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A Generational Accounting Perspective on Fiscal Policy and Labour Market Trends in Spain

Holger Bonin
Gemma Abio
Eduardo Berenguer
Joan Gil
Concepció Patxot

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Forschungsinstitut
zur Zukunft der Arbeit
Institute for the Study
of Labor

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Holger Bonin
Universität Bonn und IZA, Bonn

Gemma Abío
Universitat de Barcelona

Eduard Berenguer
Universitat de Barcelona

Joan Gil
Universitat de Barcelona

Concepció Patxot
Universitat de Barcelona

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IZA

P.O. Box 7240
D-53072 Bonn
Germany

Tel.: +49-228-3894-0
Fax: +49-228-3894-210
Email: iza@iza.org

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ABSTRACT

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According to the 2001 Spanish budgetary previsions, the government deficit is about to disappear. We analyse this matter within a generational accounting framework. Accounting for the recent expansive phase of the economic cycle, we find that current fiscal policy is also intertemporally balanced provided that the favourable present employment situation lasts. However, public finances remain under the pressure of the demographic cycle. Therefore, to achieve fiscal sustainability, the surpluses predicted for the next decades need to be accumulated, in order to finance deficits appearing during the baby-boomers' retirement.

The improvement of employment has played an important role in this situation. We extend the standard generational accounting methodology incorporating tax and transfer age profiles by employment status. This permits us to analyse the possible intertemporal impact of several future employment developments. In particular, we assess the fiscal effects of an expected future increase in female labour force participation. We show that this trend does not necessarily improve the intertemporal government budget, as social insurance in Spain is not actuarially fair. Finally, we also assess the impact of a decline in unemployment to the natural rate of unemployment.

JEL Classification: E62, H55

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Holger Bonin
Institut zur Zukunft der Arbeit
P.O. Box 7240
D-53072 Bonn
Germany
Tel.: +49 228 38 94 303
Fax: +49 228 38 94 510
Email: bonin@iza.org

1. Introduction

It seems that the state of government finances in Spain has improved considerably in recent years. By the end of 2000, the overall public deficit, which had reached a disturbing 6.6 percent of GDP in 1995, has fallen to an estimated 0.4 percent of GDP, and public revenue and spending are predicted to be in balance in 2001. Government forecasts even predict small budget surpluses for the years to come, amounting to 0.1 and 0.2 percent of GDP in 2002 and 2003, respectively. The perspective of budget surpluses is quite unusual for modern Spain. Ever since 1974, the public sector has been in deficit, accumulating liabilities that reached, in 1999, 63.5 percent of GDP. Spain thus failed to meet one of the convergence targets set for membership in the European Monetary Union, although public debt was still below the average of EU member states.

The rapid decline of public deficits in Spain has been ascribed to a lucky combination of fiscal reforms, including the attempt at lowering personal income tax rates, and improving economic conditions as the country went through the expansive phase of the business cycle. In particular, the favourable economic environment, together with a number of structural reforms on the labour market, greatly improved employment opportunities. Unemployment rates decreased from 22.2 percent in 1996 to 15.9 percent in 1999. Accordingly, tax revenue of the public sector has increased while transfer spending has fallen.

Although the economic upturn has certainly impacted favourably on government finances, one should not easily conclude that public sector deficits would now be under control permanently. In Spain, where fertility rates have ranked among the world's lowest for two decades, the demographic transition to higher old-age dependency could impose particularly severe pressure on government budgets in the longer term. With a diminished ratio of tax payers to economically inactive transfer recipients, spending obligations of the government do increase just when the revenue base is expected to deteriorate. The *demographic cycle* of public finances induced by the strong life cycle component of individuals' tax payments and benefit receipts will affect in particular the contributive social security system, which at present, after

financial rationalisation promoted by the 1997 Pension Reform Act, is exhibiting a surplus.

Hence, in face of demographic aging, the proper perspective on the possibility of budget surpluses ahead is to ask whether assets accumulating in the consequence could actually be sufficient to keep the government solvent when the financial situation is worsening due to population aging. Investigation of this problem requires a tool for long-term oriented fiscal policy analysis. This paper applies the intertemporal budgeting concept of generational accounting, suggested by Auerbach et al. (1991, 1992). This method, based on the financing constraint of a government that cannot adhere to a Ponzi-strategy indefinitely, is perfectly suited for our purpose. By constructing generational accounts, one can reveal the aggregate deficit or surplus associated with continuation of current fiscal legislation, which provides an immediate indicator for whether present primary surpluses would offset future primary deficits.

In many respect, the present study continues work by Berenguer et al. (1999) who provided a first application of generational accounting to Spain, to study the long-term sustainability of public sector budgets from the perspective of 1995. This analysis is expanded here in a number of directions. First, we provide an overdue update of the generational accounts, considering the fast fiscal improvement unexpected at the time of the earlier study. In some sense, then, our paper could also be read as a contribution to the latent debate among generational accountants about how the method is affected by the business cycle.

Secondly, we have substantially improved upon the micro data set fundamental to the sustainability measures of generational accounting. In particular, we have derived a unique new set of age profiles measuring tax and transfer payments by employment status. This permits us, for the first time in generational accounting, to our knowledge, to reliably evaluate the impact of labour market developments, like rising labour force participation, on fiscal sustainability. Finally, we have tried to reconcile the usually separated worlds of generational and conventional budget accounting, by explicitly decomposing the intertemporal budget imbalance at the core of generational accounting into a sequence of annual primary budget imbalances.

The paper is composed as follows. In the next section, we briefly explain the fundamentals of the generational accounting framework. Section 3 then summarises the demographic and fiscal data underlying the empirical application of the method to public sector finances in Spain. Section 4 explores the sustainability of the current *status quo* of fiscal legislation, whereas Section 5 reveals the business cycle impact on the sustainability outcome. In Section 6, we discuss the possible effects of labour market changes, in particular changes in labour force participation and unemployment levels, on long-term fiscal balance. Section 7 concludes.

2. The Method of Generational Accounting

If one accepts the life-cycle hypothesis of rational individual decision making, agents react to government policy considering its impact on their remaining lifetime resources. Short-term indicators of fiscal activity, like the annual government deficit or surplus, then fail to indicate whether fiscal policy is expansive or restrictive. Furthermore short-term deficit measures, while suitable for budget execution and planning, neglect that much public revenue and spending has a demographic dependency that dynamically compromises government behaviour. Therefore, they cannot be used to evaluate the sustainability of public finances in a changing demographic environment.

These shortcomings of conventional deficit budgeting led to the proposal of generational accounting, which has by now become a standard tool to evaluate the long-term impact of government fiscal performance[1]. The method starts from the notion that, to remain solvent with a given level of historical debt, the government cannot pursue a Ponzi-strategy –serving liabilities by issuing new bonds– indefinitely[2]. As a consequence, the present value of future primary surpluses must be sufficiently

[1] Collected volumes of empirical applications to specific countries are European Commission (1999) and Auerbach et al. (1999). Critical appraisals of generational accounting can be found in the introductory chapters of these volumes, as well as in Buiter (1997), Havemann (1994) and Diamond (1994).

[2] We limit the presentation to the basic principles of generational accounting. See Bonin (2001) for a comprehensive description of the method.

large to redeem historical debt. In technical terms, looking forward from period *t*, the intertemporal financing constraint of the government can be written as

$$\sum_{y=t}^{\infty} T_y (1+r)^{t-y} - B_t = 0 \,, \tag{1}$$

where T_y stands for the primary surplus in period *y*, which is taken back to period *t* at a time-invariant annual rate *r*, and B_t represents the level of government debt in period *t*.

Quite intuitively, one may test the sustainability of current fiscal policy by inspecting the corresponding time path of primary deficits. As soon as continuation of revenue and spending levels violates the intertemporal financing constraint (1), fiscal policy is not sustainable. In particular, if the aggregate primary government surplus is smaller than the initial debt, the government eventually becomes insolvent as debt will accumulate at an ever-faster rate. At some point of time, therefore, public revenue must be increased (or spending reduced), in order to balance primary surpluses and base year debt. In economic terms, the difference between base year debt and aggregate primary surpluses represents an –implicit– intertemporal liability of the government, known in generational accounting as *sustainability gap*.

Since envisaged tax and transfer levels cannot be sustained, policies inconsistent with the intertemporal budget constraint lead to redistribution across generations. Stressing this distributional impact, generational accountants derive the sustainability gap on the base of estimated life-cycle net tax payments by generation corresponding to a given fiscal policy. The aggregate primary surplus is computed according to

$$\sum_{y=t}^{\infty} T_y (1+r)^{t-y} = \sum_{k=t-D}^{t} P_{k,t}\, GA_k \;+\; \sum_{k=t+1}^{\infty} P_{k,k}\, GA_k \,, \tag{2}$$

where $P_{k,t}$ is the size of a generation born in period *k* and alive in period *t*, and GA_k denotes the aggregate future net tax payments upon death –in present value terms of period *t*– of a representative member of generation *k*, termed the *generational account* of cohort *k*[3]. The generational accounts are evaluated on the base of the projected

[3] For notational ease, equation (2) assumes no migration. However, the modifications necessary to deal with migration, as developed by Bonin et al. (2000), are fully incorporated in our computations.

average tax and transfer payments fiscal legislation allocates to members of specific age cohorts, in combination with individual mortality rates.

With individuals' maximum lifetime represented by *D*, the first RHS-term of equation (2) adds up the net taxes paid by the current population. As the generational accounts are forward-looking, living cohorts do not enter the analysis with their entire life-cycle. The second RHS-term is the sum of net tax payments by cohorts born in the future. In the generational accounting context, net taxes are understood as taxes paid net of transfers received in cash or in kind, where the latter include government purchases of goods and services, which are assigned uniformly on a per capita basis.

How politics would react to balance a sustainability gap is obviously unknown to the analyst. Thus, generational accountants by convention rely on a counterfactual experiment. They assume that generations born after period *t* will face a uniform proportional change in their tax payments under the initial fiscal policy. This stylised proceeding allows illustrating intertemporal fiscal imbalance by the difference in lifetime net tax burdens of base year and future cohort representatives –either traced over the entire life-cycle. If the time path of primary deficits were sustainable, the generational accounts, corrected for income growth, would be identical. Unsustainable fiscal policy, in contrast, is also generationally imbalanced. Different lifetime fiscal burdens must be imposed on future generations and on current newborns.

3. Baseline Assumptions and Parameter Estimates

The computation of the sustainability gap for the entire public sector budget in Spain, incorporating all government levels and social insurance programs, requires a very long-term demographic forecast that determines future cohort size and age- and generation-specific individual mortality rates, and projections of per capita tax and transfer payments by age and generation. Our projections start from year 1996.

Regarding demographics, we have taken the historical 1996 levels of individual mortality and fertility for a starting point, and then broadly followed the demographic hypotheses adopted by Fernández-Cordon (2000)[4]. To be specific, the population

[4] The generational accounting results, of course, depend on the underlying demographic assumptions. We therefore performed a sensitivity analysis testing for the impact of lower fertility and a constant

projection accounts for a –progressively decelerating– increase in individual survival probabilities until 2050. By then, compatible with recent evidence, life-expectancy at birth will have made a gain of about five years, reaching 78.5 years and 85.0 years for males and females, respectively. Total fertility is assumed to recover linearly from the very low 1996 rate of 1.13 to a level of 1.72 by 2021, and to stay constant thereafter. Our demographic projection predicts old-age dependency –defined as the number of persons aged 65 and above per cent of persons aged 20 to 64– to jump from 25.5 in 1996 to a maximum of 68.2 in 2050. In the long term, due to fertility rates remaining below replacement level and the increase in life-expectancy, the dependency ratio converges to 51, doubling its current value. Immigration, which in our baseline projection is set to a constant influx of 30,000 net migrants per year, is not sufficient to stabilize the dependency ratio.

The most critical part of generational accounting concerns the construction of profiles describing how fiscal legislation assigns individual claims and liabilities against the public sector to specific age groups. To break down aggregate budget figures according to their age distribution, we have adapted the usual three-stage procedure employed by generational accountants.

First, a set of cross-sectional profiles was estimated from micro data indicating the relative fiscal position by age of the current population. Altogether, we constructed age profiles for ten types of taxes and fourteen types of transfers, mostly on the base of the 1996 Continuous Family Budget Survey.[5] In addition we used statistical sources provided by the Social Security administration and the Ministry of Education, and occasionally relied on indirect evidence. If possible, benefit entitlements and tax liabilities were distinguished not only by age, but also by gender and current employment status, i.e., employment, unemployment or non-participation. The use of participation-specific age profiles is a notable improvement over previous generational accounting studies. It is a prerequisite to appropriately design the impact of changes in

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labour force through endogenous entry of migrants. The results indicate that the qualitative findings presented in the paper are satisfactorily robust for a reasonable range of demographic developments.

[5] The *Encuesta Contínua de Presupuestos Familiares* (ECPF) is conducted by the *Instituto Nacional de Estadística* (INE).

labour market conditions on the generational accounts, as is done repeatedly in our calculations. Further details on the construction of tax and transfer profiles by age, including a discussion of our main assumptions and our approach to fiscal incidence, can be found in an appendix.

In a second step correcting for deficiencies in the micro data, we benchmarked all tax and transfer profiles against the corresponding macro aggregates of year 1996, taking into account the age composition of the population. The overall public sector budget employed at this stage is shown in Table 1. Note that not all of the reported figures are immediately comparable with the financial statistics from which the budget data were originally drawn. To avoid multiple accounting of budget positions, some items were corrected for intergovernmental transfers. Moreover, the reported aggregates usually had to be reclassified, in order to fit the specific micro profiles. Among government purchases, we only treated spending on health –including social health transfers– and education as dependent on age. The remaining government purchases, net of revenue that we could not reliably assign to specific cohorts, were allocated as a uniform personal transfer across all cohorts, in line with generational accounting conventions.

The micro profiles reflect the cross-sectional impact of fiscal legislation for a particular base period –the year 1996– while generational accounts take a longitudinal perspective over different periods. Generational accountants, in a final step, usually solve this problem by subjecting the set of initial cohort tax and transfer profiles to a uniform, time-invariant growth rate measuring labour productivity growth. Applied strictly, this procedure, for a benchmark, maintains the relative current incidence of fiscal policy by age indefinitely.

Our projection generally follows this *status quo* approach. More specifically, we apply a single annual growth rate of two percent, which seems to be in line with the long-term growth perspectives for Spain, to most individual tax and transfer payments[6]. It was necessary, however, to modify the procedure of constant growth

[6] MTSS (1995), FBBV (1997), Herce and Alonso (2000) have opted for similar values, within a range from 1.1 to 2.5 percent. We have of course conducted a comprehensive sensitivity analysis, which brought out no qualitative changes in our findings.

uprating, to accurately incorporate various fiscal trends. In detail, our baseline projection of net taxes accounts for

- the substantial fall in primary deficits observed over the period 1996 to 1999, as well as the changes in primary deficits predicted by government institutions for years 2000 and 2001. Designing the effects on aggregate public sector revenue and expenditure levels, we first account for increasing labour force participation and declining unemployment. The tax and transfer profiles by employment status were adjusted according to observed (1997-1999) or predicted (2000-2001) changes in employment levels by age and gender.[7] In a second step, government purchases were adapted to the development of primary deficits. This admittedly *ad hoc* procedure could be justified, considered that there is no clear-cut evidence on the impact of recent fiscal policy changes on specific age cohorts yet.
- the fact that the pension system insures against inflation rather than preserving the income position of pensioners relative to workers. Consequently, regarding contributive and non-contributive pensions, we assumed that only the primary insurance amount of successive cohorts entering retirement or becoming eligible for derived pension benefits increases at the rate of productivity growth, whereas cohort-specific benefits remain constant upon death in real terms.
- the maturing of retirement pensions, which are still substantially lower for the oldest males, compared to men who retired more recently. We keep the initial cross-sectional pension levels constant upon death for all current retirees.
- the elimination of the possibility to retire early, which will come into effect over the next decade. We have not included, however, the long-term impact of the 1997 Pension Reform Act, considered that it is highly ambiguous depending on the exact shape of the wage profile in the final years of the working career, as shown by Abío et al. (2000) and Bonin et al. (2001).

[7] Observed unemployment rates are taken from INE (2000), whereas the predicted average decline in unemployment for 2000-2001 comes from MH (2000).

4. The Sustainability of Current Fiscal Legislation

Tables 2 and 3 display the generational accounts by gender for cohorts alive in 1996, given the baseline assumptions discussed above, and using a constant real annual discount rate of four percent to take future tax and transfer payments back to the base year[8]. Tables 2 and 3 also split the overall net tax burden into its various tax and transfer components.

For both men and women, the net payments to the public sector upon death exhibit a characteristic cohort pattern due to the forward-looking construction of the accounts and the distribution of tax liabilities and benefit entitlements across age groups. Lifetime net tax burdens gradually increase among the age cohorts in the first decades of their life. The generational accounts reach a maximum for the cohort of age 25 who has left the large educational transfers through the schooling system behind, but faces wage taxes and social insurance contributions over the full working life. For older generations living in 1996, rest-of-life net tax payments to the government decline, as remaining working life shortens and retirement approaches. The generational accounts turn negative, indicating a net transfer upon death. Irrespective of gender, the maximum net transfer from the government is observed for cohorts around age 70 who bear a low tax burden on income, while expecting high pension and health care benefit transfers. For older living generations, the generational accounts approach zero, in line with shorter life-expectancy.

Closer inspection of Tables 2 and 3 indicates that current fiscal legislation might imply substantial redistribution among genders. On average, men born in 1996 will face a positive life-cycle tax burden of 41,200 €, whereas women receive a lifetime net transfer of almost equal size, amounting to -43,300 €. Females pay substantially less taxes, which reflects the low labour force participation of Spanish women, but receive welfare benefits and education very similar to men. A particular source of gender redistribution appears to be the social insurance system. For the newborn generation of

[8] The discount rate is markedly lower than the return on secure bonds in the past decade. We expect, however, that Spanish interest rates, in the long-term, decline to levels similar to those in western Europe. A lower interest rate is not justified, as the appropriate discount factor must include a premium for risk.

the base period, social insurance contributions of men exceed benefits received from the contributive social security system, health and unemployment insurance by an amount of 10.200 €. Women who receive a life-cycle transfer of 19.900 €, on the contrary, are net beneficiaries. These plausible observations notwithstanding, one should stay cautious, however, to draw any definite conclusions on the subject of gender redistribution from the generational accounts by gender. Our perspective neglects the uneven distribution of pre-tax income among men and women, and, more fundamentally, private intra-gender redistribution, only cursorily treated in the underlying fiscal profiles by age.

The generational accounts displayed in Tables 2 and 3 enter into the long-term financing constraint of the public sector. Negative generational accounts indicate claims against the government that together with current government debt, must be serviced, at some future point of time, through positive net taxes drawn from other cohorts. To illustrate, the rest-of-life transfers measured for a representative current Spaniard of age 70 –amounting to 91,200 €– mainly consist of pension claims acquired through contributions in the past. The government will stay solvent only if these unprinted liabilities are serviced by cohorts with positive generational accounts. For representative agents, these are the age cohorts younger than 45. In the maximum, a representative 25-year old contributes 68,200 € to service intertemporal government liabilities.

Quite unusually, in Spain even cohorts who were very young in the base period contribute positively to the intertemporal budget of the public sector, if only by a small amount[9]. Since lifetime net tax payments of males balance lifetime net transfer receipts of females, the generational account of a representative agent born in 1996 amounts to 200 €. The fact that life cycle taxes paid, in present value terms, are almost in perfect balance with transfers received implies that the tax 'investment' is profitable –it yields a return slightly higher than the discount rate. From this result, considered that the gender specific generational account of the future newborn is quite similar to that of

[9] In the twelve European generational accounting studies compared by Jägers and Raffelhüschen (1999), this happens only in the case of Italy.

current newborn[10], it is also clear that in the aggregate, fiscal claims of future generations will hardly affect the sustainability gap at all. Assessing the sustainability of current fiscal legislation, the main question is then, whether, adding up over all cohorts, aggregate revenue from the younger living cohorts is sufficient to finance aggregate claims by the older living cohorts, and to cover government bonds.

The answer to this question is provided by inspection of Figure 1, which shows the development over time of public sector liabilities, in present value terms of year 1996, that corresponds to the set of generational accounts explained above. Starting from historical public sector debt which was 280 billion € (or 60.3 percent of GDP) in 1996, the sequence on display was generated by adding, in each period, the predicted primary surplus (or deficit) to the level of public liabilities in the previous period. Equation (2) immediately corresponds to this procedure.

As is evident from Figure 1, we predict that the Spanish government sector will run substantial primary surpluses throughout the next decades, supposed current tax and transfer levels are maintained. The small primary surplus of 1.78 billion € occurring in the initial budget –this figure can be easily checked in Table 1– rapidly expands. Surpluses then reach a maximum close to five percent of GDP throughout the 2010s. This process not only reflects the substantial improvement of public finances observed very recently. In the longer term, it is also attributable to demographic changes leading to a particularly favourable ratio of tax payers and benefit recipients in the first years of the new century.

According to the favourable development of primary surpluses, public liabilities fall drastically at first. Provided that primary surpluses are fully employed to redeem government bonds, historical debt vanishes as early as in 2009. Afterwards, as primary surpluses prevail, the government starts accumulating assets, which reach a maximum at about 200 billion € in 2027. Subsequently, however, demographic aging hits the government budget. Transfer spending largely increases while tax revenue is reduced substantially. With primary surpluses permanently turning into primary deficits public assets are rapidly liquidated. From the year 2050, to maintain tax and transfer levels

[10] The generational account for future females is -42.0 thousand € versus the value of -43.3 in Table 3, whereas the values for males are 44.2 (future) and 41.2 in Table 2.

despite increased demographic dependency, government debt again accumulates, converging to a present value of 34.7 billion € as soon as the population reaches a stable state. This amount represents the sustainability gap induced by current fiscal legislation.

The sustainability gap being positive, we conclude that current fiscal legislation is unsustainable. Government must change the net tax burden of at least one generation. However, according to our *status quo* projection, the liabilities of the Spanish public sector not yet funded appear to be very small. Expressed as a fraction of the aggregate future GDP, the intertemporal financing requirement amounts to a mere 0.15 percent[11]. In terms of the 1996 budget, this corresponds, e.g., to a 2.3 percent increase in labour tax revenue, or, alternatively, to a 1.7 percent cut in government expenditure not related to age. Consequently continuation of current fiscal policy would not lead to serious intergenerational redistribution. If the burden to close the sustainability gap were levied exclusively on future birth cohorts, they would face a generational account of 2.400 €. Current newborns pay only 2.200 € less.

The finding that intergenerational redistribution through current fiscal policy is modest holds for a range of reasonable growth and discount rates. The sustainability gap takes larger values, if the interval between the growth and the interest rate is small, because this gives a more weight to deficits in the distance. For example, for a 2.5 percent growth rate combined with a 5 percent discount factor, the sustainability gap amounts to a negative 0.26 percent of predicted yearly GDP. At the other extreme, when the discount rate is low, the sustainability gap increases somewhat, as long-run deficits are given higher weights.

To summarise, if the *status quo* benchmark describes future government policy properly, Spanish public sector finances appear to be in good shape not only in the short-term, but also from an intertemporal point of view. However, generational balance requires considerable fiscal prudence. As Figure 1 has illustrated, to smooth

[11] To report the sustainability gap in terms of the discounted sum of predicted future GDP has been suggested by Auerbach (1997). The resulting measure can be interpreted as the additional fraction of GDP that needs to be transferred to the public coffers, in each future year, in order to balance the intertemporal budget. To obtain a forecast of GDP, we linked initial output per worker, uprated for constant labour productivity growth, to a projection of the future labour force.

fiscal burdens across present and future generations, the public sector must accumulate a substantial, transitory fund of assets that can accommodate deficits due to increased demographic dependency in the long term[12]. Unfortunately, from the viewpoint of political economy, it does not seem very likely that political decision makers would actually introduce such a strategy. The debate on the recent budget improvements in Spain rather indicates that decision makers, faced with large and rising budget surpluses, are forced –and willing– to loosen fiscal policy. This is all the more worrying, as fiscal sustainability in Spain is by no means a certain outcome. Various developments could drive the intertemporal budget into more serious imbalance, which will be discussed in the following.

5. Threats to Fiscal Sustainability

The observation that Spanish public finances are very much in balance intertemporally provides a marked contrast to earlier generational accounting results for Spain reported by Berenguer et al. (1999). According to their study, continuation of fiscal legislation would seriously redistribute private resources to the disadvantage of future generations, who must bear a doubling in tax levels to cope with a substantial sustainability gap. For a comparison, in our benchmark, a 1.7 percent increase in future cohorts' tax levels is enough to balance intertemporal public sector liabilities.

Two aspects distinguish our sustainability analysis so far from the generational accounts constructed by Berenguer et al. First, we use a perfectly different –presumably by far more accurate– set of micro profiles in order to design age dependency of individual tax and transfer payments. It is known in generational accounting, however, that the sustainability outcome is rather insensitive to changes in the underlying micro structure of net taxes[13]. Second, our benchmark incorporates the budget development over the period 1996 to 2001, whereas the analysis by Berenguer et al. is based on the *status quo* of 1995 fiscal legislation.

[12] We note that it is not by necessity that the government has to accumulate this fund. In principle, primary surpluses might as well be transferred to private agents, for instance in the form of tax deductions on investments in private funded pension plans.

[13] CBO (1995) provides the most elaborate discussion of this issue.

There is little doubt that besides a substantial fall in interest burdens, steady and substantial economic growth is an important factor behind the rapid recent improvement in Spanish public finances (MEH (2000)). The expansive phase of the business cycle, in combination with various structural reforms on the labour market, has largely helped reducing unemployment. Correspondingly, transfer obligations of the government have fallen, and taxes received increased. In this situation, one might of course expect that the sustainability of public finances is improving. Our benchmark scenario, therefore, invites criticism as being overly optimistic. Taking off in an expansive economic environment, and forecasting public revenue and spending according to a rule that focuses on demographic changes, our projection has indeed no room for a rainy day in the future[14].

In order to assess how fiscal sustainability would develop with more moderate economic prospects, we have also analysed a scenario that excludes the improvement in primary deficits observed in recent years. By continuing the tax and transfer levels implied by the public sector budget of 1996 when the business cycle was still well off its peak, we try to better capture what might be the long-term average of economic conditions hitting government budgets. Note that this stricter *status quo* approach withdraws from the calculations, in particular, the current decline in unemployment levels.

Figure 2 illustrates how permanently less positive economic conditions, in comparison to the benchmark, would affect the future development of primary budget surpluses entering into the intertemporal financing constraint of the government. Without the recent economic upswing, the primary budget surpluses would have stayed on a substantially less favourable time path. Even during the demographically most advantageous second decade of the new century, primary surpluses do not exceed three percent of GDP, more than two percentage points less than for the benchmark. Accordingly, primary surpluses turn into permanent deficits earlier. With worsening demographic conditions, deficits rapidly increase and exceed ten percent of GDP at the

[14] It is an established result that the sustainability indicators provided by generational accounting are not immune against cycle effects. Feist et al. (1999) have provided a discussion of this problem.

peak around 2050. In the very long-term, primary deficits converge at a level about four percentage points below that in the optimistic benchmark.

One explanation for the substantially higher structural primary deficit observed is that with less favourable economic conditions, agents, over the life-cycle, turn into net beneficiaries of the fiscal system. In contrast to the optimistic benchmark, the generational account of each newly born is negative. As shown in Table 4, which summarises the generational accounts for the different economic scenarios investigated in this and the following section, the per capita life-cycle net transfer from the government approximates 12,900 €. As a consequence, sustainability of 1996 tax and transfer levels not only requires that net tax revenue from current working-age cohorts with positive generational accounts were large enough to repay debt, but also to finance an intertemporal transfer to future generations.

It is obvious from Figure 2 that this cannot be the case. With primary surpluses always smaller and primary deficits constantly larger than under benchmark conditions, intertemporal fiscal imbalance must increase. The extra revenue required to close the larger sustainability gap is substantial. To remain solvent the government must extract, in each year, additional resources worth 3.05 percent of GDP from the private sector. In terms of generational accounts, supposed this burden is entirely levied on future cohorts, each representative agent would have to pay 23,200 € to the public coffers, 36,300 € more than a current newborn. Thus, as soon as the positive economic conditions observed today are not permanent, fiscal legislation is well in danger to tolerate substantial redistribution across generations.

6. Labour Market Trends and Fiscal Sustainability

The major switch in fiscal sustainability over the business cycle revealed by the above sensitivity test seems largely related to the recent changes in individual employment rates. This observation makes it worth analysing to what extent future labour market developments would improve long-term government finances which still seem to be on the verge of inducing substantial intergenerational redistribution, as soon as current economic conditions do not prevail. Employment rates of the representative agent may change either due to variation in individual participation rates on the labour market, or

due to changing unemployment levels. In the following, we use generational accounts to analyse the specific impact on intertemporal government finances of these two different labour market developments.

To design the effect of labour market changes, we have taken advantage of the fiscal age profiles by employment status, i.e., employment, unemployment or non-participation, available to us. In the projections of primary deficits, we corrected the level of income taxes, social insurance contributions, value added taxes and, of course, unemployment benefits, for changes in labour market conditions, by proportionally adapting the corresponding fiscal micro profiles to the assumed variation in individual participation or unemployment rates by age and generation[15]. As a consequence, the relative change in aggregate revenue and expenditure levels is different from the change in average employment rates. Our calculations also reproduce the fact that the age distribution of tax and transfer levels is not the same for the different categories of labour market status.

Based on this principle, we first simulate a future improvement in labour force participation. There are good reasons to assume that labour force participation will rise substantially over the next decades. Analysts of the trends in labour participation seem to agree that the traditionally marked gender gap on the Spanish labour market is in the process of closing. In fact, in the 1999 cross-section of labour force participants, female younger than age 30 are hardly less present than males already. If this trend continues, from a cohort perspective, the gender gap in participation rates would become irrelevant over the next three decades. To implement such a development into the generational accounts, we have used projections of participation rates previously employed by Fernández Cordón (1996) and Blanes et al. (1996). In these, the existing gender gap almost disappears up to the year 2025, as female participation gradually approaches the usual hump-shaped age profile observed for men– the latter falling slightly, reflecting joint household labour supply decisions.

[15] One might argue that this procedure is misleading in the case of indirect taxes. In fact, considered that according to the neo-classical consumption model, the representative consumer should distribute an increase in wage income over the life cycle, we might overstate the immediate revenue effect for the government. This limitation –the absence of behavioural changes– is always present, however, when doing generational accounting.

Of course, the projected variations in labour force participation should impact on the expenditure side of government finances not only with regard to unemployment benefits. In fact, the current participation gap among genders turns out to be well reflected in many of the transfer profiles related to labour that we could not break down according to employment status directly. We have used the correspondence between more and less employed cohorts to predict the labour market impact on benefits. In detail, we adapted contributive and non-contributive invalidity benefits, temporary incapacity benefits and LISMI contemporaneously to the labour force participation changes. Regarding pensions, we considered that after a time lag, primary insurance amounts must increase, if cohorts who on average work more enter into retirement.

Supposed benchmark conditions hold for the initial period from 1996 to 2001, we observe that the sustainability gap becomes larger in response to an increase in average labour force participation. The revenue requirement of the public sector to remain solvent grows substantially, from 0.15 to 1.6 percent of annual GDP. The result that higher employment levels worsen the sustainability of current fiscal legislation might appear counterintuitive at first. However, provided that our simulation of the impact on benefits is appropriate, the catching up of female generations on the labour market reduces representative agents' net tax contribution to the intertemporal budget. Newly born cohorts, for example, turn from net contributors to the government budget into life cycle net beneficiaries, receiving transfers of 3,100 €. Obviously, the on average higher tax payments of females are not sufficient to balance their rising entitlement to labour-related transfers (and to compensate the lower net tax payments of men who work less). Consequently, then, intergenerational redistribution increases, with future cohorts required to pay 15,800 € more to keep the government solvent.

A main reason for the decline in generational accounts despite cohorts working more is that the current social insurance system is not actuarially fair. This means that from a life cycle perspective, the increase in benefits corresponding to an increase in contributions –explained by rising labour force participation, in our case– is larger, in present value terms, than the increase in contributions itself. A policy necessary to evade rising intertemporal imbalance when labour force participation is increasing,

therefore, is to move social insurance contributions and benefits closer to actuarial fairness. Unfortunately, constructing generational accounts for actuarially fair social insurance is a highly intricate matter. Instead, we have re-calculated the sustainability gap for the labour force participation experiment assuming that there would be no expenditure effects of this development at all, which provides an upper bound of what could be the positive impact on fiscal balance with an actuarial fair system.

Including tax effects only, generational accounts must improve as participation on the labour market increase. As shown in Table 4, the generational accounts of the newly born are now positive. The higher net tax contributions to the public coffers of living generations actually lead to a sizeable intertemporal surplus to the public coffers, worth 0.85 percent of aggregate future GDP. This surplus is even large enough to finance an aggregate transfer to future birth cohorts. In this most optimistic scenario, fiscal policy could assign a life cycle net transfer of 6,900 € per capita to future generations without violating the intertemporal financing constraint of the public sector.

It is frequently argued that a shrinking labour force in the future could lead to a reduction in unemployment. Therefore, as an alternative labour market scenario, we have tried to simulate the effects of a further decline in individual unemployment rates. By doing so we do not claim that there would actually exist a correlation between population size and unemployment conditions. In fact, there is theoretical and empirical evidence that there does not exist a clear-cut link between these two variables. Our purpose then is to illustrate to what extent at most continuation of the current favourable labour market development in Spain can reduce the chance that fiscal policy is caught in a sustainability gap. Consequently we have chosen a scenario obviously counterfactual. We assume that the natural rate of unemployment, set to four percent of the labour force, is reached immediately –and permanently– after 2001.

Designing the impact of this scenario on taxes and transfers, we again followed the strategy outlined above. Contrary to the labour force participation experiment, in lack of satisfactory empirical facts to measure the necessary adjustments, we excluded

effects on transfers besides those on unemployment benefits, however[16]. The unemployment experiment, therefore, is only comparable to the participation scenario excluding transfer adjustments. The findings reported in Table 4 indicate that full employment could provide an even better insurance against long-term insolvency of the public sector than rising labour force participation. Intertemporal government wealth, if current fiscal legislation is maintained, reaches as much as 1.08 percent of yearly GDP. Interpreting this outcome one should bear in mind though that full employment, despite the current economic upswing, is barely a realistic perspective for the Spanish economy even in the medium term future. Moreover, as long as social insurance keeps to redistribute across generations, the long-term fiscal gain from falling unemployment could be substantially smaller than is indicated by our last experiment.

7. Conclusions

With budget deficits rapidly falling, and the perspective on public finances improving further in the years to come, political decision makers in Spain might come under serious pressure to relax fiscal policy. Similar to other countries where the reduction of deficits has made substantial progress recently, one might expect that the public debate on whether to spend budget surpluses on higher net transfers to privates, or on the redemption of historical debt, will become more intense. The generational accounting viewpoint, which forces the attention to the long-term prospects of public finances, can contribute a number of important insights to this debate.

First, although the sustainability of government finances has clearly improved in the course of the recent economic expansion, one should be careful to take the leap in the development of primary surpluses over time for permanent. As soon as the Spanish economy grows only at a more moderate pace in the long term, or if unemployment

[16] The easiest way to design the impact of falling unemployment on entry pension levels seems to be to evaluate the primary insurance amount explicitly, on the basis of the pension formula, which takes into account the wage history and the number of contributive years. Unfortunately, this is a very difficult approach in practice, because while receiving benefits, the unemployed go on paying contributions relative to their last wage.

cannot be controlled at the current level, the probability of redistribution across generations via the intertemporal government budget increases alarmingly.

Second, due to the strong life-cycle component of net revenues, government budgets in Spain will come under very severe demographic pressure by the middle of the new century. Even if decision makers can maintain the remarkable present balance of individual life cycle tax payments and benefit receipts, primary deficits temporarily might exceed six percent of GDP. To eschew redistribution to the disadvantage of future generations, the generational accounts show that it is necessary to direct the surpluses ahead into a –public or private– fund that can accommodate the structural budget deficits due to rising old-age dependency. In contrast, a policy to increase consumable net transfers to private sector, i.e. to reduce generational accounts, is clearly not sustainable

Reform in the pension system is already in process. Although the measures cutting expenditure enacted with the 1997 Pension Reform Act seem to be far from sufficient, one of the main achievements has been the financial isolation of the contributive system. Thanks to this process, the implicit surpluses of the system have been made evident. In the current political debate on for how to the use this surplus, the suggestion to raise a fund has to compete with proposals of cutting contributions or improving benefits.

The generational accounts indicate that the fund solution –either public or private– could be superior to avoid intergenerational fiscal imbalance, and that current surpluses should not distract the attention from further reforms during the revision of the Toledo Agreement due in 2001.

In particular, decision makers should make steps toward actuarially fairer social insurance. The results of our labour market experiments can be interpreted in the sense that the present imbalance, over the lifetime, of contribution payments and corresponding entitlements to benefits, adds to an intertemporal fiscal deficit and hence intergenerational redistribution. Without an actuarially fairer system, it might be that neither the expected improvement of female labour force participation, nor a possible further reduction in unemployment, could substantially remove demographic pressure from government budgets.

Finally, it is worth noting that the reform of the pension system might not be enough to ensure the viability of fiscal policy against the demographic cycle. There are other main programs like health care provision relying on general taxes, which are also heavily dependent on demographics. Only if prudent decision makers successfully cope with these challenges, our generational accounting results, perhaps in contrast to earlier findings, give some hope that Spain might pass through the demographic transition without too severe financial crisis.

Appendix

In the appendix, we describe the improved set of age-related micro data underlying our re-calculation of generational accounts for Spain. We summarize the construction of age-specific tax profiles, before describing how we derived the profiles for age-specific transfers. More details on the construction of the micro profiles are available from the authors upon request.

Tax Profiles

Micro profiles measuring the relative payments by age and gender of personal income taxes, social security contributions and most indirect taxes were retrieved on the base of the 1996 ECPF, which contains quarterly information on about 3,200 households. The age profiles were obtained separately for the employed, unemployed and non-participants in the labour market, i.e. they are also participation-specific.

In order to correct the well-known problem of income underreporting in the ECPF, we assumed that the degree of underreporting depends on the source of income and, following Gil and Patxot (2000), inflated reported net wage, unemployment and pension income to the observed macro magnitude taken from the Spanish National Accounts (INE, 1996a), and other statistical sources (IEF, 1996).

Constructing the personal income tax profiles, we aimed at reproducing the 1996 individual personal income tax return. First, net wage earnings, as well as pension and unemployment benefits (also taxed as personal labour income in Spain) were converted into gross terms by considering the respective income retention and social security contribution rates. Second, disposable income was determined by application of the appropriate allowable expenses. Third, adding up disposable income from different sources, the total tax liability for each taxpayer was inferred from the tax rate schedule. The tax finally paid was derived after accounting for tax allowances related to rent, health care, dependent relatives and children, housing and mortgage interest (all of them imputed to the head of the household) and labour earnings.

Calculating social security contribution profiles we differentiated between salaried, self-employed and unemployed income for each contributor. Having

converted the relevant net income into gross income we applied an average 24 % contribution rate for the whole pension system (Herce et al., 1996), and a 6.4% contribution rate for unemployment incomes. This implies that the incidence of employer and employee contributions is on the employee, as seems realistic for Spain, according to Argimón and González-Páramo (1987) and Escobedo (1991).

With respect to capital taxation, we consider the personal capital income tax and taxes linked to land property. Being fully aware of the poor performance of capital earnings records in the ECPF, we imputed age- and gender specific tax payments on capital income by converting reported net capital and property income into gross terms. The tax burden on land property was distributed according to reported taxes on principal and secondary housing. Concerning indirect taxes, we computed VAT profiles grouping consumption reported in the ECPF into categories according to the legal tax rates applied– 0, 4, 7 and 16%. As the ECPF only provides the consumption structure of the household, we assigned household consumption to individual household members proportionally to their income share in the household, abstracting from intra-household transfers. Similarly, profiles for excise duties on hydrocarbon oil and some transportation vehicles, were constructed by imputing their revenues according to household spending on gasoline, diesel oil and fuel and on the acquisition of new and second-hand vehicles, respectively.. Finally, profiles for excise taxes on alcohol (divided into beer and alcoholic drinks) and tobacco (distinguishing cigarettes, cigars and pipe tobacco) were derived by considering frequency and quantity of drug use as reported in the 1997 National Health Survey, to estimate the respective age-specific consumption patterns. Tax incidence is assumed to be directly on the consumer, which seems uncontroversial, given that the demand for these goods is comparatively price-inelastic.

Transfer Profiles

Among the contributive social security benefits, we consider pensions, maternity and temporary incapacity benefits. Profiles of average per capita pension receipts by age and gender are directly available from administrative data (MTAS, 1996a) for different categories (old-age, invalidity, widow, orphans and in-favour-of-relatives pensions).

With respect to maternity benefits, despite parents being the recipients of the cash transfer, we established the assumption that newborns are the ultimate beneficiaries. Finally, as direct evidence on temporary incapacity benefits is unavailable, we assigned transfers using age-related data on labour accidents during the working day and the average period of discharge reported by MTAS (1998).

Concerning non-contributive transfers, we considered the number of beneficiaries by age and gender, the monthly uniform insurance amount for each type of benefit taken from MTAS (1996b) and the underlying population structure, to derive age-profiles for non-contributive old age and invalidity pensions and four out of seven LISMI (*Ley de Integración Social de Minusválidos*) benefits. Similarly, we used data provided by INEM (1996) on average monthly gross unemployment income by age and gender for the construction of unemployment benefit profiles.

To derive age profiles assigning public health care spending, we computed, similar to Alonso and Herce (1998), a synthetic indicator weighting data on actual hospital stays sojourn by age, gender and final diagnostic reported by INE (1996b), taking into account the population composition. Thus, we obtained the expected J-shaped curve for public health spending.

Finally, to assign government expenditure on education we used data from MEC (1998a,b) and the Consejo de Universidades (1998). We first derived spending per student by dividing, on each educational level, total spending by the aggregate number of pupils enrolled. Then we used the enrolment rates by age and gender in the different levels of education to construct, for each age group, a weighted average of per student spending. In a few cases, where we could not construct enrolment rates by age, we distributed students uniformly (or exponentially, in the case of graduate education) across the age groups compatible with the level of education in question.

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Table 1. Composition of the Spanish Public Sector Budget in 1996
(Millions of Euro)

Revenue		Expenditure	
Direct Taxes		Contributive Pensions[b]	
Personal Income Tax	30,498	Retirement Pensions	24,721
Social Security Contributions	57,854	Invalidity Pensions	11,369
Capital Income Tax[a]	17,362	Widow Pensions	8,324
Taxes on Land Property	3,419	Orphan Pensions	580
Indirect Taxes		Pensions in favor of Relatives	145
Value Added Tax	23,106	Non-contributive Pensions	
Excise Taxes on		Retirement Pensions	543
Alcoholic Drinks	625	Invalidity Pensions	578
Beer	198	LISMI benefits	314
Tobacco	2,687	Unemployment Benefits	9,415
Hydrocarbon Oil	8,216	Temporal Incapacity Benefits	3,876
Transportation Vehicles	1,534	Maternity benefits	482
		Family allowances	623
		Health expenditure	24,039
		Educational Expenditure	16,939
		Government Purchases[c]	41,769
Deficit	20,729	Interest Payments	22,509
Total		Total	
	166,227		166,227

[a] Includes wealth taxes, corporate taxes and personal income taxes attributed to capital.
[b] Includes pensions paid by institutions other than the Social Security Administrations.
[c] Non age-specific purchases of goods and services net of non age-specific receipts.

Sources: Own elaboration on base of IGAE (1996a,b,c, 1997a,b), MEH (1996).

Table 2. Composition of the Spanish Generational Accounts, Male Population of 1996 (1000s of Euro)

Age in 1996	Generational Account	Tax Payments					Transfer Receipts						
		Labour Income Taxes	Capital Income Taxes	Value Added Taxes	Excise Duties	Social Insurance Contributions	Contributive Pensions	Other Contributive Benefits	Non Contributive Benefits	Unemployment	Health Care	Education	Government Purchases
0	41.2	40.7	19.6	26.9	11.6	75.1	34.4	5.3	1.4	4.0	22.1	23.6	41.7
5	59.0	44.8	21.6	29.7	12.8	82.9	37.5	4.5	1.4	4.4	20.9	23.8	40.5
10	79.2	49.3	23.7	32-7	14.1	91.3	41.2	4.9	1.1	4.9	22.2	18.6	39.1
15	102.0	54.2	26.1	36.0	15.6	100.6	44.8	5.4	1	5.6	23.6	12.3	37.5
20	123.5	59.5	28.6	38.9	16.4	108.7	49.1	5.9	0.8	6.1	25.1	5.5	35.9
25	133.3	63.7	30.7	40.4	15.6	112.4	53.9	6.2	0.8	5.5	26.4	2.4	34.2
30	129.4	65.1	33.0	40.3	14.7	108.5	59.1	6.2	0.8	4.5	27.7	1.5	32.3
35	112.9	63.3	34.8	38.5	13.0	98.3	64.7	6.0	0.6	3.6	28.7	1.3	30.2
40	90.0	60.0	35.5	35.5	11.5	85.6	70.1	5.5	0.7	3.0	29.6	1.1	27.9
45	54.0	52.6	36.4	31.0	9.8	67.9	79.3	4.9	0.6	2.5	30.2	0.9	25.4
50	8.0	42.0	35.7	26.3	8.2	46.6	89.9	4.2	0.6	2.1	30.5	0.7	22.7
55	-46.2	28.9	26.2	21.0	7.0	24.4	97.4	3.2	0.6	1.4	30.4	0.5	20.0
60	-83.5	20.2	21.6	16.8	5.4	8.4	105.1	2.5	0.6	0.4	29.5	0.3	17.3
65	-94.5	14.9	20.7	13.2	4.0	0.2	103.0	1.7	0.5	0.0	27.7	0.0	14.5
70	-105.0	9.9	13.3	9.7	2.7	0.0	102.1	1.0	0.6	0.0	25.1	0.0	11.8
75	-83.7	7.4	12.2	7.5	1.86	0.0	80.0	0.6	0.4	0.0	22.0	0.0	9.4
80	-61.3	4.2	9.1	5.1	0.1	0.0	52.9	0.2	0.3	0.0	18.9	0.0	7.2
85	-49.3	2.2	2.0	3.3	0.0	0.0	35.0	0.1	0.2	0.0	16.0	0.0	5.4
90	-37.2	0.7	0.1	2.3	0.0	0.0	23.3	0.0	0.2	0.0	13.2	0.0	4.0

[a] Includes temporal incapacity and maternity benefits. This, toghether with contributive pensions constitute the contributory social insurance system which is in the process of financial rationalisation since the 1997 Pension Reform Act.

Note: Baseline assumptions; growth rate: 2 percent; discount rate: 4 percent.
Source: Authors' calculations.

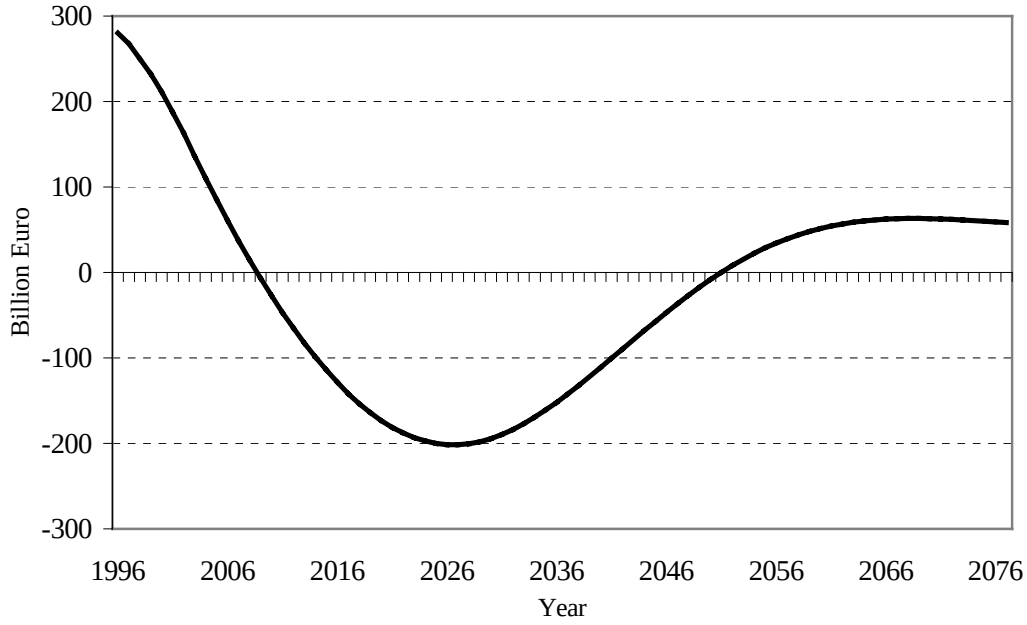
Table 3. Composition of the Spanish Generational Accounts, Female Population of 1996 (1000s of Euro)

Age in 1996	Genera-tional Account	Tax Payments					Transfer Receipts						
		Labour Income Taxes	Capital Income Taxes	Value Added Taxes	Excise Duties	Social Insurance Contribu-tions	Contri-butive Pensions	Other Contributive Benefits[a]	Non Contributive Benefits	Unem-ployment	Health Care	Educa tion	Govern-ment Purchases
0	-43.3	12.5	11.6	12.7	10.0	31.6	21.9	3.3	2.4	5.9	20.4	24.2	43.3
5	-35-3	13.7	12.8	13.9	10.9	34.8	24.0	2.2	2.3	6.5	19.5	24.4	42.4
10	-24.8	15.1	14.1	15.4	12.0	38.4	26.4	2.5	2.3	7.2	20.9	19.4	41.2
15	-12.9	16.6	15.6	16.8	13.2	42.3	29.0	2.7	2.2	8.1	22.4	13.1	39.8
20	-1.3	18.1	16.8	18.1	13.8	45.4	31.8	3.0	2.2	8.6	23.8	5.9	38.4
25	0.5	18.7	17.5	18.5	12.8	45.5	34.8	3.3	2.3	7.6	24.9	2.5	36.8
30	-6.7	17.4	18.3	17.6	11.8	40.1	38.3	3.2	2.4	5.9	25.5	1.6	35.1
35	-19.1	14.7	19.2	16.1	10.6	32.3	41.6	3.2	2.5	4.3	25.7	1.3	33.1
40	-32.2	12.1	19.3	14.4	9.3	24.9	45.2	3.1	2.7	3.1	26.2	1.1	31.0
45	-48.3	8.9	18.9	12.5	8.2	16.5	49.3	3.0	2.9	1.9	26.6	0.9	28.6
50	-64.8	6.3	15.9	10.9	7.2	9.5	53.6	2.9	3.2	1.1	26.9	0.7	26.1
55	-72.4	4.8	15.4	10.2	6.1	2.9	56.9	2.3	3.3	0.5	27.1	0.5	23.4
60	-78.4	3.9	14.8	9.3	5.0	1.6	60.0	2.3	3.1	0.1	26.8	0.3	20.5
65	-77.6	3.4	13.3	8.6	3.9	0.1	59.1	1.6	3.0	0.0	25.9	0.0	17.4
70	-80.1	2.8	9.2	7.3	2.7	0.0	60.0	0.9	2.9	0.0	23.9	0.0	14.3
75	-67.3	2.0	7.2	5.8	1.4	0.0	49.0	0.6	1.8	0.0	21.1	0.0	11.3
80	-50.0	1.6	6.9	4.6	0.0	0.0	34.6	0.3	1.6	0.0	18.0	0.0	8.5
85	-34.5	1.5	5.9	3.3	0.0	0.0	22.3	0.1	1.4	0.0	15.1	0.0	6.3
90	-22.0	0.8	2.0	2.2	0.0	0.0	9.2	0.0	0.9	0.0	12.3	0.0	4.5

[a] Includes temporal incapacity and maternity benefits. This, toghether with contributive pensions constitute the contributory social insurance system which is in the process of financial rationalisation since the 1997 Pension Reform Act.

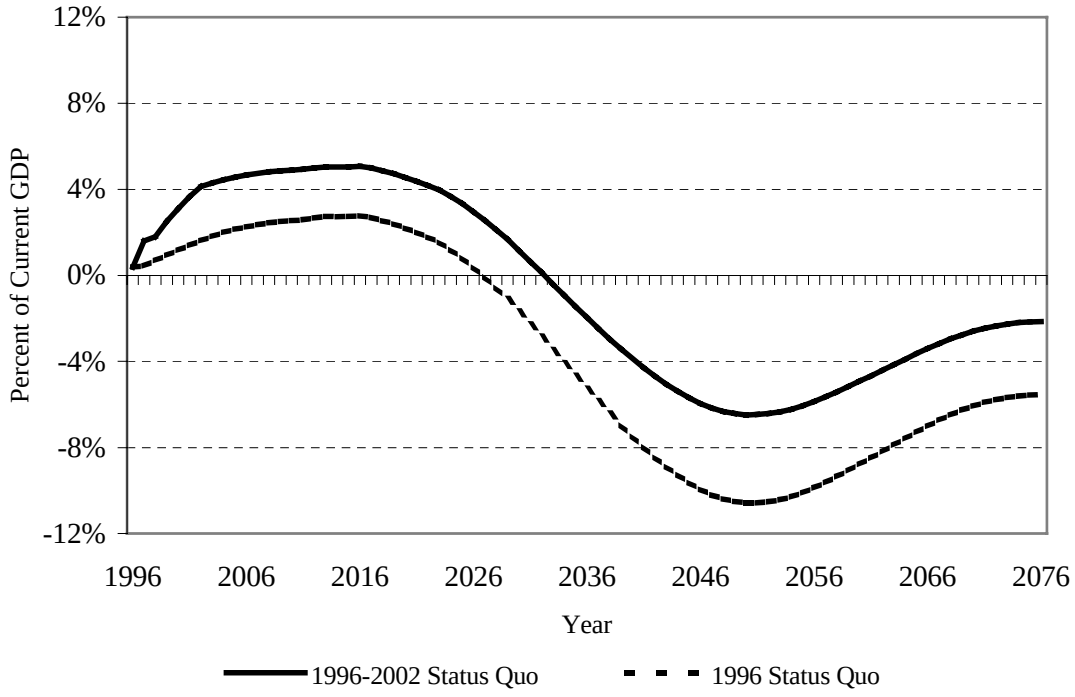
Note: Baseline assumptions; growth rate: 2 percent; discount rate: 4 percent.
Source: Authors' calculations.

Figure 1. Development of Public Sector Liabilities
(Present Value of 1996)



Note: Growth rate: 2 percent; discount rate: 4 percent.
Source: Authors' calculations.

Figure 2. Development of Primary Surpluses
(Percent of Current GDP)



Note: Growth rate: 2 percent; discount rate: 4 percent.
Source: Authors' calculations.

Table 4. Generational Accounts and Sustainability Gap for Different Economic Developments

	Benchmark Scenario	Status Quo of 1996	Changes in Labour Force Participation		
			Including Transfer Effect	Excluding Transfer Effect	Full Employment
Generational Accounts:					
Birth Cohort of 1996	200	-12,900	-3,100	5,600	7,700
Birth Cohorts after 1996	2,400	23,200	12,700	-6,900	-7,900
Change in Fiscal Burden	2,200	36,300	15,800	-12,600	-15,600
Sustainability Gap (Percentage of yearly GDP)	0.15	3.05	1.05	-0.85	-1.08

Note: Generational accounts in €; growth rate: 2 percent; discount rate: 4 percent.
Source: Authors' calculations.

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