the Western World, there is a clear and present need to reform the welfare state since an aging population, rising unemployment rates and the lack of competitiveness in a globalized world economy are imposing more and more constraints on

national welfare programs. At the same time, growing debt burdens induce high interest payments that also call the sustainability of present fiscal policy fundamentally into question and force public decision makers to economize on other spending items and/or to increase the already high tax loads.

This paper investigates the demographic transition and its impact on the intergenerational stance of current fiscal policy with the help of generational accounting. We use the machinery of generational accounting in order to calculate and compare the composition of the total size of European and United States' intertemporal public liabilities (IPLs) – the sum of the explicit and implicit liabilities embedded in the national fiscal policies. Considering the United States, Norway, Switzerland, Iceland and twelve member states of the EU – Austria, Belgium, Denmark, Finland, France, Germany, Italy, Ireland, the Netherlands, Spain, Sweden, and the United Kingdom, we find that 1995 fiscal policies of all countries with the exception of Ireland have positive IPLs and, hence, are unsustainable over the long-term.

Calculating the results under the legal status quo of 1995, the intergenerational imbalance indicated by the sheer magnitude of the IPLs is highest in Finland and Sweden, where the current government policies shift an IPL/GDP ratio of over 200 percent of GDP to future Finns and Swedes. In Austria, Spain, Germany and Italy the generational imbalance is also extreme with IPLs ranging between 193 and 107 percent of GDP. A lower but still severe imbalance can be found in the United States, France, the Netherlands, Iceland, Denmark and the UK. Here we find intertemporal liabilities between 87 and 67 percent. Finally, minor IPLs can be found in Switzerland (50 percent), Belgium (19 percent) and Norway (10 percent).

The quantitative findings are, however, not robust, that is, the ranking among the countries considered is very sensitive to 1) the legal settings concerning the transfer indexation over time, 2) the degree to which unreliable or time-inconsistent reforms are taken into account, 3) the status of the business cycle in the respective countries.

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