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En route to sustainability: history, status quo, and future reforms of the German public pension scheme

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Abstract

Since the German pension system was founded at the end of the 19th century, it has been subject to many reforms. In this paper we analyse the major changes under the light of sustainability, beginning with the reform of 1957. Conducting a generational accounting approach we find that the sustainability gaps of the pension scheme are highly volatile over time. After a period of increasing the generosity of the system until the late sixties, the reform of 1972 marks a turn-around, characterised by raising contributions and lowered benefits. Today, the German pension system is very close to be sustainable.

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Introduction

The German public pension scheme was the first compulsory old-age provision system for workers in the world. Since the Reichstag adopted the “Law on Invalidity and Old-Age Insurance” proposed by Bismarck in 1889, fundamental reforms have been undertaken until today. In this article, we want to provide an overview of the most substantial changes since the harmonisation of the pension system for blue-collar workers and salaried employees and the adoption of wage-indexation in the year 1957, focussing on the sustainability of financing the German pension scheme. To do so we use the method of generational accounting and show sustainability gaps for each year between 1957 and today. We will start with a brief outlining of the generational accounting approach and of the data used for our calculations. Subsequently, we will present our results together with a chronological description of the major changes in the German pension policy, and close with an outlook on the necessity for future reforms.

Method and Data

As mentioned above, we want to compute historical sustainability gaps of the German pension system starting with the year 1957. These sustainability gaps are shown by using a modified method of generational accounting. Generational accounting is based on the idea of calculating all future tax and transfer payments between the individuals and the public sector, mainly in PAYG-financed social security systems.¹ Only if the sum of all payments to and from the public sector is equal the so called intertemporal budget constraint is fulfilled. This means that the current fiscal policy can be continued for all future generations. If the intertemporal budget constraint however is not balanced, a sustainability gap arises. It quantifies the present value of all future deficits of a public sector thereby illustrating the necessity of reforming the social security systems. For an easier understanding the value of a sustainability gaps is measured as total debt in proportion to GDP.

¹ The method of generational accounting was developed by A. Auerbach, J. Gokhale, L. Kotlikoff: *Generational Accounting: A Meaningful Alternative to Deficit Accounting*, in: D. Bradford (ed.), *Tax Policy and the Economy*, Volume 5, MIT Press, Cambridge, 1991, p. 55–110. For a detailed depiction of the version used at the Research Center for Generational Contracts see H. Bonin: *Generational Accounting - Theory and Application*, Springer-Verlag, Berlin, Heidelberg, 2001 and B. Raffelhüschen: *Generational accounting: method, data and limitations*, in: European Commission (ed.), *Generational Accounting in Europe*, European Economy, Reports and Studies 6/99, 1999, p. 17-28.

The standard approach to a generational accounting study starts by using projections of expenditures and revenues on an individual level. Hence, the age- and sex-specific profiles are rescaled according to the initial macroeconomic aggregates of public revenues and expenditures and then extrapolated into the future by using the constant annual real growth rate. To obtain all future revenues and expenditures of the public sector, these profiles are multiplied with the number of members of the respective cohorts. The latter are derived from a population projection.

For this task we need to modify the standard method.² Firstly, instead of calculating an account for the whole public sector, we focus solely on the German pension system. In other words only the expenditures (pension benefits) and revenues (contribution and federal subsidies) of the German public pension scheme are considered. Secondly, we apply the same method several times for a variety of projection years; beginning with the year 1957 until today. More precisely, to calculate the sustainability gap of one specific projection year, we only use the macro-budget and micro-data known at this point in time. For example, the database of 1957 only contains a cross section of contribution rates, federal subsidies and pension benefits as actually incurred in that year. To calculate the sustainability gap for the following projection years, we reapply the same method simply updating the new data information known in the specific year. In general, for the extrapolation of the data the real growth rate is used. Up to 2003 we rely on the actual rates and for the period after 2003 we assume a constant real growth rate of 1.5%. In order to ensure comparability of the results over the whole time series all calculations refer to the same base year 1957 and all sustainability gaps are calculated in values of 2003.

The last modification to the method affects the handling of the benefits of entering retirees. Usually in generational accounting studies only the payments to existing retirees of the respective projection year are taken into account for the extrapolation of future developments. In our case the projection of the future payments to existing retirees is based on the accumulation of annual payments to entering retirees. In other words, every future existing retiree will receive the same benefits as at the beginning of his retirement period.

In order to calculate the historical sustainability gaps for the German pension system, diverse data for the years 1957 to 2003 is required: population, macroeconomic aggregates as well as age- and sex-specific micro-profiles of the German pension system and real growth rates. Furthermore we need a population projection for the future.

² The following calculation approach is based on M. Heidler, B. Raffelhüschen: How Risky is the German Pension System? The Volatility of Internal Rates of Return, Discussion Paper, Research Center for Generational Contracts, Freiburg University, forthcoming.

Demography: The population data for the past and the assumptions for the projection are taken from the “German Bureau of the Census” (Statistisches Bundesamt). For the projection of the population after 2003 the assumptions of the middle variant of the “10th coordinated population projection” (10. koordinierte Bevölkerungs-vorausberechnung) is chosen.³

Aggregates: The time-series of aggregates used for the former West German states since the year 1957 and the New Laender since the year 1992 are published by the “Association of German Retirement Insurance Organisations” (Verband Deutscher Rentenversicherungsträger).⁴

Micro-profiles: Before projecting the rescaled per capita net payments, we need to distribute the aggregates on age- and sex-specific profiles per capita of the population. Therefore, we use profiles of the contribution payments and the federal subsidies on the one hand, as well as the expenditure profiles on the other. The contribution payments and the expenditure profile are published by the Association of German Retirement Insurance Organisations.⁵

Reforms and Sustainability

The historical sustainability gaps in Figure 1 illustrate chronologically major changes in the German pension policy. We split the period from 1957 to 2002 up into three periods. Every period starts with a fundamental reform. Characteristic for every period is a phase of increasing generosity within the pension system, hence, forcing a phase of rising funding requirements, namely higher contribution rates or reductions in pension benefits.

Period I (1957-1971): In 1957 the wage-indexed adjustment of the pension benefits was introduced. Furthermore early pensions due to unemployment and pensions for women were implemented. In the sixties the increasing number of pensioners due to unemployment and the increasing share of credits for times spent at war as well as higher credits for education raised the generosity of the system. Therefore, as shown in Figure 1, the sustainability gap started at a level of 336% and culminated in 1967 at 952%. These

³ The calculation method of the projection is based on Bonin (see fn 1). The resulting old-age dependency ratio – individuals aged over 60 in proportion to the 20 to 59 year olds – amounts to 0.45 in 2003, rises only slightly up to 0.5 in 2015 and afterwards increases faster culminating in 0.78 in 2058. We use this ratio as approximation for the ratio of retirees to labour force in the calculation of the sustainability factor later in this paper.

⁴ Cf. Verband Deutscher Rentenversicherungsträger (ed.): Rentenversicherung in Zeitreihen 2004, DRV-Schriften, Band 22, Frankfurt, 2004.

⁵ The expenditure profiles for entering retirees have been published since 1957, whereas the existing retirees data before 1984 is taken from the “Federal Minister for Labour” (Bundesministerium für Arbeit). The contribution profiles have also been published by “Association of German Retirement Insurance Organisations” since 1984. For the period 1957-1983 we keep the profiles at a constant level. The federal subsidies distribution is obtained from the Income and Consumer Survey 1993 (“Einkommens- und Verbrauchsstichprobe”).

extensions were followed by a raising contribution rate from 14% in the year 1965 to 17% in 1970. Hence, the sustainability gap decreased to 568% in 1971.

Period II (1972-1991): At the beginning of the seventies the second major pension reform took place. It basically enacted generous rules for diverse paths of early retirement and a minimum pension. Consequently, the sustainability gap almost doubled from 582% in 1972 to 1.155% in 1976. This reform was followed by cuts in the benefit level: the indexation of the pension adjustment formula was capped in the second half of the seventies, resulting in a sustainability gap of 687% in 1979. At the beginning of the eighties earlier retirement for pensions due to incapability to work was introduced, however the eligibility of these pensions was tightened. Moreover, the eligibility for regular retirement was eased. So altogether the generosity of the pension system remained quite constant at a high level of about 660%. Finally, the policy maker increased the contribution rate step by step to 19.2% in the year 1986. As a result, the sustainability gap decreases almost to the level of 1958.

Period III (1991-2002): The third period is characterised by two major impacts. Firstly, beginning with the pension reform 1992 the policy makers started to respond to the demographic change in the German population. Secondly, the secular shock of the German reunification inflated the existing West German social security system. The pension system faced additional expenditures due to the integration of the New Laender. The sustainability gap blew up to 860% in 1995. At the same time, the extensive reform of 1992 marked the beginning of a consolidation period in the German pension policy: the minimum pensions were abolished, credits for education were decreased, and deductions for early retirement were introduced – being effective at the beginning of the next decade. Finally, the net-indexation of the pension benefits capped the pension adjustment and established a negative impact of raising contribution rates in the adjustment formula. Furthermore the contribution rate was raised to 19.5% to cope with the demographic transition as well as the increasing unemployment. During the nineties the sustainability gap decreased continuously reaching a value of 308% in the year 2000. The new century started with the so called “Riester-Reform”, which marked the beginning of a shift from the PAYG-system to a partially funded pension scheme. More precisely, the reform introduced the possibility of government-subsidised investment amounting to a fixed percentage of the individual gross-income, annually increasing from 0.5% to 4% in 2009. In addition, the pension adjustment formula has been modified such that the increasing share of gross-earnings for savings reduces the pension adjustment by about 0.6%. Finally, the net-wage indexation of 1992 was replaced by the modified gross-wage indexation. This leads to a

stronger negative reaction of the pension adjustments in case of increasing contribution rates.⁶ Altogether, the sustainability gaps show a significant drop to 187% in 2002.⁷

As our results in Figure 1 show, the sustainability gap was extremely volatile over time. It seems to be evident that the participants of the German pension system strongly react to the political parameters imposed by the policy makers. However, note that, after more than 40 years of reforming the pension system, we quasi return to our point of departure: comparing the sustainability gaps of 1957 with the year 2000 results in an almost identical amount of unfunded payment commitments. We should like to emphasise that the whole system, in spite of similar sustainability gaps – 336% in 1957 and 308% in 2000 – has been significantly extended during this period. This conclusion is stressed by the fact that the overall expenditure to GDP ratio was 6.5% at the beginning of our time series and has increased to 10.5% in 2000.

It is important to mention that policy makers are apparently much more anticipatory than generally assumed. Another look at Figure 1 indicates decreasing sustainability gaps since 1975, with the exception of the macroeconomic shock of the German reunification. If one abstracts from this event, we observe a constant diminishing trend. In other words politicians seem to take a sort of medium-term sustainability of the PAYG-system into account and are not blind – as some might assume – to future demographic changes.⁸

Actual developments and future reforms

The latest reform efforts of 2004 led to the introduction of the sustainability factor, effective since 2005. This factor reduces the pension adjustment according to the development of the ratio of retirees to contribution payers. This yields, under the given population projections, a long-term reduction of the benefit level of about 13% in 2050.

Figure 2 illustrates the effects on sustainability of financing the German pension system. The sustainability gap quantifies the actual reform. Without the sustainability factor the gap amounts to 188% in the projection year 2003. The enactment of the sustainability factor reduces the sustainability gap by about 70 percentage points. Summing up we can state that the actual reform marks a substantial step towards sustainability. With only 118% left, the German pensions system today faces a situation with the lowest unfunded payment obligations to future generations since 1957. Overall, we find that policy makers

⁶ However, this effect is not considered in our results since we assume – according to the method of generational accounting – that the contribution rates remain constant on the level of the respective projection year.

⁷ Note that the deductions for early retirement implemented in 1992 also affect this result.

⁸ See Borgmann and Heidler for a closer look at the impact of future demography on the generosity of the German pension system. Cf. C. Borgmann, M. Heidler: Demographics and Volatile Social Security Wealth: Political Risks of Benefit Rule Changes in Germany, in: CESIFO Working Paper No. 1021, 2003.

have been quite successful in consolidating the pension scheme. However, as another plausible reaction to the still increasing life-expectancy, postponing the regular retirement age from 65 to 67 years would lead to a further reduction of the sustainability gap amounting to another 23 percentage points, also illustrated in Figure 2. Considering the fact that the method of generational accounting does not allow changing contribution rates and federal subsidies in the projections, this remaining gap of 95% of the GDP presumably overestimates the real sustainability gap of the pension system.

Since the actual legislation already specifies an upper bound for the contribution rate in the year 2030 of 22%, higher revenues due these increasing contributions and also rising federal subsidies can be expected. In addition the increasing contributions lead to reductions in the pension adjustment. Violating the usual projection assumption of an unchanged extrapolation of the status quo, we computed a scenario considering these effects. Our calculations result in a sustainability gap of about 20%. Taking these probable changes into account, one could conclude that today's pension system is already very close to be sustainable.

Figure 1
Sustainability Gaps of the German Pension System
 1957-2002

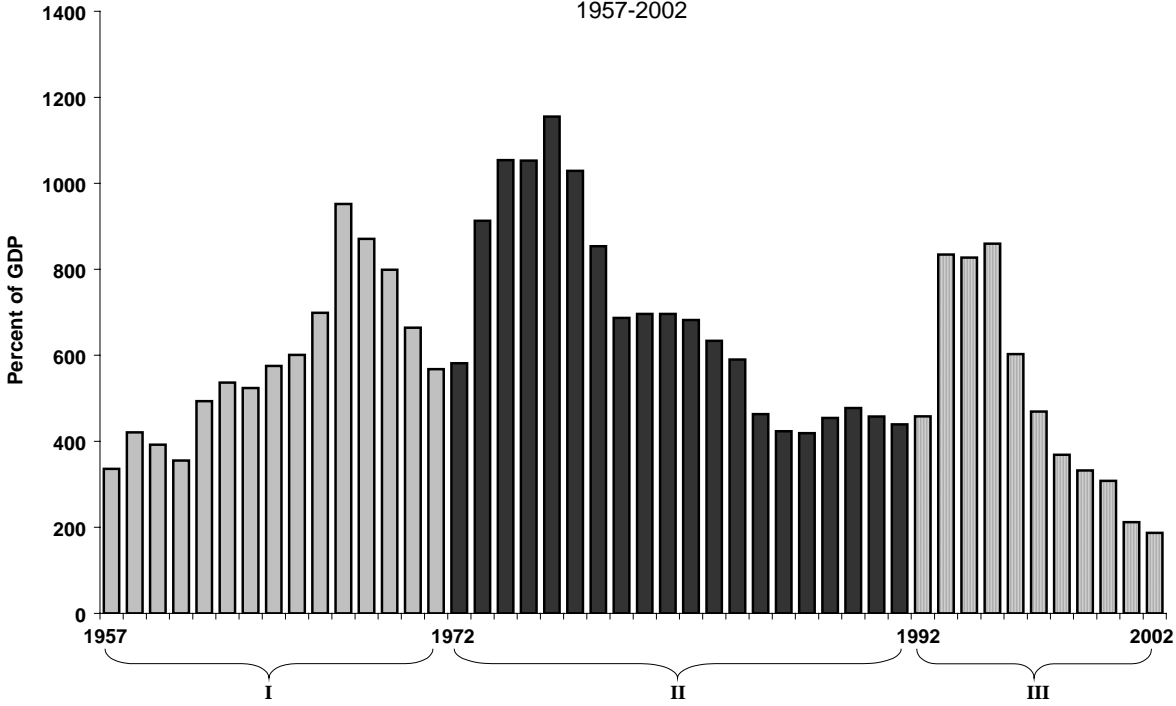
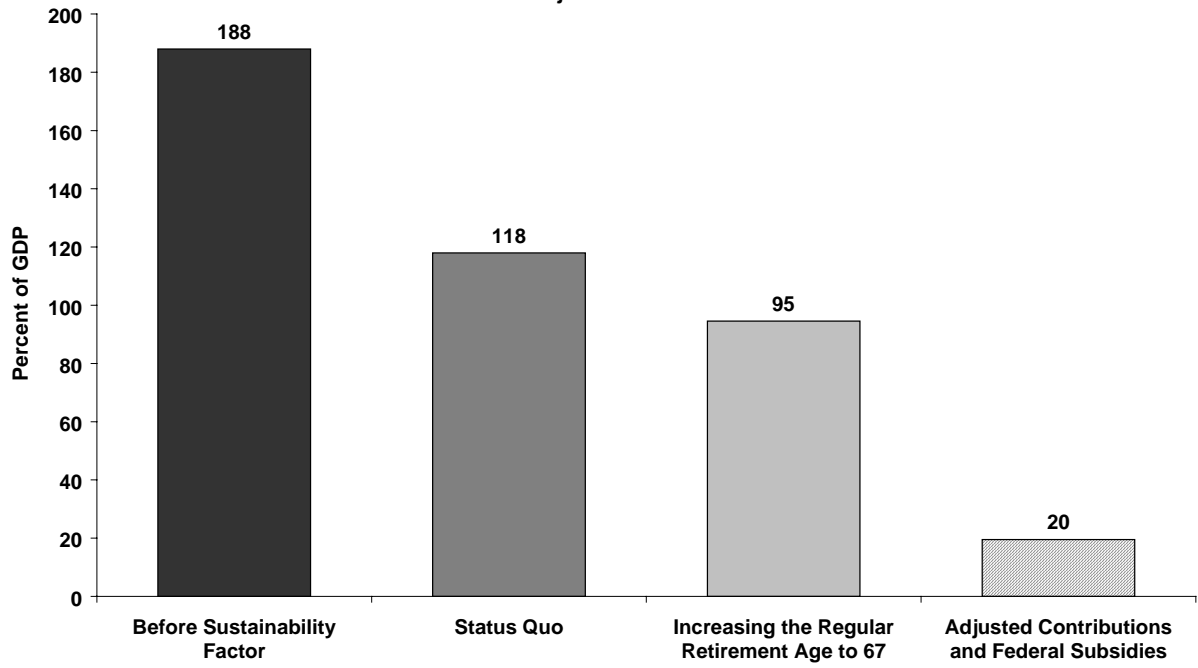


Figure 2
Sustainability Gaps: Status Quo and Outlook
Projection Year 2003



Seit 2005 erschienene Beiträge

- No. 1 Christian **Hagist**/Norbert **Klusen**/Andreas **Plate**/Bernd **Raffelhüsch**
Social Health Insurance – the major driver of unsustainable fiscal policy?
- No. 2 Stefan **Fetzer**/Bernd **Raffelhüsch**/Lara **Slawik**
Wie viel Gesundheit wollen wir uns eigentlich leisten?
- No. 3 Oliver **Ehrentraut**/Matthias **Heidler**/Bernd **Raffelhüsch**
En route to sustainability: history, status quo, and future reforms of the German public pension scheme?

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