GOSPODARKA NARODOWA

2
(270)
Rok LXXXIV/XXV
marzec–kwiecień
2014
s. 25–52

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Medium- and Long-Term Fiscal Sustainability in Europe

Summary: The article focuses on the concept of fiscal sustainability in light of the European Commission's *Fiscal Sustainability Report 2012*. The author discusses the concept of fiscal sustainability and examines sustainability indicators (S1 and S2) in the context of a sovereign debt crisis and population aging.

The author uses an analytical approach as well as descriptive analysis and comparative methods in his research. He comments on the results of fiscal sustainability studies for Poland and Europe as a whole. The analysis of fiscal sustainability in Poland takes into account a recent increase in the statutory retirement age to 67 years for men and women and shows the detailed impact of that decision on the sustainability of public finances in the medium and long term.

In the final part of the article, the author highlights the advantages and disadvantages of the approach used in the report. He concludes that the concept of fiscal sustainability cannot be used directly in day-to-day economic policy due to the high sensitivity of sustainability indicators to parameter changes.

According to Ptak, the European Commission's *Fiscal Sustainability Report* is an important policy document that should be updated regularly.

Keywords: fiscal sustainability, sustainability indicators, primary balance, government debt, population aging

JEL classification codes: H62, H63, H75, E62

Submitted: November 14, 2013. Accepted: February 12, 2014

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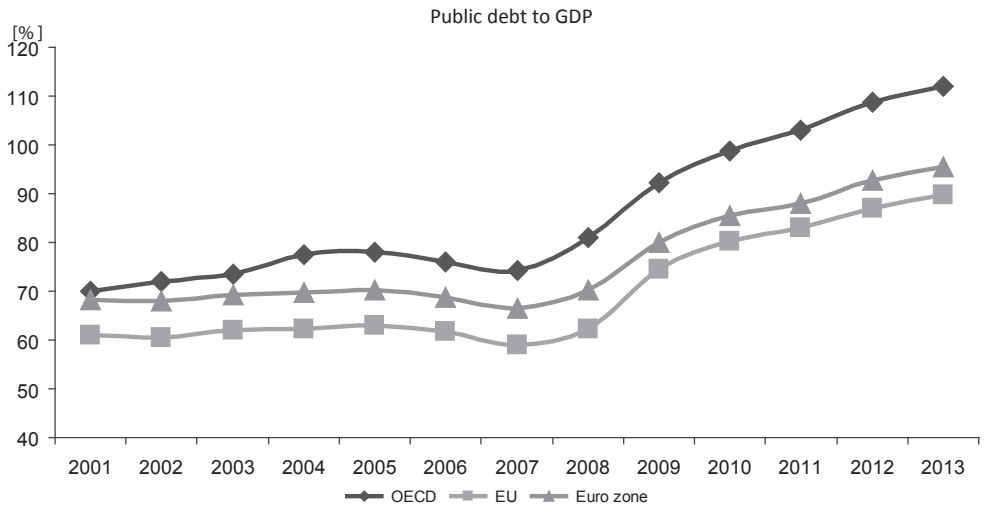
Introduction

The global financial and economic crisis has fully exposed the risks of over-indebted countries stemming from factors including the maintenance of long-term structural deficits.

An unavoidable aftermath of the crisis was a rapid deepening of budget deficits and escalated growth of the debt-to-GDP ratio. According to Eurostat, the European Union's statistics office, the average public debt-to-GDP ratio in the EU increased from 62.2% in 2008 to 86.8% in 2012, whereas in the euro-zone it grew from 70.2% to 92.9%, and in OECD countries it rose from 80.9% to 108.8%. This trend continued in 2013 (see Figure 1).

Figure 1. Public debt in relation to GDP in Europe and OECD countries



Source: AMECO database, European Commission.

Hence, it is not surprising, that the recent growth of public debt and budget deficits has become a significant policy problem in most industrialized countries. The ongoing political debate on the future course of fiscal policy and the need to keep government debt under control, along with medium- and long-term fiscal sustainability, are one of the most widely discussed topics in economics nowadays. Furthermore, the challenges of debt reduction are in line with unfavorable demographic trends due to low fertility rates, steady increases in life expectancy, and the retirement of the baby-boom generation. The aging of the European population will not only have its socioeconomic consequences, but will also constitute a significant burden for government budgets in the future, endangering the medium- and long-term sustainability of public finance.

The main objective of this article is to present the concept of fiscal sustainability in light of the European Commission's *Fiscal Sustainability Report 2012*

[European Commission 2012] along with a critical analysis of the report. Moreover, the analysis of fiscal sustainability for Poland is expanded to include the implications of a recent decision to increase the statutory retirement age to 67 years for men and women. The aim is to show the detailed impact of the decision on the sustainability of public finance in the medium and long term.

The concept of fiscal sustainability

Even though the sustainability of public finance has been discussed for at least a century[1] [Balassone, Franco 2000], it is still an imprecise concept and there is no generally agreed-upon definition of what precisely constitutes a sustainable fiscal policy. It is possible to say that a sustainable fiscal policy is one that will eventually protect a country from bankruptcy [Neck, Sturm 2008, p. 1]. In other words, fiscal sustainability relates to the ability of a government to assume the financial burden of its debt in the future. Therefore, fiscal policy is not sustainable if it leads to an excessive accumulation of government debt over time and ever increasing debt service.

Fiscal sustainability is seen as one of the most important characteristics of an economy that influences the government's ability to conduct effective counter-cyclical fiscal policy, and at the same time the ability of a central bank to conduct an effective and independent monetary policy [Mackiewicz 2010, p. 89]. The problem of fiscal sustainability in the EU becomes crucial in the context of those member countries that also joined the Economic and Monetary Union (EMU). Fiscal sustainability in the EMU is required not only because of the independence of the European Central Bank. Fiscal sustainability also makes it possible to avoid two negative trends: *free riding* and *moral hazard*. The problem of *free riding* occurs when an EMU member violates a mutually established and acceptable level of deficit through an increase in public spending while being aware that any additional costs related to that (an increase in interest rates resulting from an increase in aggregate demand with a constant supply of money) will be covered by all EU members. *Moral hazard* occurs when an EU member state increases its debt over an acceptable limit while being aware that, to stave off insolvency, other members will be forced to offer financial aid because losses associated with bankruptcy (impairment of banking sector assets) would outweigh the cost of the aid (Greece is a case in point). *Moral hazard* can also be manifested in actions undertaken by a country to mandate inflation above a level tolerated by other EMU members (since higher inflation lowers the real value of debt). For example, when one member state is highly indebted, its representative in the European Central Bank may be tempted to tolerate higher inflation in the EU and consequently vote for the maintenance of lower interest rates [Rosati 2013, p. 15].

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1 Some early contributions to the analysis of fiscal sustainability include the works of authors such as D. Hume, A. Smith and D. Ricardo.

The literature has proposed several methods to define and assess fiscal sustainability, differing in both time horizons and the choice of variables. Fiscal sustainability can be regarded as a short-, medium- or long-term concept, with the open question of how to define the horizons, while debt and deficits can be measured gross or net, either including or excluding the liabilities of social security systems and other items. This article deals with the concept of fiscal sustainability introduced in the European Commission's *Fiscal Sustainability Report 2012*.

Prior to discussing the concept of sustainability introduced in that report, it is important to write down the widest definition of fiscal sustainability to understand the main relationships between variables and to look at the solvency[2] condition for the general government through the government's budget constraint. There are two kinds of government budget constraints:

1. current budget constraint – where the time horizon usually equals one budgetary year and public spending is covered by budget revenue and issuance of new debt (or monetization of deficit); it does not prejudge whether public finances are sustainable;

2. inter-temporal budget constraint – it is essential in the analysis of fiscal sustainability and is met when the net present value of all future primary balances is sufficient to pay back the initial debt. This means that the principal debt and interest accumulated along the way will finally have to be paid through sufficiently high primary surpluses.

The government's budget constraint is shown below:

$$G_t + (1 + i_t)D_{t-1} = T_t + D_t \qquad [1]$$

where G_t is primary public spending for goods and services in period t (public spending excluding debt servicing cost); T_t is tax revenues in period t, D_t is public debt issued in period t, and i_t is nominal interest rate in period t; paid in period t on the debt stock outstanding at the end of period $t-1$.

As empirical studies indicate that an economy is subject to a process of long-term growth, it is more convenient for modeling to use the values expressed in relation to GDP [Bohn 2005]. Therefore, assuming that g_t, t_t and d_t are the ratios of government spending for goods and services, tax revenues and public debt issuance to GDP in period t, the equation [1] can be rewritten as

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[2] It needs to be noted that the concepts of sustainability and solvency are often used interchangeably, although a distinction between the two is definitely more reasonable. Sustainability refers to the evolution of the debt ratio based on a no-policy-change scenario. Lack of sustainability means that the debt ratio is on an explosive path, whereas solvency is a more restrictive (and subjective) concept that refers to the inability to conduct fiscal consolidation. An insolvent country has unsustainable public finances (exploding debt dynamics with current policy) and is unable to conduct the necessary adjustment to stabilize these within a specific period of time. Therefore, the risk assessment of solvency means the scale of the fiscal adjustment required to achieve fiscal sustainability.

$$b_t + \frac{1+i_t}{1+y_t} d_{t-1} = d_t \qquad [2]$$

where $b_t = g_t - t_t$ is the primary budget deficit ratio and y_t is the growth rate of nominal GDP.

Equation [2] implies that the debt ratio increases if the government runs a primary deficit and at the same time the nominal interest rate exceeds the nominal GDP growth.

In the long run, however, the government cannot run the Ponzi game[3], i.e. cannot follow a fiscal policy that uses the issuance of ever increasing new debt to repay the outstanding debt and to finance interest payments. Therefore, the present discounted value of government debt, calculated over future periods, must equal zero[4].

$$\lim_{k\to\infty} d_{t+k}(1+i)^{-k} = 0 \qquad [3]$$

In the literature, this condition is referred to as exclusion of the Ponzi game (no-Ponzi game condition – NPG) and it can be interpreted as a requirement that long-term growth of public debt should on average be lower than interest rate (i).

Along with the NPG condition [3], equation [2] gives the government's inter-temporal budget constraint

$$\sum_{t=1}^{\infty}(b_t \prod_{k=1}^{t} \frac{1+y_k}{1+i_k}) + d_0 = 0 \qquad [4]$$

where d_0 is the current debt ratio.

Based on equitation [4], fiscal sustainability is defined as the ability of a government to continue its policy without violating the inter-temporal budget constraint. For sustainable fiscal policy, defined as the absence of default risk, this condition must be met. Equation [4] says that the present discounted value of primary deficits plus the value of current debt must equal zero. This also implies that running up considerable primary deficits over a long time is consistent with fiscal sustainability as long as these deficits can be compensated for by sufficiently high future primary surpluses [Neck, Sturm 2008, p. 6].

The inter-temporal budget constraint can be considered over an infinite and finite horizon. Although, an infinite horizon gives a comprehensive picture of the sustainability of public finances, it might prove to be weak from the standpoint of policy making due to its lack of immediacy and can also raise issues of time consistency. In this regard, the inter-temporal budget constraint does

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3 Named after 1920s U.S. fraudster Charles Ponzi, who borrowed money from new lenders to pay off debt and interest to earlier lenders.

4 An indirect confirmation of the important role of sustainability is the story of Ponzi himself, whose activities were considered fraudulent and who was ultimately sentenced to long imprisonment.

not take into account the development of primary balances over time and does not care for the debt target level within a certain period of time. In this version, the inter-temporal budget constraint can be met by a high level of debt, as long as one assumes a sufficiently high primary surplus in the future.

Alternatively, a finite version of the budget constraint can be defined by setting a target date and a target debt level that allows for an assessment of fiscal sustainability in the medium term. This approach is useful in economic policy and justified by an outcome of several empirical studies but also historical evidence. Both clearly show that a certain level of debt beyond a given threshold has negative consequences for the economy and policy making. The relationship between government debt and economic growth is insignificant for debt ratios below a given threshold, but above it, the average growth rate starts to fall rapidly [Reinhart, Rogoff 2010]. For example, Reinhart and Rogoff [2009] placed the threshold at which public debt is associated with lower contemporaneous growth at about 90% of GDP for both advanced and emerging economies[5]. Other studies with alternative methodologies and samples yield similar estimates [Reinhart, Reinhart, Rogoff 2012, pp. 24–26]. However, it is essential to mention here that the article *Growth in a Time of Debt* [Reinhart, Rogoff 2010] has met with fierce criticism recently. Other economists taking the same data and using the same method of analysis could not come to the same conclusions. Subsequent attempts did not confirm that economic growth starts to decelerate rapidly when the debt-to-GDP ratio exceeds 90%. In the end, three economists, Thomas Herndon, Michael Ash and Robert Pollin from the University of Massachusetts [Herndon, Ash and Pollin 2013], asked for the original database and calculations. An analysis conducted by those economists revealed that the database included gaps and significant volatility in numbers [Herndon, Ash and Pollin 2013]. For example, the real GDP rate for Austria was put at an unlikely level of 27.3% in 1948 and 18.9% in 1949. Furthermore, part of the available data was excluded from the sample, as in the case of New Zealand in the 1946–1949 period, Australia (1946–1950) and Canada (1946–1950). The example of New Zealand is of particular significance. In the abovementioned years, the debt level was greater than 90% of GDP, whereas economic growth was at 7.7%, 11.9%, –9.9% and 10.8% respectively. Therefore, the missing data, with one exception, contradicted the main thesis. In addition, Reinhart and Rogoff applied a non-standard method of weighing samples. All pairs expressing the debt-to-GDP ratios for a country were divided into the following subsets: public debt below 30%, between 30% and 60%, between 60% and 90%, and greater than 90% of GDP. The elements of each subset were averaged afterward and the averages with a different number of elements were taken into final calculation. Finally, Herndon, Ash and Pollin found that, in the excel file, a formula calculating searched values for the first five countries in alphabetical order was not copied. In the conclusion, they stated that errors

5 External debt for emerging markets has a lower threshold of 60%.

made by Reinhart and Rogoff led them to underestimate the rate of growth in the subset of the most indebted countries and that they consequently ended up a false image that high debt is associated with a sharp decline in the growth rate instead of a mild decrease. For countries with a debt-to-GDP ratio higher than 90%, the GDP growth rate in fact equals 2.2% instead of –0.1% on average [Herndon, Ash and Pollin 2013, pp. 15 and 22].

Other economists criticizing the outcome of the article said that, even if no errors are made, the idea of investigating the relationship between public debt and economic growth is not reasonable for such long periods. For instance, Andrea Terzi states that "public debt management as well as the causes and consequences of public debt differ enormously, depending on institutional setups such as exchange rate arrangements, gold parity, limits to central bank operations, banking regulation. Any calculated average over such a broad time span for numerous countries is simply mixing apples and oranges, and is not significant" [Terzi 2013]. Furthermore, many economists pointed out that a negative correlation between debt and economic performance need not mean that high debt causes low growth.

"It could just as easily be the other way around, with poor economic performance leading to high debt. Indeed, that's obviously the case for Japan, which went deep into debt only after its growth collapsed in the early 1990s" [Krugman 2013].

However, based on the recent global crisis and earlier episodes, it is believed that a high level of debt can reduce the room for a country's ability to deal with shocks to interest rates. The shock to the cost of servicing debt in a country with higher public debt will be more significant than for countries with lower public debt. For instance, in countries where government debt exceeds 100% of GDP, a relatively small rise of 10 basis points in the cost of debt servicing increases government outlays by more than 0.1% of GDP annually [European Commission 2009, p. 70]. A high level of debt is also likely to lead to the threshold effects, whereby once the debt reaches a certain level, its further increase will push interest rates even higher. This increase might discourage markets from buying government bonds and lead to the crowding out of private investment. In addition, higher spending on public debt service usually leads to either a worsening in the structure of public spending (cuts in public investment instead of cuts in social services) [Rzońca, Varoudakis 2007] or to higher taxes hampering economic growth.

Overall, soaring public debt increases the vulnerability of an economy to a crisis of confidence on financial markets. An increasing public debt undermines the credibility of the country, leads to its lower rating and ultimately to an increase in the cost of debt servicing along with the risk of falling into a debt trap.

If we consider the government budget constraint in the following way:

$$\Delta d_{t+1} = d_{t+1} - d_t = (r-n)\, d_t + b_{t+1} \qquad [5]$$

where r is the real interest rate and n the real GDP growth rate, then, in order to reduce the public debt ratio, the primary surplus must be larger than the debt servicing cost, which can be reflected as follows:

$$-b_{t+1} >= (r-n)\, d_t \qquad [6]$$

Equation [6] says that the debt ratio will increase indefinitely if the real interest rate exceeds real GDP growth unless the primary budget is in sufficient surplus to compensate for that.

Introduction to fiscal sustainability analysis: *Fiscal Sustainability Report 2012*

Setting a target date and a target debt level enabling an assessment of fiscal sustainability in the medium term is a practical approach to determine an appropriate fiscal policy plan over the medium term. However, such an approach does not necessarily provide an absolute benchmark to assess the degree of sustainability (or un-sustainability) of fiscal policies, particularly in a cross--country sample or for the same country over time if the appropriate target debt ratio varies [Escolano 2010, p. 13].

The European Commission has developed a sustainability indicator (S) as a kind of benchmark to judge the long-term fiscal sustainability of EU countries taking into consideration the implications of aging populations.

Based on the path of primary balances for all future periods ($\{b_t\}_{t=1}^{\infty}$), this indicator is defined as the fixed infinite annual addition (expressed as a ratio to the GDP for a given year) to the primary balances that would ensure the sequence of primary balances sustainable – that is in line with the inter--temporal government budget constraint given by equation [4]. Because one cannot assume that the shape of the initial given sequence of primary balances is optimal or that a fixed annual addition is the best policy approach, the sustainability indicator S should be considered a benchmark and not necessarily a policy recommendation or a measure of the adjustment needed in any particular fiscal year [Escolano 2010, p. 13].

Based on the equation of the inter-temporal budget constraint [4], the sustainability indicator is as follows:

$d_0 = \sum_{t=1}^{\infty} (1+\lambda)^{-t} (b_t + \mathrm{S})$ where, for ease of notation, $\lambda_t = \dfrac{i-y}{1+y}$

and after some modifications

$$\sum_{t=1}^{\infty} (1+\lambda)^{-t} = \lambda^{-1}$$

$\mathrm{S} = \lambda\, d_0 - \lambda \sum_{t=1}^{\infty} (1+\lambda)^{-t} b_t$ and assuming equivalently that $\delta b_t = b_t - b_0$ then:

$$S = \lambda\, d_0 - b_0 - \lambda \sum_{t=1}^{\infty} (1+\lambda)^{-t}\, \delta b_t$$ [Escolano 2010, p. 13].

This sustainability indicator quantifies the fiscal gap that must be closed to ensure the sustainability of public finances. Here is a practical use of this indicator. Assuming that t_1 denotes the current year, the indicator judges fiscal sustainability relative to this current, inherited debt ratio. In order to judge the sustainability of current policies relative to the debt ratio after performing a full fiscal consolidation program, t_0 could denote the last year of the fiscal projection, then e.g. t_3 is the present year. As a result, by the end of projection t_0, the full effects of the fiscal policy on fiscal aggregates will be materialized and will be close to their structural levels. Moreover, for $t_1,...\infty$, the primary balance can be set at $b_t = b_0 + \delta b_t$, where δb_t is defined as the estimated long-term cost of population aging for each year (instead of aging costs, any other long-term costs can be used, e.g. environmental costs).

For instance, the long-term costs beyond projection period t_0 are explicitly estimated for $t_1 \ldots N$ and assumed constant (as a ratio to GDP) afterwards [Escolano 2010, p. 14]

$$S = \lambda\, d_0 - b_0 - \lambda \sum_{t=1}^{N} (1+\lambda)^{-t}\, \delta b_t - (1+\lambda)^{-N}\, \delta b_N$$

where, as mentioned, t_0 denotes the last year of the fiscal projection. This equation is designed to judge the sustainability gap that will exist by the end of the forecasting horizon (at t_0), taking into consideration the current policies given until that horizon and long-term cost forecasts. If no long-term costs are considered ($\delta b_t = 0$), the above formula just determines the distance between the present primary balance at the end of the forecast and the primary balance that would stabilize the level of debt afterwards.

The concept of fiscal sustainability in the *Fiscal Sustainability Report 2012*

The Fiscal Sustainability Report 2012 sheds light on the sustainability of public finances in member states, taking into consideration the impact of the financial, economic and sovereign debt crisis along with the demographic aging process projected in [*The 2012 Ageing Report*...].

The radical worsening of fiscal positions and increases in public debt since 2008 (see Figure 1) in the aftermath of the financial crisis have brought the issue of fiscal sustainability to the fore. The challenges of debt reduction in the EU are compounded by unfavorable demographic trends due to low fertility rates, steady increases in life expectancy and the retirement of the baby-boom generation. For example, a dramatic increase in both total and old-age dependency rates is expected to materialize by 2060. In the EU27, the ratio of inactive population aged 65+ as a percentage of the employed (aged 20–64) is

projected to increase from 40 in 2010 to 74 in 2060. Those changes are only enhanced by increasing life expectancy and falling fertility rates. At the EU27 level, life expectancy at birth for women is projected to increase from 82.5 years in 2010 to 89.1 years by 2060, while for men it is set to increase from 76.7 to 84.6 years. On the other hand, the fertility rate (births per woman) is projected to inch up from 1.6 to 1.7, a level far below the natural replacement rate of 2.1 (births per woman) [*The 2012 Ageing Report*...].

The aging of the population has both a direct (increase in age-related expenditures) and indirect (decline in potential GDP as a result of a reduction in labor supply) impact on public finances. An aging population increases government expenditures in the provision of age-related transfers and services. The European Commission's projections[6] cover four age-related items: expenditures on public pensions (depending on the number of pensioners and average life expectancy on retirement), healthcare expenditures (depending on the way the health sector is organized and the split of costs between the government, patients and private institutions), long-term care expenditures (depending on the "quality" of aging and support from the government), and education expenditures (these fall along with the aging of society – a decreasing share of young people in the total population).

Overall, population aging is expected to have a significant impact on economic growth and lead to significant pressures on public spending. Needless to say, it will be challenging for member states to maintain sound and sustainable public finances in the medium and long term. Apart from the necessity of carrying out a traditional fiscal consolidation, this will require a credible entitlement reform strategy (pensions, healthcare, long-term care) to address the expected growth in age-related spending.

The 2012 Fiscal Sustainability Report aims to provide a comprehensive analysis of the sustainability of public finances across the EU. For this purpose, the following three sustainability indicators were used in the report:

– S0 indicator (referred to as "early detection of fiscal stress") assessing short-term fiscal challenges;
– S1 indicator (referred to as "debt compliance risk") assessing medium-term fiscal challenges;
– S2 indicator (referred to as "aging-induced fiscal risks") assessing long-term fiscal challenges.

The S1 and S2 indicators are traditional[7] fiscal sustainability indicators based on forecasts for growth and fiscal balances, extrapolated by incorporating the long-term projections of *The 2012 Ageing Report*, in particular the projected trend in age-related expenditure. The S0 indicator is a newly developed indicator based on current data, aggregating fiscal and macro-financial variables. It does not quantify the required fiscal adjustment, unlike in the case

6 See the methodology in [*The 2012 Ageing Report*].

7 *The Sustainability Report 2009* used only the S1 and S2 indicators to assess the sustainability of public finances in the EU; see [European Commission 2009].

of the S1 and S2 indicators, but estimates the extent to which there might be a risk of fiscal stress in the short term (in one-year time horizon)[8].

This article deals with the S1 and S2 indicators in assessing the sustainability of public finances in EU countries in the medium and long term.

Medium and long-term sustainability indicators: S1 and S2

The S1 medium-term sustainability indicator presents the upfront budgetary adjustment effort required, in terms of a steady improvement in the structural primary balance, to be introduced from 2014 until 2020, and then sustained for a decade, to bring the debt ratio back to 60% of GDP by 2030, including financing any additional expenditures, stemming from population aging until the end-point date[9]. The choice of the debt ratio end-point for the S1 indicator is in line with the debt threshold in the European Treaty. In the calculations, the threshold is assumed to converge to 60% of GDP in 2030.

The report states [European Commission 2012, p. 4]: "The timescale has been chosen to be long enough to allow the impact of ageing to be analyzed in a meaningful way, while still remaining within the sights of current taxpayers and policy makers."

The S1 indicator judges the extent of the medium-term sustainability challenge by using the following thresholds: (i) if the S1 is below zero, the country is assigned low risk; (ii) if the S1 is between 0 and 3 (thus requiring a structural adjustment in the primary balance of up to 0.5 p.p. of GDP per year until 2020), the country is assigned medium risk; and, (iii) if the S1 is greater than 3 (calling for a structural adjustment of more than 0.5 p.p. of GDP per year), the country is assigned high risk.

Unlike with the S1 indicator, no specific end-point value for debt is included in the S2 indicator as this indicator is calculated over an infinite horizon showing a budgetary adjustment to the current structural primary balance required to fulfill the infinite inter-temporal budget constraint, including paying for any additional expenditure arising from population aging. The adjustment implied by the S2 indicator might lead to debt stabilizing at relatively high levels. Therefore, this indicator has to be taken with some caution for high-debt countries to reduce their debt below 60% of GDP in accordance with the rules of the Stability and Growth Pact [European Commission 2012, p. 19][10].

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8 The methodology and description of the S0 indicator can be found in the report on pages 22–25 and 35–38.

9 In the 2009 Sustainability Report, the S1 indicator was calculated with reference to the debt target of 60% of GDP in 2060.

10 However, historical evidence shows that, over the past three decades, there have been 14 episodes in advanced economies and 26 in emerging economies when individual countries managed to adjust their structural primary balance by more than 7 percentage points of GDP; see [IMF 2010].

The S2 indicator judges the extent of the long-term sustainability challenge by using the following thresholds: (i) if the value of the S2 indicator is lower than 2, the country is assigned low risk; (ii) if the S2 is between 2 and 6, the country is assigned medium risk; and, (iii) if the S2 is greater than 6, the country is assigned high risk.

The S1 and S2 indicators quantify the gap that must be closed to maintain and/or restore fiscal sustainability. The higher the sustainability indicator, the greater the fiscal sustainability risk and the greater the fiscal adjustment that is required. A negative value of S1 and S2 means that both versions of the inter-temporal budget constraint – finite and infinite – are satisfied. The indicators do not suggest how the required fiscal consolidation should be carried out: by raising taxes, reducing spending or making the necessary changes to reduce spending related to population aging. However, the choice of the way but also of the pace DeLong and Summers 2012] at which the fiscal consolidation should be carried out, does matter. For example, raising taxes will lead to a worsening of the growth outlook and will consequently have a negative impact on fiscal sustainability.

On the other hand, the decomposition of both indicators allows for an isolation of factors that influence sustainability or un-sustainability (see Table 1).

The first component, common for both indicators, is the initial budgetary position (IBP). It shows the gap between the current or initial structural balance and the debt-stabilizing balance to ensure fiscal sustainability.[11] In the case of the S1 indicator, it is important to note that the gradual improvement in the primary balance implies a higher required adjustment compared to one that would be required immediately. This required additional adjustment (called "the cost of delay") constitutes a part of the IBP component only in the case of the S1 indicator.

The second component relevant only for the S1 indicator is the debt reduction requirement (DR). However, the starting level of the debt enters the definition of both indicators through the initial budgetary position because it influences the cost of debt servicing that must be covered. In the case of the S1 indicator, the size of the required adjustment also depends directly on the debt requirement set at the end of the time period (60% of GDP in 2030). For countries with a starting public debt above 60% of GDP, the S1 indicator will be higher due to the additional effort related to the required debt reduction by 2030. For countries with a current debt below 60% of GDP, the DR component will be negative regardless of competing pressures on the budget from long-term trends, and as a result this component will reduce the overall value of the fiscal gap.

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11 The long-term debt-stabilizing primary balance refers to the primary balance that, if reached, would stabilize the debt in the long run at its current level. It therefore depends on the long--term prospects of GDP growth and interest rates. It can differ from the short-term debt--stabilizing primary balance that can be calculated with the current nominal GDP growth and nominal interest rates.

The third common component that occurs in both indicators is the cost of aging (CoA). This component constitutes an additional adjustment to the primary balance required due to the future expenditures in both the finite (2030) and infinite horizons. The CoA component illustrates either the change in the primary balance required to finance the additional expenditures or the size of the required structural reform with regard to the Social Security and Healthcare System to avoid an increase in age-related spending[12].

In addition, in both sustainability indicators, property income[13] is estimated and included as government revenue lowering the fiscal deficit. Therefore, if the primary balance changes due to a change in the property income, this will be reflected in the required adjustment in the initial budgetary position (IBP) component. Table 1 shows the components of both the S1 and S2 indicators.

Table 1. The components of the S1 and S2 sustainability indicators

	Required adjustment given to initial budgetary position (IPB)		Required adjustment to reach debt to GDP ratio of 60% in 2030 (DR)		Required adjustment due to the cost of ageing (CoA)
S1	Gap to debt-stabilizing primary balance in 2020 through a steady gradual adjustment	+	Additional adjustment required to reach a debt target of 60% of GDP in 2030	+	Additional adjustment required to finance the increase in public expenditure due to ageing population up to 2030.
S2	Gap to debt-stabilizing primary balance	+	**0**	+	Additional adjustment required to finance the increase in public expenditure due to ageing population over an infinite horizon

Source: *The Fiscal Sustainability Report* [European Commission 2012, p. 19].

The fiscal gap quantified by both indicators makes it possible to indicate not only the source of un-sustainability (initial budgetary position IPB, debt requirement DR in the case of the S1 indicator or the projected increase in age-related

12 The future increases in age-related expenditure due to demographic trends are included in the initial level of other public spending as a share of GDP (and kept constant in further projections). For the years beyond 2060 – the horizon of the available demographic projections – further assumptions are also necessary in relation to the infinite-horizon S2 indicator. Beyond 2060, it is assumed in the report that both revenue and expenditures, including age-related expenditures, are constant as a share of GDP, whereas interest payments go in line with debt developments. Such an assumption means that if the European population continues to age, the value of the S2 indicator will be underestimated.

13 The report assumes no accumulation of financial assets and hence no stock-flow adjustment. This means that the nominal value of government-owned financial assets is constant leading to a decrease in the share of these assets as a percentage of GDP.

expenditures CoA), but also the urgency as in the case of demographic-related issues (e.g. pensions vs. healthcare expenditures).

Moreover, understanding the sources of fiscal un-sustainability has its implications from the standpoint of political economy. For instance, fiscal consolidation – based on either tax increases or spending cuts – should be easier from the political point of view when the sustainability gap stems mainly from the initial budgetary position (IBP) rather than population aging. In the latter case, the increase in expenditures stretches over time and often affects a distant time horizon. Therefore, structural reforms in social protection systems may be far more difficult under certain circumstances.

Derivation of the S1 and S2 sustainability indicators

The description presented in the report [European Commission 2012, p. 135] is as follows:

t – year's index,

c – the annual increase in the primary structural balance between t_{0+1} and t_1

t_0 – year preceding the start of the projection,

t_{0+1} – start of fiscal adjustment,

t_1 – end of fiscal adjustment (relevant for S1),

t_2 – target year for the debt (relevant for S1; 2030),

D_{t_0} – debt-to-GDP ratio at t_0 year,

PB_t – ratio of structural primary balance-to-GDP,

$\Delta PB_t = PB_t - PB_0$, change in the structural primary balance relative to the base year (i.e. t_0)

$\Delta A_t = A_t - A_0$ – change in age-related costs relative to the base year (i.e. t_0)

$S1$[14] $= c\ (t_1 - t_0)$ defines the S1 indicator as the total adjustment.

r – differential between the nominal interest rate and the nominal GDP growth rate i.e.

$$1 + r = \frac{1+R}{1+G}$$

where R and G are the nominal interest rate and the nominal growth rate respectively.

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14 The S1 indicator shows the upfront adjustment effort required, in terms of a steady improvement in the structural primary balance, to be introduced until t_1, to bring the debt ratio back to a given level in t_2, including financing for any additional expenditure until the target date, arising from an aging population.

In case the interest rate/growth rate differential is time varying, the report considers:

$\alpha_{s;v} = (1 + r_{s+1})\,(1 + r_{s+2})\,\ldots\,(1 + r_v)$ as the accumulation factor that transforms 1 unit in period s to period v.

The S1 sustainability indicator is given below (a detailed description of how the indicator is derived can be found on pages 135–136 of the report):

$$\underset{\mathbf{T}}{S1 = c\,(t_1 - t_0)} = \underbrace{\frac{D_{t_0}\,(\alpha_{t_0;t_2} - 1)}{\sum^{t_2}_{i=t_0+1}(\alpha_{i;t_2})}}_{\mathbf{A}} - PB_{t_0} + \underbrace{c\,\frac{\sum^{t_1}_{i=t_0+1}\left((t_1 - i)\alpha_{i;t_2}\right)}{\sum^{t_2}_{i=t_0+1}(\alpha_{i;t_2})}}_{\mathbf{B}} + \underbrace{\frac{D_{t_0} - D_{t_2}}{\sum^{t_2}_{i=t_0+1}(\alpha_{i;t_2})}}_{\mathbf{C}}$$

$$+ \underbrace{\frac{\sum^{t_2}_{i=t_0+1}(\Delta A_i \alpha_{i;t_2})}{\sum^{t_2}_{i=t_0+1}(\alpha_{i;t_2})}}_{\mathbf{D}}$$

where (T) is the total adjustment (the S1 indicator by definition); (A) the strict initial budgetary position (i.e. the gap to the debt-stabilizing primary balance); (B) the cost of delaying the adjustment; (C) the required additional adjustment due to the debt target (DR); and (D) the additional required adjustment due to the costs of aging (CoA). The total initial budgetary position (IBP) is the sum of A and B, i.e. includes the cost of delaying the adjustment.

The S2 sustainability indicator is given below (a detailed description of how the indicator is derived can be found on pages 136–137 of the report):

$$S2 = \underbrace{\frac{D_{t_0}}{\sum^{\infty}_{i=t_0+1}\left(\frac{1}{\alpha_{t_0;i}}\right)}}_{\mathbf{A}} - PB_{t_0} + \underbrace{\frac{\sum^{\infty}_{i=t_0+1}\left(\frac{\Delta A_i}{\alpha_{t_0;i}}\right)}{\sum^{\infty}_{i=t_0+1}\left(\frac{1}{\alpha_{t_0;i}}\right)}}_{\mathbf{B}}$$

where (A) is the initial budgetary position i.e. the gap to the debt-stabilizing primary balance; and (B) the additional required adjustment due to the costs of aging.

The fiscal sustainability analysis conducted in the report is based on the Commission Services' autumn 2012 forecast (up to 2014), and the macroeconomic scenario used in *The 2012 Ageing Report*. In addition, the following detailed assumptions are made in *The Fiscal Sustainability Report* [European Commission 2012, p. 21]:

Results of the sustainability analysis

S1 indicator

The S1 sustainability indicator assesses the medium-term fiscal challenges. In this case, the calculation shows the required fiscal adjustment over the 2014–2020 period to reach the debt-to-GDP threshold of 60% in 2030. In this calculation, the structural primary balance is assumed to be linearly improved from 2014 through 2020. It mainly deteriorates due to the cost of population aging (unless this is negative), but the level of the structural primary balance is still sufficient to reach the 60% threshold by 2030. The components of the ($S1^{60\%}_{2030}$) indicator provide the following information:

– the gap (IBP) between the structural primary balance in 2014 and the debt-stabilizing structural primary balance together with the additional adjustment due to the cost of delay,
– the fiscal adjustment necessary to reach the debt-to-GDP threshold of 60% in 2030 (DR),
– required adjustment due to the change in the structural primary balance in terms of the costs of aging (CoA).

The report reveals that the sustainability gap measured by the S1 indicator is 1.8% of GDP for the EU27 and 1.7% for the eurozone. The required fiscal adjustment varies significantly between countries not only in size but also in terms of S1 indicator components (initial budgetary position and debt level, GDP growth outlook and lower cost of aging because of the relatively short time horizon). For instance, in countries such as the U.K., Spain and Belgium the sustainability gap is more than 5% of GDP, which means that the additional adjustment to the primary balance necessary to bring the debt-to-GDP ratio to 60% will be extremely difficult, especially from the political point of view [Cottarelli and Jaramillo 2012].

The data presented in the report includes the same sustainability analysis but with different initial structural primary balances. Apart from 2014, assumed as the base year in the report, the average primary balances over the pre-crisis period of 2000–2008 and for 2011 were also presented to show how difficult it can be to maintain the current or required high levels of primary balances to ensure fiscal sustainability. Even though the levels of the structural primary balance in 2014 exceed the previous average primary balances over the pre-crisis period (2000–2008) in most countries, the difference between them is not a non-achievable target (1.2 for the EU and 1.7 for the eurozone in 2014, versus 0.8 for the EU and 0.5 for the eurozone in 2000–2008). However, historical evidence and empirical studies show that, in the aftermath of a financial crisis, not only a high level of debt, but also "fiscal fatigue" may hinder efforts to grow out of debt. Such a situation means that, despite maintaining a high primary surplus, sooner or later this surplus will start to decline when the debt level achieves a certain high value [Ghosh et al. 2011]. This is due

to the fact that continued growth in spending on public debt service leads to either tax increases or cuts in primary public spending. Higher taxes hamper economic growth, and ongoing cuts in public spending may collide with the necessary political costs to be incurred. Overall, the S1 medium-term sustainability gap runs at 1.8% of GDP for the EU and at 1.7% of GDP for the eurozone on average (see Table 2 below).

Table 2. Quantitative results of the S1 medium-term sustainability indicator

Country	Gross debt 2014	Average primary balance (2000–2008)	Structural primary balance		S1	Required adjustment due to			
						Initial budgetary position		Debt requirement	Aging cost
			2011	2014		Debt stabilizing primary balance	Cost of delay		
BE	101.0	4.0	–0.1	0.3	6.2	0.6	1.0	2.4	2.1
BG	18.3	2.0	–0.7	0.3	–1.5	0.2	–0.3	–2.3	0.8
CZ	48.1	–3.1	–1.8	–0.9	1.3	1.1	0.2	–0.7	0.7
DK	45.3	4.3	2.2	0.5	–2.0	–1.0	–0.3	–0.9	0.2
DE	78.4	0.8	1.8	2.5	–0.3	–2.1	–0.1	1.1	0.7
EE	11.2	–0.8	–0.6	0.4	–3.4	0.1	–0.5	–3.0	0.2
ES	97.1	1.5	–5.0	–1.3	5.3	2.4	0.9	2.2	–0.3
FR	93.8	–1.0	–1.8	0.5	1.9	–0.7	0.3	2.1	0.1
IT	126.5	1.7	1.2	5.0	0.6	–3.0	0.1	3.7	–0.3
CY	102.7	0.8	–3.5	–1.1	8.2	2.9	1.4	2.4	1.3
LV	44.9	–2.0	–0.2	0.4	–2.0	0.0	–0.3	–0.9	–0.8
LT	40.5	–1.5	–3.1	–0.1	0.3	0.7	0.1	–1.1	0.7
LU	26.9	1.5	0.6	–0.4	0.3	0.2	0.0	–2.0	2.0
HU	76.8	–2.7	–0.2	1.6	–0.4	–0.1	–0.1	0.9	–1.3
MT	72.7	–1.6	–0.4	0.4	2.0	0.3	0.3	0.7	0.5
NL	70.3	1.9	–1.4	0.2	2.2	0.2	0.3	0.6	1.0
AT	75.1	1.3	0.3	0.8	2.6	–0.3	0.4	0.9	1.6
PL	56.1	–1.7	–2.4	1.0	0.1	–0.3	0.0	–0.2	0.6
RO	34.8	–1.4	–2.3	0.7	–1.4	–0.2	–0.2	–1.4	0.4
SI	62.3	–1.4	–2.8	0.1	3.2	0.9	0.5	0.1	1.4
SK	55.9	–2.3	–3.8	–0.8	2.2	0.8	0.3	–0.2	1.3
FI	55.0	5.2	1.4	0.9	2.0	–0.6	0.3	–0.3	2.5
SE	34.1	3.0	1.4	1.7	–3.6	–2.0	–0.6	–1.6	0.6
UK	95.1	–0.7	–3.5	–1.5	5.0	1.7	0.8	2.1	0.2
EU	88.8	0.8	–0.9	1.2	1.8	–0.7	0.3	1.7	0.4
EA	94.5	0.5	–0.4	1.7	1.7	–1.2	0.3	2.0	0.4

Source: *Fiscal Sustainability Report 2012* [European Commission 2012, p. 40].

S2 indicator

The S2 sustainability indicator assesses long-term fiscal challenges. In this case, the calculation shows the required fiscal adjustment over the infinite horizon to reach the inter-temporal budget constraint and its decomposition into: the initial budgetary position (IBP) and the cost of aging (CoA).

The S2 long-term sustainability gap is on average at 2.6% of GDP for the EU and at 2.1% of GDP for the eurozone, however the differences between member states are sometimes significant (e.g. there are countries with sustainable public finances, such as Italy (–2.3) and Latvia (–0.7), and those where the sustainability gap exceeds 6% of GDP, such as Belgium, Cyprus, Luxembourg, and Slovakia; see Table 3).

Table 3. Results of the S2 indicator

Country	BE	BG	CZ	DK	DE	EE	ES	FR	IT	CY	LV	LT	LU
S2	7,4	2,8	5,5	2,6	1,4	1,2	4,8	1,6	–2,3	8,2	–0,7	4,7	9,7
IBP	1,0	0,5	1,7	0,9	–1,0	0,5	2,9	0,6	–3,0	2,8	0,7	0,9	1,2
CoA	6,4	2,3	3,8	1,7	2,4	0,7	1,9	0,9	0,7	5,4	–1,5	3,8	8,5

Country	HU	MT	NL	AT	PL	RO	SI	SK	FI	SE	UK	EU	EA
S2	0,5	5,8	5,9	4,1	1,5	3,7	7,6	6,9	5,8	1,7	5,2	2,6	2,1
IBP	0,1	1,0	2,0	0,5	0,4	0,1	1,1	1,8	0,9	–1,0	2,6	0,5	0,0
CoA	0,3	4,9	4,0	3,6	1,1	3,6	6,6	5,1	4,9	2,7	2,6	2,2	2,1

Source: [European Commission 2012, p. 40].

Table 4. Results of the S1 and S2 indicators and risk assigned to them

Country	BE	BG	CZ	DK	DE	EE	ES	FR	IT	CY	LV	LT	LU
S1	H	L	M	L	L	L	H	M	M	H	L	M	M
S2	H	M	M	M	L	L	M	L	L	H	L	M	H

Country	HU	MT	NL	AT	PL	RO	SI	SK	FI	SE	UK
S1	L	M	M	M	M	L	H	M	M	L	H
S2	L	M	M	M	L	M	H	H	M	L	M

Where: L stands for low sustainability risk; M for medium, and H for high sustainability risk. Source: Own summary based on the *Fiscal Sustainability Report 2012* [European Commission 2012].

The decomposition of the S2 indicator highlights the significant costs of population aging. Countries such as Germany, Italy and Sweden have sustainable public finances, based on their initial budgetary position (IBP), yet their fiscal sustainability is insufficient to address the cost of aging. Such countries require a credible entitlement reform strategy (pensions, healthcare, long-term

care) to address the expected growth in age-related spending. Table 4 shows the overall results of the S1 and S2 indicators in terms of the risk assigned to them.

Fiscal sustainability in Poland compared with Europe as a whole

The results of the sustainability analysis conducted in the report reveal that Poland is at medium sustainability risk in the medium term (S1 indicator at 0.1%) and at low risk in the long term (S2 indicator at 1.5% of GDP).

The sustainability gap in terms of the S1 indicator is far below the EU average, which means that an adjustment is needed to attain the reference debt-to-GDP ratio of 60% by 2030. Poland is expected to close the long-term fiscal sustainability gap of 1.5% of GDP in terms of the S2 indicator, which is also below the EU average (2.6% of GDP). This mainly reflects the highly favorable long-term aging-cost component[15].

However, these results are based on the assumption that fiscal consolidation will be fully implemented and that the primary balance will be maintained well beyond 2014 at the target level expected to be reached in 2014 (a primary balance surplus of 1% of GDP). The report notes that if this level is not met or if there is a return to the low primary balance values observed in the past (the average primary balance in the 1998–2012 period showed a deficit of –1.7% of GDP), the risk to fiscal sustainability in both the medium and long term will be much higher [European Commission 2012, p. 121].

It is important to note that the sustainability analysis conducted in the report does not cover the latest reform based on an increase in the retirement age for both men and women[16]. As part of the reform, the statutory retirement age for men and women in Poland was increased and equalized at 67

15 *The 2012 Ageing Report* projects a slight increase in total age-related public expenditure in Poland from 2010 to 2060 (0.1 pp. of GDP, against an EU average of 2.9 pp. of GDP). Over this period healthcare and long-term care spending is projected to increase by 2.9 pp. (against an EU average of 2.0 pp.), while public pension expenditure is projected to decrease (–2.2 pp., against an increase of 1.4 pp. in the EU and 1.8 pp. in the eurozone). The sharp decrease of pension expenditure is the result of a pension reform carried out in 1999 – based on a move from the defined benefit (DB) system to the notional defined contribution (NDC) model. On the other hand, the report stresses that such a sharp decrease in pension expenditure means that the replacement ratio (relation of pension to the last salary) in Poland will be among the lowest in Europe (at less than 20%). The average pension in Poland in 2060 is expected to be only slightly higher than that guaranteed by the state, which means that a large number of pensions will be subsidized directly from the budget, necessitating either a drastic increase in taxes, or a reduction in spending on development – in line with the expectations of many older voters. Those aged 65+ will constitute almost 35% of the total population in 2060.

16 The 2012 AWG Report includes only approved amendments at the time the report was issued.

years, from 60 years for women and 65 years for men[17]. This change naturally entails consequences for fiscal sustainability. Below I show the channels through which fiscal sustainability is affected and how that translates into the S1 and S2 indicators.

First of all, the effect of increasing the retirement age leads to an increased number of employees in the economy[18].

As a result, the GDP path changes and has a generally positive impact on fiscal sustainability[19] (due to a positive impact on the general government sector through stabilization in the pension system, economic growth, and increased demand for labor, accompanied by a fall in unemployment; see Table 5 and Figure 1).

At the same time, the increase in the statutory retirement age influences total pension expenditures that have an impact on public finances. The gradual increase in the retirement age means that the number of pensioners and the total amount of old-age pensions will be lower. Changes in pension expenditures until around 2040 will be positive for public finances (with an improvement in the cost-of-aging component of both the S1 and S2 indicators). However, afterwards pension expenditures will begin to grow faster than prior to the reform and the benefits of the reform will start to decline (see Figure 3).

Table 5. Average GDP growth forecasts before and after the increase of the retirement age (%)

Year	Before	After
2010–2020	3.51	3.58
2021–2030	2.7	2.87
2031–2040	2.19	2.43
2041–2050	1.46	1.6
2051–2060	1.33	1.21
2010–2060	2.26	2.36

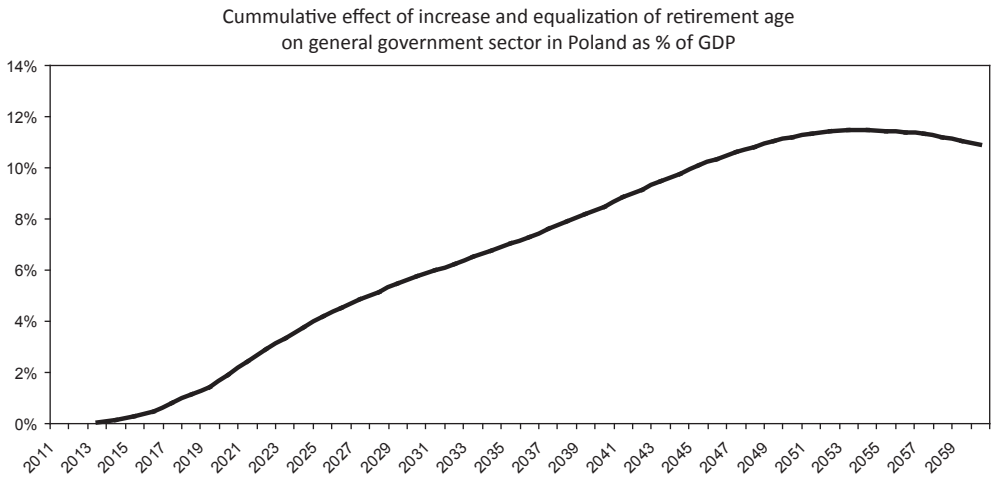
Source: Justification to the Bill amending the act on pensions and disability pensions paid from the Social Insurance Fund and on some other acts. Parliamentary paper No. 329, p. 29.

17 The statutory retirement age was raised beginning Jan. 1, 2013 by one month every four months so that a target level of 67 years is achieved for both men and women – in 2020 and 2040 respectively.

18 Raising the retirement age is expected to limit the reduction (connected with the aging of the population) in the working-age population in 2040 by about 2.4 million and at the same time limit the decline in the economically active population by about 1.1 million. See: The Prime Minister's Office: http://emerytura.gov.pl/upload/emerytury-prezentacja-2012-02-23.pdf

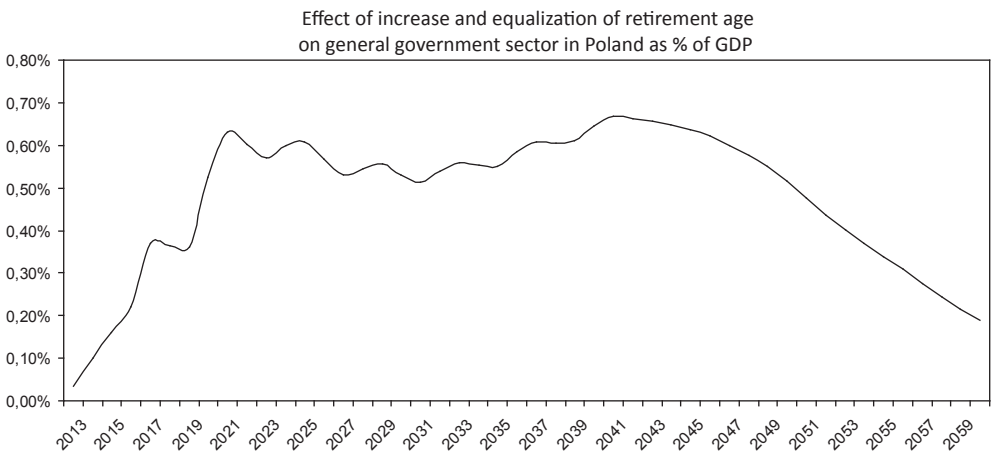
19 The simulations show that raising the retirement age will increase average GDP growth in 2010-2060 by 0.1 pp. As a result, with the reform, Poland's 2060 GDP will be 5.1% higher than in the no- policy-change scenario. See: Justification to the Bill amending the act on pensions and disability pensions paid from the Social Insurance Fund and on some other acts. Parliamentary paper No. 329 pp. 29–30.

Figure 2. The cumulative effect of the increase in the retirement age on the general government sector in Poland



Source: Based on the Bill amending the act on pensions and disability pensions paid from the Social Insurance Fund and on some other acts. Parliamentary paper No. 329, pp. 56–57.

Figure 3. The effect of the increase and equalization of the retirement age on the general government sector in Poland as % of GDP



Source: Based on Justification to the Bill amending the act on pensions and disability pensions paid from the Social Insurance Fund and on some other acts. Parliamentary paper No. 329, pp. 56–57.

This is due to accumulated liabilities in the general pension system. The increase of the retirement age simply means the postponement of translation of the liabilities into pensions. The accumulation of liabilities on pension accounts should contribute to an increase in pension expenditure at the end of the projection and, as a result, the long-term aging component in the

S2 indicator will deteriorate (in the case of the S1 indicator, as mentioned above, there is an improvement due to the finite time horizon).

In terms of fiscal sustainability, the positive impact of the increase in the statutory retirement age is due to changes in government revenue from taxation leading to an improvement in the primary balance. First of all, due to the reform, the limited reduction in the working-age population and economically active population will improve the primary balance through higher tax revenues compared to the no-policy-change scenario. Moreover, the reform primarily aims to increase the adequacy of future pension benefits[20]. Higher pension benefits will translate into higher tax revenues leading to an improvement in the primary balance. This will be reflected in both sustainability indicators, chiefly in the S2 indicator due to the given infinite time horizon. Table 6 below shows the impact of the reform on the S1 and S2 sustainability indicators broken down into constituents.

Table 6. The impact of the increase in the statutory retirement age in Poland on the S1 and S2 sustainability indicators and their individual components

	S1 (finite time horizon – 2030)			S2 (infinite time horizon)	
Components of S1 and S2 indicators	IBP	DR	CoA	IBP	CoA
Effect of increase in statutory retirement age	P	N	P	P	N

Where: P stands for a "positive" effect and N for a "neutral" one.

Source: Own calculation.

Due to the increase of the retirement age in Poland, the initial budgetary position (IBP) in both indicators improves. However, the improvement is limited in view of the one-year time horizon (launch of the reform in 2013[21] versus the base year assumed in the analysis for 2014). The impact on the debt requirement (DR) in the S1 sustainability indicator is neutral because the forecast debt-to-GDP ratio for Poland in 2014 is 56.1%, so this component is negative and no additional fiscal effort is required (it automatically lowers the S1 indicator). As mentioned earlier, the reform has a positive impact on the cost-of-aging component in relation to the S1 sustainability indicator. This is due to a smaller (compared with the no-policy-change scenario) number of beneficiaries and a higher number of those insured and paying pension contributions. However, in view of the benefit model existing in Poland, people retiring later in life will receive higher pension benefits. For this reason, pension fund

20 After raising the retirement age, women's pensions will increase by about 70% and men's pensions will grow by about 20%. See: The Prime Minister's Office: http://emerytura.gov.pl/upload/emerytury-prezentacja-2012-02-23.pdf

21 It is estimated at 0.04% of GDP.

expenditures will gradually increase and as a result the temporary improvement in the pension fund balance will expire[22]. Thus, the overall effect of the reform will be neutral for the cost-of-aging component in the S2 indicator[23].

Summary

The main advantages and disadvantages of the sustainability indicators used in the *Fiscal Sustainability Report 2012* include:

– advantage: the indicators take into account the future impact of ongoing (and past) fiscal policies,
– disadvantage: they are highly sensitive to changes in the current structural primary balance[24] and to changes in long-term macroeconomic and demographic assumptions.

Considering the advantages and disadvantages of the two approaches (finite vs. infinite time horizon), it is possible to conclude that:

– the finite horizon is more readable and understandable to both the public and decision makers, but it may fail to take into account the effects of aging or long-term growth policy. It also requires an appropriate date and a target debt level.
– the infinite horizon is more abstract, but it includes the effects of some reforms that could appear after a certain time.

The sustainability analysis introduced in the report is more than just a theoretical concept. It is regularly used to assess fiscal sustainability by the European Commission and the International Monetary Fund, for example in Reports on Public Finances in the EMU (the IMF uses this kind of analysis

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22 Fifty years after the launch of the reform, the annual pension fund balance will be close to the level projected in the no-policy-change scenario. See: the Bill amending the act on pensions and disability pensions paid from the Social Insurance Fund and on some other acts. Parliamentary paper No. 329.

23 A similar effect takes place with regard to other aspects of the CoA component: healthcare and long-term care expenditures. The reform will have a neutral effect because the annual financial plan of the National Health Fund is expected to be balanced in terms of revenues and expenditures. This means that the increased revenues from insurance premiums will be used by the National Health Fund to finance health services and drugs.

24 For instance, in line with the 2013 Report on Public Finances in the EMU, which includes the European Commission's Spring 2013 forecast – instead of the Autumn 2012 forecast used in the *Fiscal Sustainability Report 2012* – the results for the S1 and S2 sustainability indicators differ considerably. Due to a rapid worsening in the structural primary balance from the assumed surplus of 1% of GDP to a deficit of 0.4% in 2014 (following a slowdown in the European economy), the initial budgetary position (IBP) in Poland deteriorates significantly and drives up the sustainability gap for both the S1 and S2 indicators from 0.1% and 1.5% of GDP to 1.1% and 2.8% of GDP respectively. This clearly shows that the greater the change in the initial budgetary position (base year in the analysis) the greater the impact on the overall sustainability gap of both indicators. This high sensitivity of sustainability indicators to parameter changes means that they are not suitable for direct use in day-to-day economic policy. See the *Report on Public Finances in the EMU 2013* [European Commission 2013, p. 42].

in reference to external sustainability). Moreover, the concept is used to calculate the medium-term objectives (MTO) that member states are expected to achieve. Sustainability indicators can be useful in determining the direction of fiscal policy (useful for determining the appropriate objectives for fiscal rules; e.g. for a structural balance, a balance over the cycle, the level of debt etc.). They can also help assess the scale of the necessary fiscal consolidation (in a transition period) and thus make decision makers increase their interest in these indicators in "bad times" when traditional indicators show a large scale of fiscal adjustment.

Fiscal sustainability indicators can be regarded as an important complement to traditional measures of public finances and as a signal for policy makers that fiscal policy is not sustainable in the long term; hence they could help encourage governments to carry out structural reforms.

The concept introduced in the report cannot be used directly in day-to-day economic policy because the sustainability indicators are highly sensitive to parameter changes. However, the *Fiscal Sustainability Report* should be an important government document, updated regularly, though requiring a large dose of objectivity.

Conclusion

The recent growth of public debt and budget deficits has become a significant policy problem in most industrialized countries. This is not surprising because markets and the public place great importance on a reasonably low and stable ratio of government debt to GDP. They tend to interpret a high and growing debt ratio as a sign of endangering fiscal sustainability or even looming public insolvency. Keeping the debt ratio below an upper bound to reassure economic agents is well founded, as an ever increasing debt ratio would eventually result in a fiscal debt crisis and default – either outright or through inflation or other means.

In Europe, fiscal sustainability is becoming a pressing challenge amid deteriorating fiscal positions and rapid increases in government debt since 2008, accompanied by population aging and unsettling demographic forecasts. In the period up to 2060, the EU population is projected to age significantly. This is mainly due to low fertility rates, steady increases in life expectancy, and the retirement of the baby-boom generation. Needless to say that, apart from social and political consequences, the aging of the European population will constitute a significant burden for government budgets in the future, endangering the medium- and long-term sustainability of public finance.

The 2012 *Fiscal Sustainability Report* addresses the challenges of fiscal sustainability at a time of financial and fiscal crisis along with the implications of population aging.

The report finds that the challenges for fiscal sustainability (as reflected by the S1 and S2 indicators) are at medium risk in both the medium and long term.

The long-term sustainability gap measured by the S1 indicator is 1.8% of GDP for the EU27 and 1.7% for the eurozone, whereas the long-term sustainability gap reflected by S2 is 2.6% of GDP for the EU and 2.1% of GDP for the eurozone.

However, the differences between member states are sometimes significant – for example in the case of the S2 indicator in countries with sustainable public finances, such as Italy (–2.3) and Latvia (–0.7), compared with economies where the sustainability gap exceeds 6% of GDP, such as Belgium, Cyprus, Luxembourg, and Slovakia.

The S1 and S2 indicators quantify the gap that must be closed to maintain and/or restore fiscal sustainability. The decomposition of both indicators makes it possible to identify factors that influence sustainability or un-sustainability (e.g. initial budgetary position, cost of aging or the debt level).

Poland, compared with Europe as a whole, proves to be at medium sustainability risk in the medium term (S1 indicator at 0.1% of GDP) and at low risk in the long term (S2 indicator at 1.5% of GDP).

However, these positive results depend on full fiscal consolidation and on maintaining the primary balance well beyond 2014 at the target level assumed in the analysis (a primary balance surplus of 1% of GDP). The report emphasizes that if this level is not met[25] or if there is a return to the lower values of the primary balance observed in the past (the average primary balance in the 1998–2012 period showed a deficit of 1.7% of GDP), risks to fiscal sustainability in both the medium and long term will be much greater. It needs to be added, however, that the sustainability analysis conducted in the report did not take into account the recent increase in the statutory retirement age in Poland to 67 years for both men and women. This change entails consequences for fiscal sustainability and as a result the S1 and S2 indicators will improve slightly in terms of the initial budgetary position and the aging cost component (to be precise, the latter will be positive for the S1 indicator while being neutral for the S2 indicator). Overall, the reform strengthens the medium- and long-term sustainability of public finances in Poland.

The most general conclusion that can be drawn from the report findings is that, while continued fiscal discipline is necessary for the sustainability of public finances, it may not be sufficient when considering the implications of demographic trends. Apart from a traditional fiscal consolidation process, a credible entitlement reform strategy (pensions, healthcare, long-term care) may often be needed to address the projected growth in age-related spending. In fact, the aging population alone is reason enough why fiscal sustainability analysis should gain importance.

Sweden is a model example of a country that coped extremely well with the crisis, but the fiscal sustainability analysis shows the country faces challenges related to demographics. Sweden was able to maintain fiscal discipline during the financial crisis and was the only country in Europe that managed to

25 See footnote 27.

lower its debt-to-GDP ratio in the 2008–2012 period. Both sustainability indicators, S1 and S2, show low medium- and long-term risk for Sweden. In particular, the value of the S1 indicator is negative and runs at –3.6% of GDP, which means far below the EU average of 1.8% of GDP. However, taking into account the infinite time horizon, the decomposition of the S2 indicator shows that the long-term cost of aging, at 2.7% of GDP, is above the EU average of 2.2% of GDP and the overall fiscal position is at low risk due to the strong initial budgetary position (IBP). Therefore, a natural conclusion drawn from the analysis for Sweden is that it should address the long-term fiscal sustainability gap by conducting entitlements reforms[26]. The analysis contained in the report makes it possible to identify such challenges.

An undeniable value of the report is that it draws attention to the impact of political economy factors. According to the report's latest forecast for government debt (2014), about half the member states are expected to have a debt-to-GDP ratio above the 60% of GDP threshold. Moreover, some countries (e.g. Italy, Belgium, France, and the United Kingdom) would need to reduce their debt-to-GDP ratios by at least 30 p.p. to reach that threshold. Needless to say, a high level of debt involves a high interest burden, hence the need for maintaining a large primary surplus in order to secure debt sustainability. Gaining political support for a prolonged period of adjustment can be challenging, particularly in adverse cyclical conditions and when additional efforts are required to address age-related costs. The report identifies this as a risk in terms of the projected debt trajectory.

Italy is a good example to illustrate the impact of political economy factors. In the forecast for 2014, government debt is estimated at 126.5% of GDP, 66.5 p.p. above the required threshold. Therefore, the DR component of the S1 indicator is 3.7% of GDP and adds to the primary balance to bring the debt to the 60% of GDP threshold by 2030. However, the 2014 structural primary balance for Italy is forecast at 5% of GDP, which means at an even higher level. This does not alter the fact that maintaining such high primary surpluses by 2030 will be extremely difficult for sociopolitical reasons.

To sum up, the *Fiscal Sustainability Report 2012* deserves a positive assessment. The challenges of the financial crisis – which subsequently turned into a debt crisis – coupled with dramatic demographic changes, make fiscal sustainability an increasingly important issue.

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ŚREDNIO- I DŁUGOOKRESOWA STABILNOŚĆ FISKALNA W EUROPIE

Streszczenie

Celem artykułu jest przedstawienie koncepcji stabilności fiskalnej w świetle raportu Komisji Europejskiej *Fiscal Sustainability Report 2012* oraz jego krytyczna analiza.

Analiza rozpoczyna się od przedstawienia ogólnej koncepcji stabilności fiskalnej, a następnie wprowadza podejście zastosowane w raporcie. Szczegółowo przedstawione zostały wskaźniki stabilności fiskalnej S1 i S2 w kontekście kryzysu zadłużenia, procesu starzenia się społeczeństwa, a także przy uwzględnieniu implikacji płynących z ekonomii politycznej.

Przyjęta przez autora metodologia opiera się na podejściu analitycznym, które umożliwia ocenę stabilności fiskalnej. Ponadto w artykule zastosowano analizę opisową oraz metodę porównawczą. Zostały skomentowane wyniki pomiaru stabilności fiskalnej w Europie i w Polsce. Zakres analizy stabilności finansów publicznych został rozszerzony o Polskę w celu uwzględnienia podwyższenia ustawowego wieku emerytalnego do lat 67 dla kobiet i mężczyzn oraz ukazania jego wpływu na stabilność finansów publicznych w średnim i długim horyzoncie czasowym.

W końcowej części artykułu, oprócz wniosków, wyodrębnione zostały zalety i wady podejścia zastosowanego w raporcie. Pomimo faktu, że przedstawiona tam koncepcja nie może zostać bezpośrednio zastosowana w bieżącej polityce gospodarczej – ze względu na wysoką wrażliwość wskaźników stabilności na zmiany parametrów – *Raport o stabilności fiskalnej* powinien służyć jako istotny dokument rządowy, regularnie uaktualniany, niemniej wymagający sporej dozy obiektywizmu.

Słowa kluczowe: stabilność fiskalna, wskaźniki stabilności fiskalnej S1 i S2, saldo pierwotne budżetu, dług publiczny, proces starzenia się społeczeństwa.

Kody JEL: H62, H63, H75, E62.