

A fiscal outlook for Poland using Generational Accounts

– *Non-technical Summary Version* –

Discussion Paper

First preliminary draft 14 June 2010*

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Abstract

During the next few decades the populations of most developed countries will grow older and older as a result of the low fertility rates since the 1970s and/or the continuously increasing life expectancy. Poland, one of the biggest countries in Central Europe, will be confronted rather severely by this development. Generational Accounting which was introduced in the early nineties, can illustrate the effects of this ageing process on a country's fiscal situation. We show that the demographic development produces a major problem for the long term stability of Polish public finances. In particular the healthcare system deserves special attention for policy makers in the medium and long run, whilst the general pension system shall stabilise in the long term.

* We would like to thank Tomasz Jędrzejowicz, Joanna Stachura, Pawel Strzelecki, Anna Wronka, Iga Magda, Arne Leifels, Christian Hagist, Jasmin Häcker, Stefan Moog and Johannes Vatter for valuable comments. All errors remain our own.

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1. Introduction

“Insolvency” has recently become a standard expression in the media. However, this time the reference is not (only) made to the business sector but in fact to European governments. Clearly, the trust in the stability of public finances has been severely crumbled in recent months translating inter alia into considerably higher financing costs on the capital market. The current economic downturn will be a challenge for public finances in the years to come. Though, another challenge is gradually arising which will – probably even more – profoundly and for a much longer time-span affect government finances: the ageing population. Poland, one of the biggest countries in Eastern Europe, will be confronted rather severely by this development. No other EU country (except Slovakia) will experience such a rapid rise of the number of elderly people relative to the working population. This process can have severe consequences on the stability of public finances via increasing age-related social benefits burden imposed on a shrinking working population. Against this background the question arises whether the Polish fiscal system can be sustained in the long term? Traditional methods of cash/accrual deficit and nominal debt measures focus only on the current development of fiscal situations. Therefore, long term stability indicators have to be chosen to answer this question. This study provides a sustainability assessment of the fiscal system, applying, for the first time for Poland, the methodology of Generational Accounting (GA). On this basis we aim to bridge to some extent the gap of sustainability examinations for Poland. The methodology of GA was developed initially by Auerbach, Gokhale and Kotlikoff (1991, 1992 and 1994), who sought to illustrate the effects of intergenerational policy. After all, probably nearly every piece of legislation affects not only living but future generations as well. Since the early 90s GA has become a broadly recognized method to measure fiscal sustainability. For the last 15 years several GA studies for 29 different countries¹ have been added to today’s literature. Some countries like Norway even include Generational Accounts in their government reports.

With this study we aim to provide not only an assessment of the sustainability of the overall Polish fiscal system but also of its smaller subsystems. On this basis we seek to evaluate which isolated subsystems cause the biggest threat to the stability of Polish public long term finances. Therefore, we modified the usual approach based only on analyses of entire public finance sector, by dividing it into the smaller subsystems: pensions of various kinds (e.g. of ZUS, civil servants and of KRUS), disability and survivors benefits, healthcare, and education.

Besides the analysis of intergenerational burdens this study aims to outline the need for action. A number of reforms have been introduced in past years such as e.g. the profound pension reform of 1999. At present already new modifications of the pension system are discussed. Against this background we want to assess whether the sweeping 1999 pension reform was sufficient to ensure fiscal sustainability of the ZUS pension fund? One focus of this study shall, therefore, lay on

^{*1} 15 of these countries have been estimated in cooperation with the RCG.

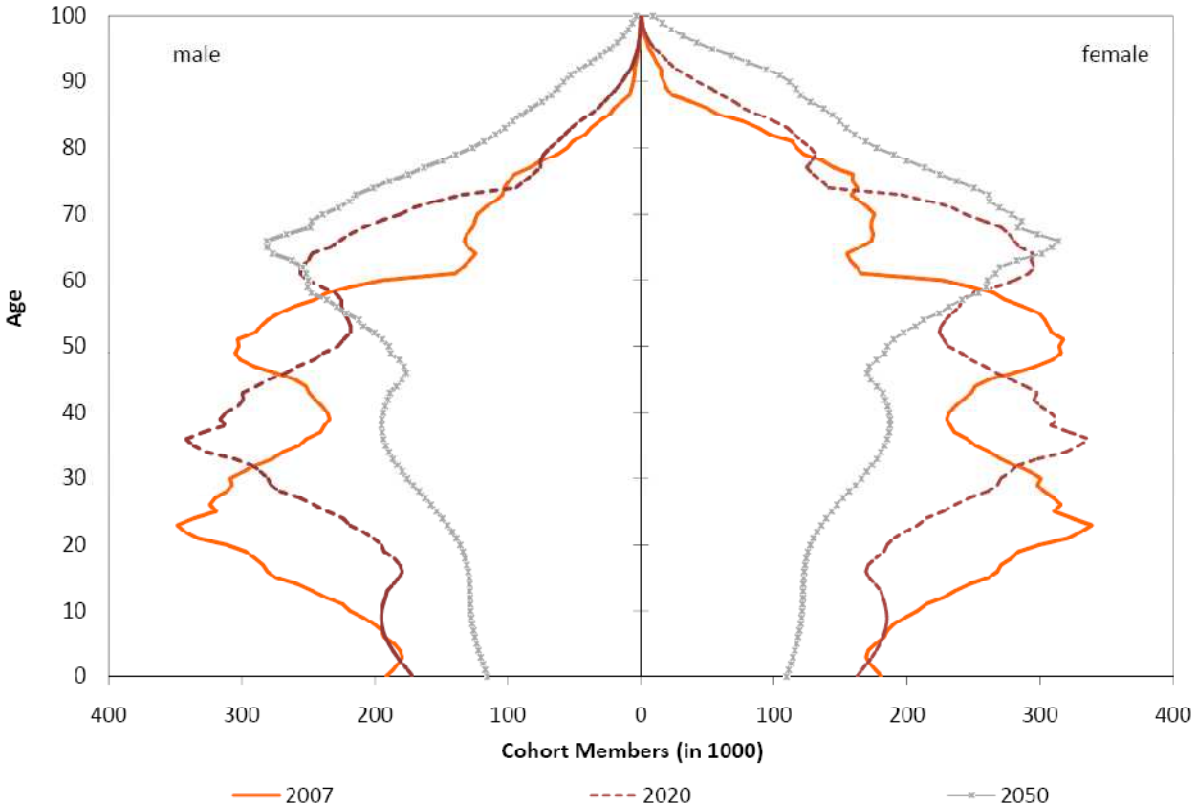
the evaluation of the reformed general pension system based on the new notional defined contribution system (NDC). Due to the complexity of this reform we deviate from the standard GA approach of projecting present benefit and contribution profiles into the future. In fact, we compute future NDC pensions on the basis of actual NDC accounts, altered retirement probabilities and changing (age-specific) participation rates in the new NDC-system. Furthermore, we aim to take into account for the case of Poland transformation specific features such as a conversion of the farming sector.

This non-technical summary follows closely the full version of our discussion paper, however, some parts such as the detailed discussion on the data and methodology applied as well as the in depth description of fiscal sub-systems is omitted. The following pages are structured as follows: chapter 2 describes briefly the demographic development of Poland. With chapter 3 we provide the results of the Generational Accounting analyses using different kinds of sustainability indicators. Furthermore, we compare the long term stability of fiscal subsystems such as ZUS, KRUS and public health care (NFZ). Chapter 4 summarizes the paper giving additionally an outlook on future research.

2. Demographic development in Poland

Figure 1 illustrates our population projection – a main basis for our GA calculations. Often demography reflects to a great extent the history of the respective country. This becomes apparent when looking at Poland’s age specific population structure in the base year 2007. First of all, one can clearly identify the impact of World War II on the cohorts born between 1941 and 1946. As commonly observed during periods of war and unrest, birth rates were relatively low, resulting in relatively small cohorts aged around 60 in 2007. After the end of World War II the fertility rate recovered quite rapidly which led to strong cohorts aged 45 to 60. During the 1960s and 1970s the total fertility rate decreased from nearly 3.0 to 2.2 children per woman. This explains the drop in the birth rate which can be observed around the age group of 40 in 2007. The subsequent gains in birth numbers can be traced back to the fact that the respective cohorts have been born by those aged 45 to 55 in 2007. Due to the fact that these are quite large in numbers, their children are numerous as well. After the opening of the Iron Curtain in 1989, however, Poland displayed a steep fall in natality—as in most formerly communist countries.

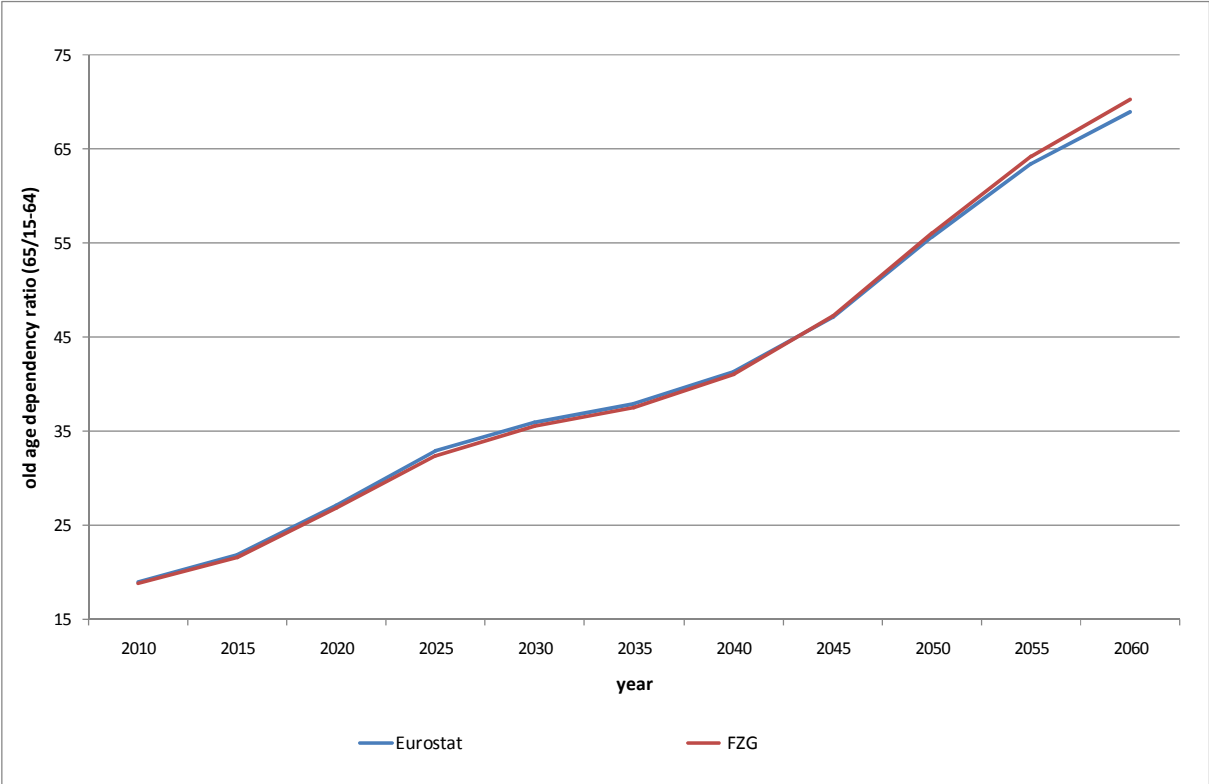
Figure 1: Structure of Polish population



Source: own calculations based on Eurostat data

In order to project Poland’s demographic future, assumptions about fertility rates and life expectancy for the coming decades are needed. In accordance with most other population projections such as EUROPOP (conducted by Eurostat) we assume that the fertility rate will remain on its low present level of roughly 1.3 children per woman. The assumed evolution of life expectancy in Poland is broadly similar to the rest of Europe. While an average male (female) born in 1990 could expect to live for 66.3 (75.3) years, this value is assumed to rise to 71.0 (79.7) for a male (female) born in 2007. In comparison to most other EU countries this increase in life expectancy by almost four months per year is particularly fast. According to Eurostat (2009) life expectancy of a male (female) newborn will further increase by around eight (five) years until 2050.

Figure 2: The development of the age dependency ratio in Poland



Source: own calculations

Both declining fertility rates and the ongoing and rather steep increase in life expectancy lead to a bold double aging process in Poland. As a result, the Polish population pyramid’s appearance will considerably change in the coming decades (see Figure 2). The pace of this aging process is exceptional—compared with other European countries. This can be illustrated by the old-age dependency ratio, defined as the number of persons aged 65 and older, relative to those between 15 and 64. As illustrated in Figure 2 this indicator will rise from about 20 percent in 2010 to roughly

70 percent in 2060, which is a steeper increase than in any other EU country except Slovakia.² A demographic development of this kind can put substantial pressure on Polish social security systems which are mostly based on pay-as-you-go (PAYG) systems. The following chapter shall, therefore, assess the impact of this ageing process on the sustainability of Polish public finances.

3. The sustainability analyses of Polish public finances

With this chapter we want to answer the following core questions framework of our study: Can the present Polish fiscal policy be regarded as stable in the long term? And if not, which fiscal sub-systems are the main drivers for this fiscal unsustainability. To answer this question we first of all derived age- and gender-specific revenue and expenditure profiles from micro data. These fiscal flows have been then projected into the future considering the demographic development described in chapter 2. In this framework also various fiscal reform such as the profound 1999 pension reform or the disability reform have been taken into account. Furthermore, transformation specific features, namely the shrinking of the farmers and miners sector have been considered. A more detailed description of our methodology and computation procedures is given in the full version of our study. In the following chapter we shall only illustrate the major results from our computations.

3.1. *Fiscal gaps and sustainability indicators for Poland*

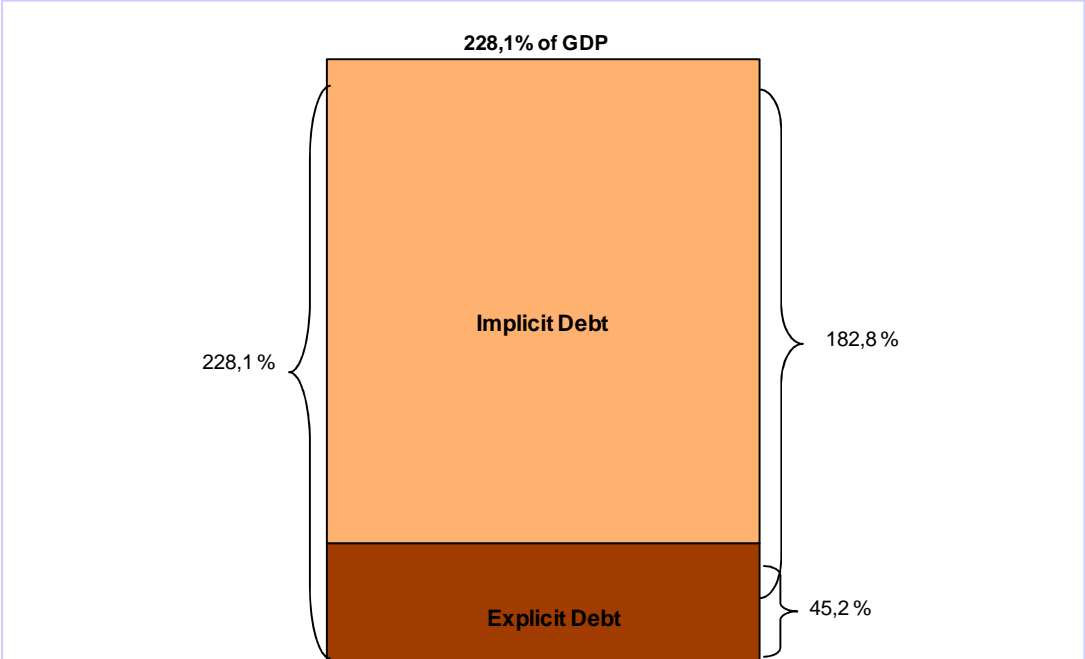
One important indicator to describe the long term stability of public finances represents the *sustainability gap*. This indicator is akin to the debt quota well known since the Maastricht treaty but it addresses the debt which will occur in the future and in the past. In other words in addition to the explicit debt it also considers implicit debts of government finances. In most OECD countries the latter debt category arises if their present fiscal policy is not sufficiently prepared for the upcoming ageing process. We therefore comprised all future budgetary deficits in our computation of the sustainability gap. Besides the ageing process also deficits in the base year – which are projected into the future – can lead to a sustainability gap. Generally, this gap can be interpreted as the amount of money to be set aside in the base year to sustain present fiscal policy in the long run.

Our calculations show that the explicit debt of 45% in the base year 2007 is only the “top of the iceberg” of Polish government debts. In fact, the current fiscal policy bears an additional implicit debt of about four times the explicit debt of the base year GDP (183 %). Overall the sustainability

² As Figure 2 outlines our demographic projection follows relatively closely the forecast of Eurostat. Only in the very long term we slightly deviate from this benchmark population projection.

gap of Poland amounts to 228 % of GDP in 2007.³ The message is clear: Polish public finances are not sustainable! Even after the profound reform measures of recent years the fiscal system cannot be continued in the long run and certainly further reforms are needed in the light of a rapidly ageing society. Of course, the results are accompanied with a considerable amount of uncertainty, especially regarding the growth and discount rate but also concerning the demographic development. Nevertheless, the sensitivity analysis indicates that the qualitative conclusion does not change if reasonably different presumptions are taken.⁴ Also in these cases the present Polish fiscal policy is not sustainable.

Figure 3: Sustainability gap for Poland, $g=1,5\%$, $r=3,0\%$, 2007, % of GDP



Source: own calculations

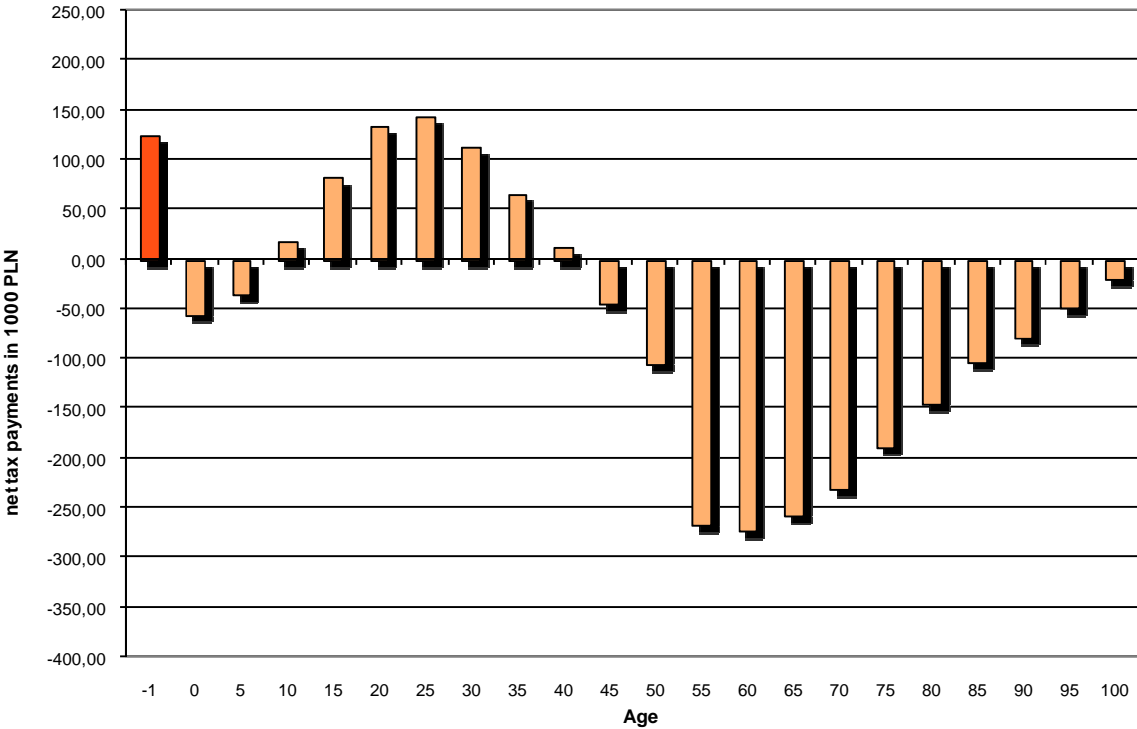
An indicator illustrating the intergenerational burden is the *future generations' burden*. With this indicator we assume that the sustainability gap (see Figure 3) is closed only by future generations – born after the base year. The “-1 year old” shown in Figure 4 is a representative of these future generations. His generational account amounts to roughly 130,000 PLN. This value reflects the sum of all contributions and taxes this individual pays minus all transfers he/she receives over

³ Since our study is the first to analyze the sustainability of Polish public finances with the method of GA, the comparability with other studies is possible only to a small extent. The cross country comparison is also difficult. While the 2007 base year applied in our case is relatively ‘fresh’ (2007), available studies for other countries end up at updates for the base year 2005. In a future update of this study we would like to give such a cross country comparison which could base on preliminary work of the RCG, see e.g. Hagist et al. (2009) or Moog et al. (2010).

⁴ The sensitivity analysis is given in the annex of the complete study.

his/her life cycle (in present value of 2007). Comparing the generational account of “-1 year old” with the respective account of the “0 year old” can reveal the intergenerational redistribution of current fiscal policy. In the case of Poland a newborn after the base year has to bear an additional fiscal burden of about 180.000 PLN.⁵ In other words this future newborn would have to pay 180.000 PLN more than the “zero year old” over his remaining life cycle. But here it should be again underlined, that by applying this indicator we assume the sustainability gap is ‘only’ closed by future generations.

Figure 4: Future Generations’ Burden for Poland, g=1,5%, r=3,0%, 2007



Source: own calculations

A further indicator, the *revenue gap* gives an answer to which extent an increase in taxes and other revenues can close the sustainability gap. In the case of Poland in 2007, revenues (for present and future generations) needed to be increased considerably by 12% in order to guarantee a sustainable fiscal policy. The other final indicator to be analyzed is the *transfer gap*. It shows to which extent general government transfers should be trimmed to close the sustainability gap. According to our estimates benefits (of present and future generations) have to be reduced by 11% to close the sustainability gap. Also these indicators illustrate that there is need for fiscal changes to stabilize Polish public finances in the long term.

⁵ This number is simply derived by subtracting the Generational Account of the „zero year old“(-55,000 PLN) from its counterpart born one year after the base year (125,000 PLN).

3.2. The main drivers of Polish unsustainability – isolating fiscal subsystem

The sustainability gaps of isolated sub-systems give a better picture of the main drivers for the Polish overall implicit debt. The gaps for our *standard isolation approach* are illustrated in Figure 6. Looking at this chart, first of all its interpretation should be made clear. These gaps were elaborated with the assumption of a lack of external financing. In other words e.g. for the case of ZUS only pension contributions paid and pension benefits received have been considered. The significant amount of tax inflow into ZUS in the base year has not been taken into account. We shall therefore start the discussion of the results in Figure 6 with the systems which depend in the base year to a large extent on external financing: ZUS, farmers and miners.⁶ For these systems the isolated gaps indicate that they will also in the future depend heavily on tax inflows – if no mayor reform steps are taken.

In the case of the ZUS old age pension system the considerable mismatch of contributions and expenditures in the coming decades bears a challenge for the Polish fiscal policy. These transformation costs of the 1999 reform – described more closely in box 1 – explain mainly the large sustainability gap of about one times the base year GDP. It should be underlined here that in the long run – as showed in box 1 – contributions can almost cover expenditures in the ZUS pension system.

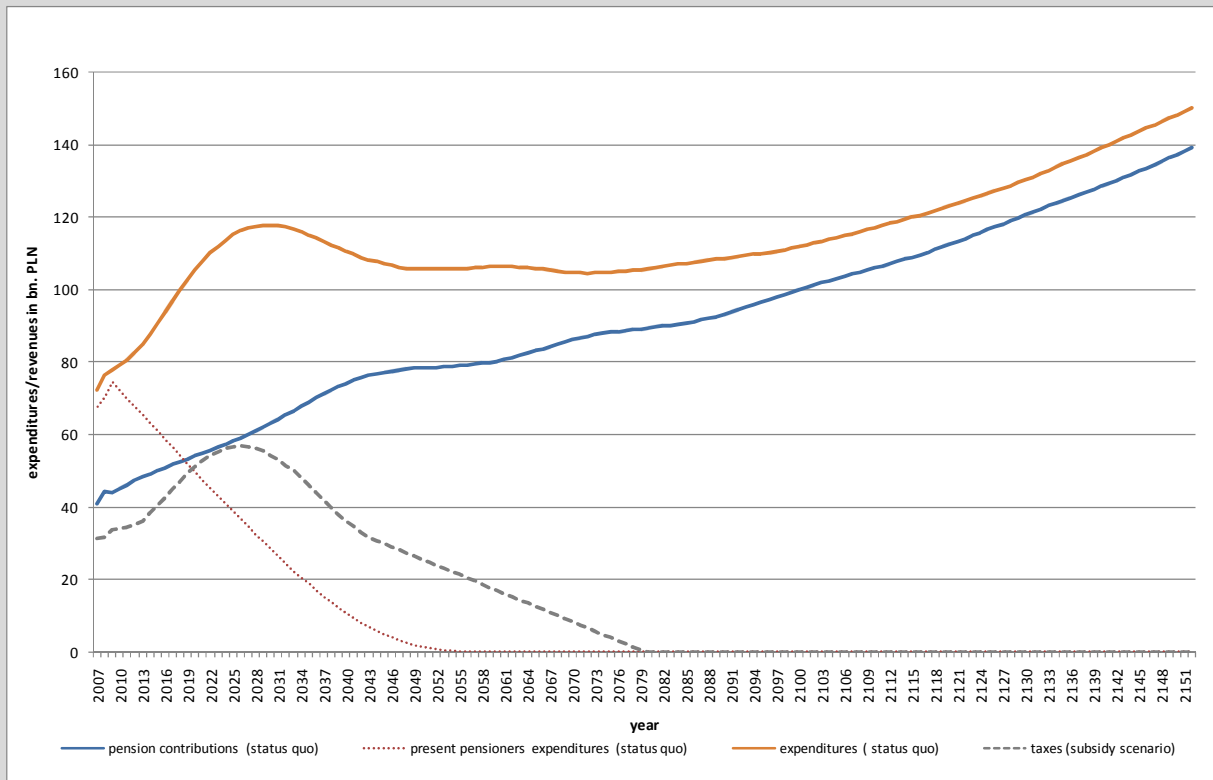
Box 1: Long phase out of the pre1999 pension system

The profound pension reform of 1999 will be phased in over a relatively long period of time. The old system is phased out to a large extent when present pensioners have died. As Figure 5 depicts after 2053 no expenditures arise from present pensioners in the base year. However, also after this year retirees receive a bit higher pension due to the fact that they have paid more than 12,22 percent in contributions. Hence the system is not phased in completely until the last pensioner of this category has died – which is roughly the year 2080.⁷ Until this point in time relatively high pension entitlements have to be financed by low contributions of 12,22 percent. Hence, one could legitimate a inflow of tax money until the year 2080. The tipping point is whether the present pension system still runs large deficits after it is fully phased in. The answer is given in the following Figure 5. It shows the expenditures and revenues until 2150. This is, of course, a long projection period, so the results should be taken with caution due to a very great level of uncertainty about the longer future. Besides the phase out of present pensioners of the base year also a subsidy scenario is given. In this scenario we assume that the double burden of the pension system is financed via taxes until the system is fully phased in. Thereafter no taxes are paid to ZUS.

⁶ The education and civil servants system which are entirely financed by taxes will be tackled later.

⁷ From the year 2053 until 2080 we apply a linear phase out.

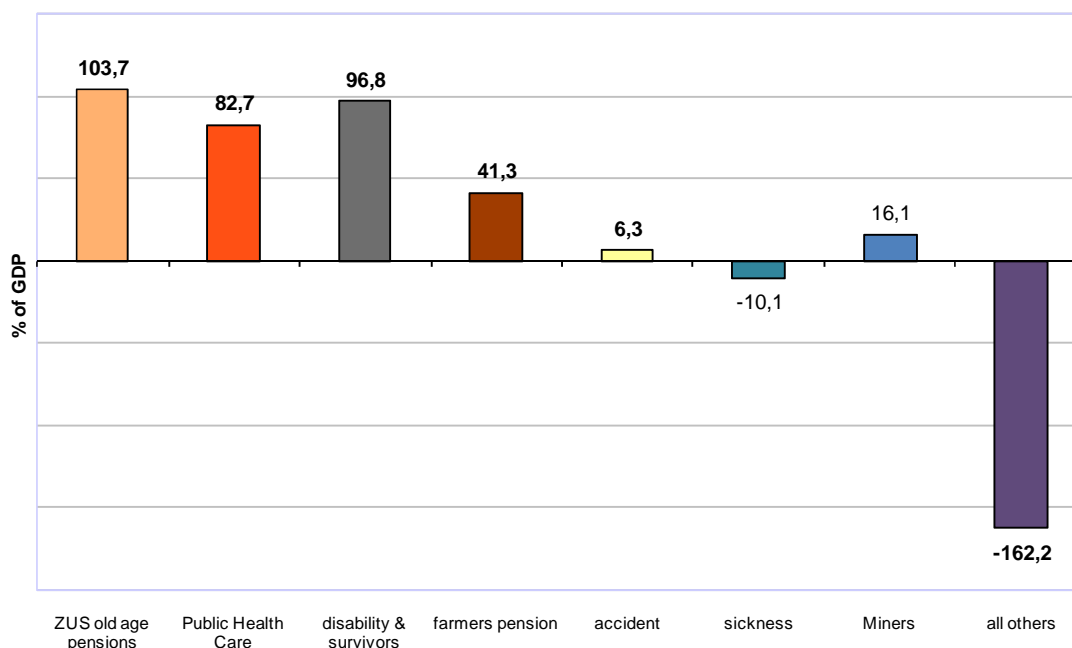
Figure 5: Required subsidies until the phase out of the pre1999 pension system



The figure makes clear that the present level of tax inflow into ZUS is not necessary in the long run. But it is also obvious that ZUS still runs a deficit after the (full) phase in of the 1999 pension reform. This indicates that further reform measures might be required in the longer run if deficits shall be avoided.

In the case of farmers and miners these fiscal systems would generate a significant sustainability gap if external financing would not be prolonged in the future. The farmers system would accumulate a sustainability gap of 41 and the miners system of 16 % of the base year GDP. The message from this exercise is that despite the future shrinking of the miners and farmers sectors also in coming decades their entitlements have to be financed to a large degree by tax inflows.

**Figure 6: Isolated Sustainability Gaps of the parafiscal and other subsystems
– standard isolation approach –**



Source: own calculations

What becomes clear in Figure 6 is that especially the health care and disability system “contribute” to the long-term instability of Polish public finances. If we project the contribution and expenditure structure of the base year into the future the disability system would generate a sustainability gap of nearly 100 % of GDP. We will see later that this isolated gap is mainly caused by the deficit in the base year. For the health care system the implicit debt amounts to about 80 % of GDP. Here it should be noted that the latter system bases on relatively conservative assumptions. In case of the so called cost pressure scenario the public health care system could even turn out be the most unsustainably of all systems (see box 2).

Box 2: The scenario of medical-technical progress

Current literature reveals that the rise in health care expenditures can only partly be attributed to the ageing process, see e.g. Dormont et al. (2006). Some research such as Breyer und Ulrich (2000) show that it is also determined by the so called *medical-technical progress*. This judgment bases on the assumptions that innovations occurring in the health care sector are relatively one-sided. Generally it is assumed that costly product innovations dominate cost-saving process innovations.⁸ With the effect that the healthcare system is

⁸ See Zweifel (2003).

able to offer new, and often costly methods and tools to cure diseases. However, due to a lack of process innovations it is lagging behind the efficiency of other sectors in the economy. As a result (per capita) health care expenditures tend to grow at a faster pace than the general productivity growth. Breyer und Ulrich (2000) estimate for Germany a growth-differential of 1 %. Hagist and Kottlikoff (2009) calculate for 10 OECD countries a growth differential of at least 1 %.

For our computations we assume in the *medical-technical progress scenario* – also called *cost pressure scenario* – a growth of medical expenses per capita which lies one percent above the general economic growth. However, we limit this higher growth path until the year 2040. After this point in time health care expenditures follow our standard growth assumptions in the long run. The rationale for this time limit is a logic one: If we are not limiting the higher growth path, health care expenditures would outweigh the Polish GDP in the long run.

Only the isolated sickness fund can generate a wealth over the coming decades. This is mainly due to the future decrease of its beneficiaries. Most benefits of the sickness fund are paid out to the shrinking working population.

Projecting the residual of all other parts of Polish public finances into the future would imply a significant implicit wealth of about 160 % of the base year GDP – see bar ‘all others’. This stems mainly from the fact that in the standard isolation approach we did not consider any tax inflows. This significant amount of tax revenues – reflected in the bar ‘all others’ – is more than enough to cover the expenses of the residual parts of public finances. Of course, policy makers in the future can decide how to use this tax money, e.g. to cover the transformation costs of the pension system or to finance the increasing health care expenditures? Nevertheless, under the present fiscal rules one thing seems obvious: future tax inflows will not be sufficient to cover the sum of all isolated sustainability gaps. Summing up all isolations given in Figure 6 the overall implicit sustainability gap of Polish public finances still amounts to about 180 % of the base year GDP.

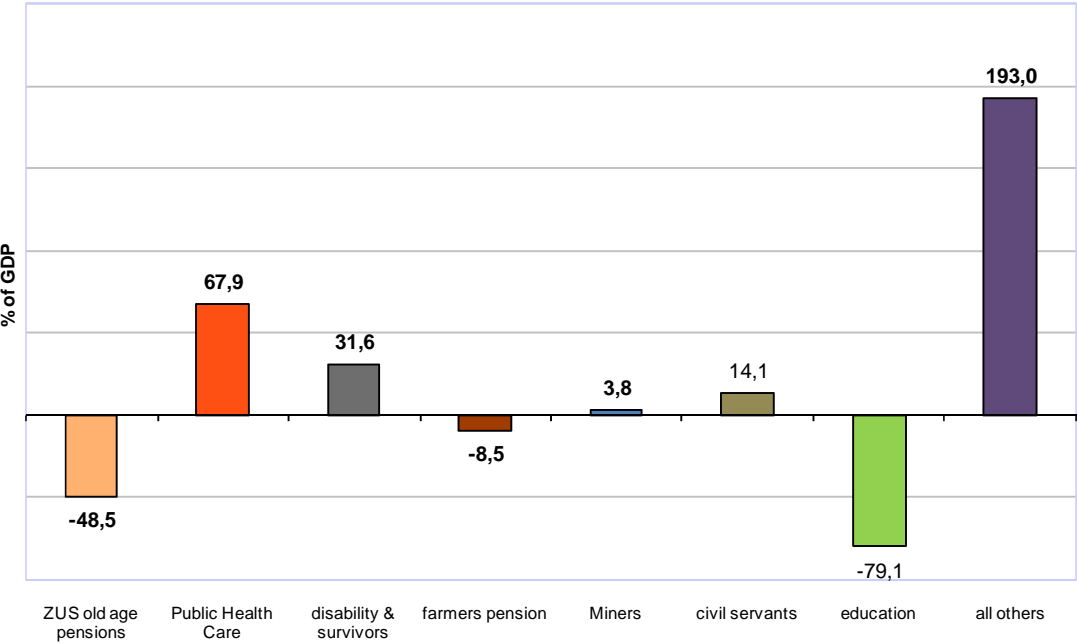
At present some fiscal systems are financed to a large degree by the state budget. So the crucial question is whether we should project this tax inflow, too, when isolating the respective fiscal system into the future. According to the legal rules of the status quo there is no binding and clear rule that deficits shall always be covered by the state budget.⁹ Therefore, we do not include tax inflow, and any other form of additional financing in the standard isolation scenario. But is this a politically realistic scenario? Most probably, also in future budgetary years one will observe large tax inflows into ZUS and other fiscal subsystem such as the farmers and miners system. Therefore, we apply a second isolation approach in the following Figure 7. Whilst Figure 6 bases on ‘pure’ own resources, Figure 7 assumes a balanced cash budget in the base year for each

⁹ E.g. in the case of ZUS the deficit can also be covered from other sources: short term loans from the banks or expected one-off capital injections from the Demographic Reserve Fund.

isolated subsystem. In other words we disregard the mismatch of contributions and expenditures in the base year in the *balanced budget approach*. The aim of this scenario is first of all to examine whether the present additional revenue inflow will also be required in the long term. E.g. in the case of miner we intend to analyse whether the present tax inflow will be sufficient to guarantee the fiscal long term stability of the miners social security system. Of course, also in the balanced budget approach reforms as well as the ageing process and transformation specific trends are taken into account. The factor which is knowingly neglected is the respective base year deficit of the sub-system analyzed.

The balanced budget scenario also suits another aim. It helps to make the outcomes for the civil servants' social assistance system as well as education system (methodologically) comparable with other systems which rely on primarily own resources. These two systems, the education and the civil servants system, are the only isolated fiscal entities which are financed solely by taxes and not own contributions. Therefore, for these 'special' schemes it is only feasible to apply the balanced budget approach.

Figure 7: Isolated Sustainability Gaps of the parafiscal and other subsystems – balanced budget isolation approach –



Source: own calculations

It is interesting that in the case of old age pensions paid by ZUS the assumption of an unchanged level of external support transforms the ZUS's sustainability gap into an implicit wealth. In the coming decades ZUS will have to bear the double burden of 1) phasing out the generous old

system and 2) additionally lowering the contribution basis (from 19,52 % to 12,22 %). However, after this unpleasant transformation period contributions can almost match expenditures. In other words, after the year 2028 the government supports for ZUS can be most probably gradually reduced. If this is not the case – as assumed in Figure 7 – ZUS would generate a considerable wealth of about 50 % of the base year GDP.

If policy makers decided to keep the large financial support to miners from the base year, the ‘virtual’ miners’ subsystem would be almost balanced overtime despite the ageing process. We explain this sustainability improvement by the gradually decreasing number of working miners. On one hand the present per capita tax inflow into the miners social security system is not needed since there will be simply fewer participants in this sector. However, on the other hand this trend cannot totally outweigh the increasing burden of the ageing process. We still assess a though relatively little instability in the long term.

In case of the healthcare system, which is almost balanced in cash terms in the base year – but for relatively small part of missing contributions paid for certain groups, like farmers – the lack of stability remains almost unchanged. The drop of around 10pp. does not firmly improve the poor financial prospect of the healthcare system. We shall remind in this place probable cost pressure scenario, which doubles the expected implicit fiscal burden of the public health care system.

Contrary to the healthcare system, the disability fund can substantially improve its long term stability in case of the balanced budget scenario – by 60pp. of the base year GDP. This stems from the fact that the disability fund showed a significant deficit in the base year. Of course, when neglecting this mismatch of contributions and expenditures in the long term stability of this system improves. Nevertheless, still a considerable sustainability gap of 32 % of the base year GDP remains.

We can, furthermore, see that if the government support to farmers remained unchanged the fund would indeed significantly gain stability. In other words, with the gradual outflow of farmers from this system, the present government support would be more than sufficient in the long term.

Civil servants social benefits’ scheme and education were already based in the first place on the assumption of a balanced ‘own’ budget in the base year (for an explanation see the respective chapters). The sustainability gap of civil servants is relatively remarkable considering its low share of overall government expenditures in the base year (about 2,5%). The perspective of the education system turns out to be relatively promising. Contrary to the other system it can generate a remarkable “demographic dividend” due to the ageing process. More precisely, the expected low fertility rates which translate into fewer pupils will generate considerable savings in the future.

Coming to a conclusion, a closer look on the isolated fiscal systems has shown that the stability of the subsystems of public finances is relatively heterogeneous. Especially the health care system but also the disability system turns out to be rather unsustainable. In the standard isolation

approach we do not consider external financing such as taxes since the legal status quo gives no rules to project these extra revenues. If we however, deviated from this approach and give as a reference the balance budget scenario further information can be derived about future public finances. On this basis we could show that the present values of tax inflow into the education system but also into the general pension system will not be required in the long run.

6. The conclusions and outlook

In coming decades Poland will be severely confronted by an ageing population. No other EU country (except Slovakia) will experience such a rapid rise of the number of elderly people relative to the working population. With this study we aimed to assess the impact of this ageing process on the long term stability of Polish public finances. Within this context we wanted to address the question whether recent fiscal reforms – and in particular the profound pension reform of 1999 – are sufficient to prepare Polish public finances for the upcoming ageing process. In comparison to other GA studies we, furthermore, aimed to focus on a special characteristic of the Polish economy: the ongoing transformation process. When analyzing the fiscal system of Poland one has to bear in mind that the past shrinking of the farming and mining sector can be most probably also observed in coming decades. We, therefore, tried to comprise such transformation specific features into our computations.

Looking at the overall fiscal system the results are clear cut: Polish public finances are not sufficiently prepared for the upcoming ageing process. If present fiscal policy would be prolonged into the future considerable debts are accumulated. Due to our calculations the fiscal gap of the entire public finances amounts to 228 % of GDP (in 2007). This number can be interpreted as the amount which would have to be set aside today in order to sustain the present fiscal policy in the future. Of course, one can argue that this outcome is rather sensitive to the chosen assumptions: mainly the discount and the growth rate as well as the demographic presumptions. The authors are, therefore, very open to a debate on the quantitative results. Nevertheless, one might twist and turn the assumptions; the qualitative statement remains the same: present Polish fiscal policy is not sustainable.

A closer look on subsystems is highly valuable. It illustrates which fiscal systems are the main drivers for the unsustainability of public finances and which systems are prepared for the upcoming ageing process. We started our analysis with the general pension system – the biggest item of Polish public finances. Due to our calculations the comprehensive pension reform of 1999 remarkably improved the fiscal long term stability. The virtue of the new NDC system – in terms of sustainability – is that it automatically adjusts pension benefits to the future demographic development. On the basis of the 1999 reform future expenditures can be almost entirely covered by future contributions. However, this statement only holds in the (very) long-term! The challenge for policy makers lies in the coming 20 years. In this period the increase of total pension

expenditures will be considerably higher than the growth of pension contributions leading to an increasing deficit of ZUS – see standard scenario, Figure 8 below.

Figure 8: ZUS development of pension revenues & expenditures cumulated effect of reforms' scenario (g=AWG, r=0)¹⁰



Source: own calculations

The reason for this development lies in the “quadruple burden”: 1) high pension entitlements of the old generous pension system 2) for an increasing number of elderly people have to be paid by 3) lowered contributions of a 4) decreasing number of contributors. In other words, ZUS will require a considerable and increasing amount of additional inflows in the nearer future. How these financing gaps of future budgetary years are bridged has to be decided by politicians. In the course of the intended accession to the EURO-zone a further considerable extension of tax inflows into ZUS is probably not desired by policy makers. Against this background our study quantified the impact of two recently discussed reform proposals brought forward by the Ministry of Finance (MoF): 1) an increase of female retirement ages and 2) a partial switch of pension contributions from the funded (FDC) to the unfunded pension scheme (NDC). We demonstrated that these reform measures can

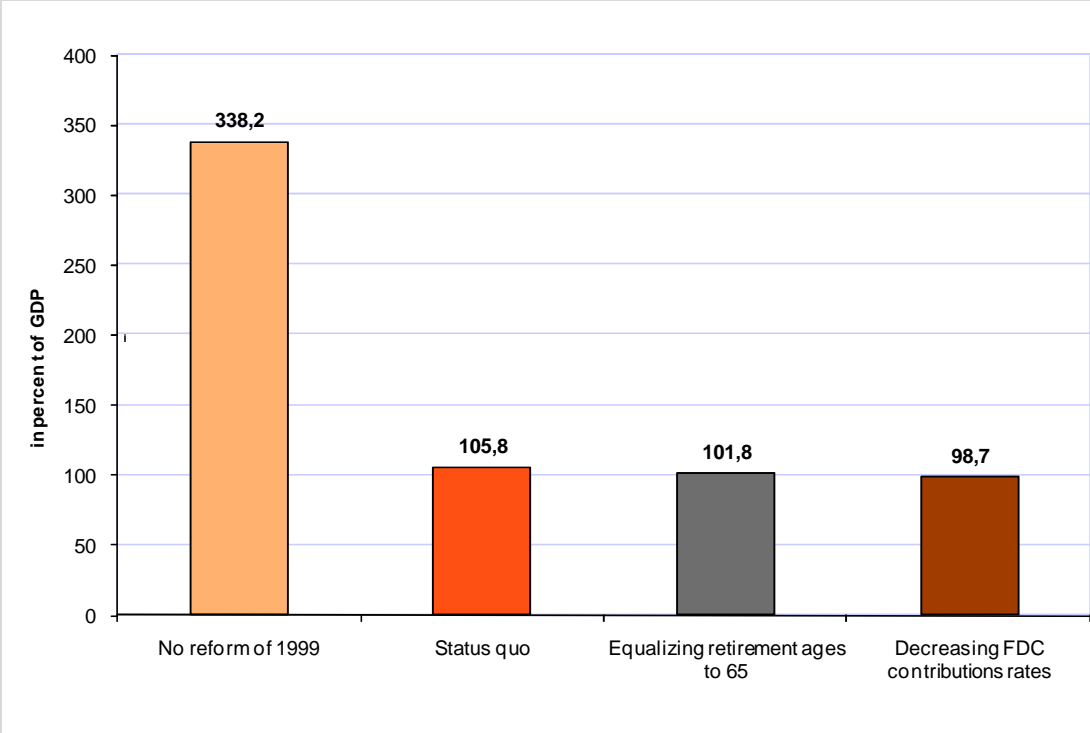
¹⁰ These revenues and expenditures reflect the ZUS old age pension system. Miners’ pensions and bridging pensions are excluded here.

partially bridge the deficits in the coming decades. Figure 8 shows the exemplarily the impact of both reform proposals combined on the development of ZUS revenues and expenditures.¹¹ It should be underlined here that the 1999 pension reform – despite its high transformation costs considerably improved the long-term stability of the Polish general pension system – see box 3.

Box 3: The stabilizing pension reform of 1999

Figure 9 shows pre- and post-1999-reform sustainability gaps together with its expected change due to a longer working period of women and a cut in FDC contributions. The chart confirms our general observations: The implementation of NDC accounts had a significant influence on the long-run fiscal stability. Especially the automatic adjustment of pension levels to demographic changes guarantees a better stability of long term pension finances. Overall the reform lowered the sustainability gap by over 230% of GDP. In other words “only” one time GDP value from the base year has to be set aside in order to finance all future deficits of old age ZUS-pension. In the no reform scenario 340% of GDP have to be put aside to run the system until infinity. As has been shown in the full version of our paper most of the implicit liabilities in the status quo scenario arise from the double burden of the 1999 reform. Figure 9 also illustrates the minor sustainability impact of the two recent reform proposals. Neither the increase of female retirement ages nor the (backward) switch of contributions from the funded to the PAYG system considerably changes the long run stability of the pension system.

Figure 9: Sustainability gaps of ZUS old age pension system in different reform scenarios
 $g=1,5, r=3,0$



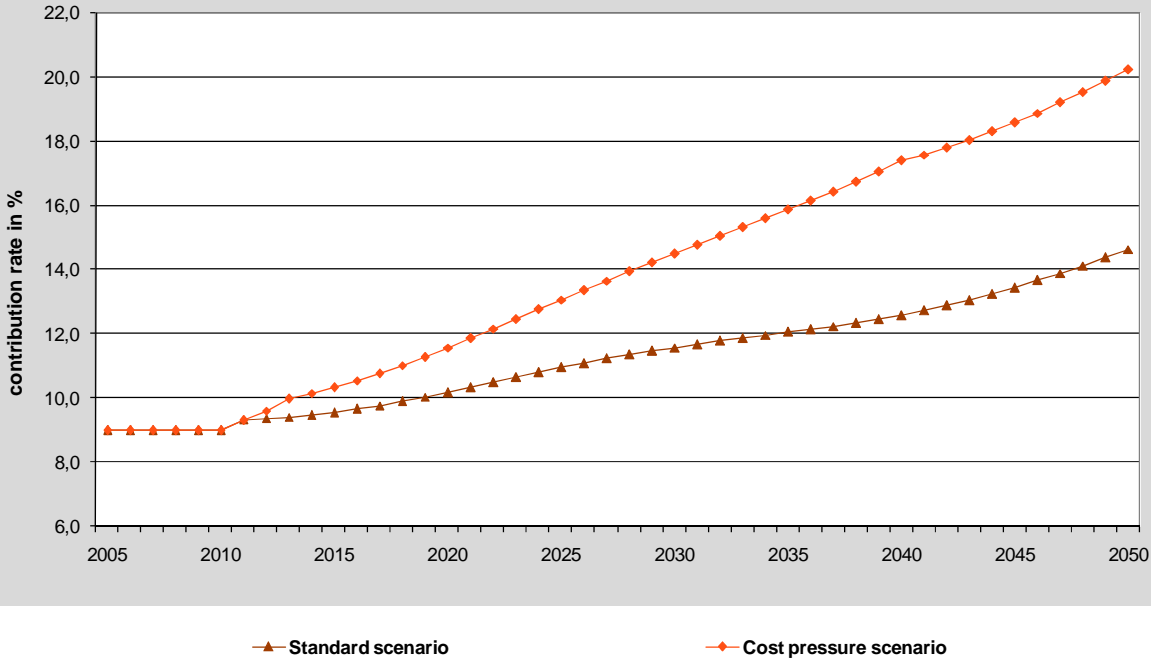
¹¹ For reasons of comparison with AWG results we deviated from our standard growth rate of 1,5 % and based our calculations on the time-varying AWG growth forecast.

One major driver for the instability of the long term fiscal system could play the public health care system. According to our estimates – which differ to some extent from the Ageing Working Group – future health care expenditures will rather considerably rise due to the rapid ageing process. The results are even more severe when considering the so called medical technical progress. In order to bridge these expenditures contribution rates would have to rise considerably in the coming decades (see box 4) Against this background policy makers will have to choose in coming decades between an increase of health care revenues – via higher contribution rates and/or extra budget funding – and/or a cut in health expenditures to close arising fiscal gaps.

Box 4: Development of health care contributions

Figure 10 shows the necessary change in nominal healthcare contribution rate, which would guarantee NFZ sustainability. In our standard scenario the raise of the contribution rate required to close the sustainability gap would lead to an increase of nominal rates from current 9% to 12% in 2035, and almost 15% in 2050. Not surprisingly, in the cost pressure scenario (for a description see box 2), the contribution rates would have to be doubled in 2042, and will keep growing to over 20% in 2050.

Figure 10: Development of healthcare contribution rate closing sustainability gap, 2007, $g=1,5\%$, $r=3\%$



Source: own calculations

Also the fiscal sustainability of the disability fund is questionable in the long run. This is to some extent caused by a cut in contribution rates which led to a significant deficit in 2009. But not only the weak revenue side could cause a future financing gap but also the increase of future expenditures – namely of survivors pensions. However, regarding the disability fund it should be underlined that our computations are limited. Due to data constraints not all aspects of the 2006 reform have been considered.

Remarkable is the influence of the expected transformation process on the Polish fiscal sustainability. Based on national estimates we aimed to project a further outflow of contributors from the farmers and miners social insurance systems into the general social security system – namely ZUS. According to our computations this transformation will improve the long-term stability of the overall public finances. The explanation lies, simply speaking, in the relative sustainability of the general social security systems to the farmers (miners) system. In coming decades a higher proportion of the population will be insured in the relatively more sustainable ZUS system and fewer citizens will participate in the relatively unstable KRUS (miners) system.

The fiscal system which can generate a considerable wealth over the future – assuming constant per capita expenditures – is the education system. It is the only subsystem – besides the accident fund – which can considerably profit from the expected demographic ageing, namely from the low fertility rates which translate into a decrease of the number of pupils. The interesting question of the coming years will therefore be: how politicians shall spend this “demographic dividend”, for an increase of (per capita) education expenditures or to cover the deficits of other fiscal systems?

The authors are well aware that this initial GA-sustainability study can only give a first picture on Polish long term public finances. Certainly, there are numerous possibilities for improvements. Therefore, we want to conclude with an outlook on future research – mainly on data improvements and possible extensions of the model.

As in every projection the quality and availability of data is rather vital for the accuracy of results. While for e.g. pension expenditures the available data was very satisfactory, this statement does not hold for various tax categories such as CIT and real estate taxes. Future research should therefore try to gather more precise age- and gender-specific micro data on these important parts of government revenues.¹² Generally, various occupation groups showed in recent decades waves of employment. As a result, the population of these professions – like e.g. civil servants – does not follow the general population structure. Due to a lack of data we could not take this into account for teachers and civil servants. Future research could, therefore, base on actual sub-populations in order to generate more precise results. In this context also occupation specific life tables could be

¹² We also still lack precision of numerous smaller revenue parts of government finances like contributions for the Labour Fund (in fact unemployment contributions). Additionally, farmers’ social insurance could be more exactly reflected in our computations with additional data on the possible income structure per cohort. This would allow more exact forecasts on e.g. the contribution inflows from richer farmers.

applied. A further improvement concerns the quality and availability of income profiles. For some professions such as teachers and farmers additional information on the income structure per cohort would allow more exact forecasts. In this context also the deviation of the income profiles provided by ZUS from respective data based on the household survey (2006) should be further examined.

In the course of this study we focused on the reformed ZUS pensions system and the ongoing transformation process. Future research could examine some other features of government finances in greater detail. We would e.g. propose to analyze more thoroughly the impact of the profound disability reform of the year 2006. On the basis of 'fresher' micro data – which encompasses more detailed the effects of this reform – we could considerably improve our estimations for this scheme of public finances. Future research could also put a stronger emphasize on the public health care system – which is according to our outcomes a major driver of unsustainability. Since our study diverges from AWG2009 health results we would strongly recommend a closer comparison and exchange with the AWG especially on the data applied but also on the assumptions and methodology. In 2007 only 0.6% *of elderly people (aged 60+) have been cared in nursing homes in Poland. Other EU-countries such as Sweden (7.2%), Netherlands (5%) or Spain (3.4) showed significantly higher levels. Further research could, therefore, also examine the fiscal impact of a possible rise of in-patient care to the EU-average. The core of our study was to analyze the effects of the ageing process on Polish public finances, employment trends have only been partially considered. Future studies could focus more on the future labour market, e.g. on the impact of higher female participation rates on different social security systems.

As outlined above our computations can be clearly further improved and extended in various directions. Against this background, we hope that this initial GA study for Poland will be a valuable fundament for discussion and further research.