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# A Demographic Perspective of Fiscal Sustainability: "Not Just the Immediate-Term Matters"

**Global Demographics Research**

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## Aging-related expenditures are one of the fastest growing components of government expenditures

"In coming decades, many forces will shape our economy and our society, but in all likelihood no single factor will have as pervasive an effect as the aging of our population." Fed Chairman Ben Bernanke (October 4, 2006).

".....The seriousness of the challenge depends on how our economies and societies respond and adapt to these changing demographic conditions. Looking ahead policymakers need to ensure long-term fiscal sustainability in the face of clearly anticipated risks as well as significant uncertainty" 2009 Aging Report, Economic Policy Committee and European Commission.

- We illustrate the ongoing demographic changes in the most advanced economies. Significant variations in their life expectancies and fertility rates translate into very different old-age dependency ratios, which consequently lead to differential increases in their fiscal burdens.

- We present and discuss the latest aging-related expenditures projected by the EU, US, Japan and Switzerland. These government projections make for a warning to all sections of society for the future. Fiscal unsustainability becomes more likely in the future in the face of longer-term obligations that have not yet been significantly renegotiated. We show the relative pension benefits across selected economies, noting Greece and Spain's high benefits.

- A decomposition of the increased public pension expenditures highlights the major drivers across these advanced economies, providing leads for where and how policy changes should influence these drivers.

- .The conventional deficit measures are easy to use and interpret but have many significant limitations, a major one being the ignorance of contingent liabilities. We present a conventional yet longer-term fiscal sustainability measure, the sustainability gap, which provides a comparable metric that fiscal policies can target. We also highlight Generational Accounting as an alternate approach to looking at conventional deficits. Estimates for Fiscal Imbalance and Generational Imbalances for the US are also presented.

- Governments and markets need to focus on changing employment and longevity patterns as their budgets are intimately linked to it. It is essential to start renegotiating benefits of pensions and health care for non-retirees.

## A Demographic Perspective of Fiscal Sustainability

Rapid and unprecedented demographic changes are adversely affecting most advanced countries. In this report[1], we provide an introduction to the acknowledged, yet not easily defined, concept of fiscal sustainability. We view fiscal sustainability as an ongoing concept, not just for now but for the future, and consider it to be very important not only over time but also across generations. We provide a selective assessment of the major demographic changes, current as well as projected, on the fiscal sustainability of countries.

The governments of rich countries face the prospect of much slower GDP growth due to the combined effect of aging populations and labour forces. Slowing GDP growth along with the obligations to fulfill longer-term past promises made to citizens is leading to large fiscal strains and unsustainable finances in many of the most advanced nations. We believe strongly that current measures of fiscal deficits and debt do not adequately account for these long-term fiscal burdens and highlight two alternative approaches, namely “Sustainability Gap” and “Generational Accounting” which try to address some of the limitations of commonly used fiscal deficit measures. In light of this analysis, we believe countries need to embrace active policies that will help them address their demographic challenges and thereby improve their fiscal sustainability.

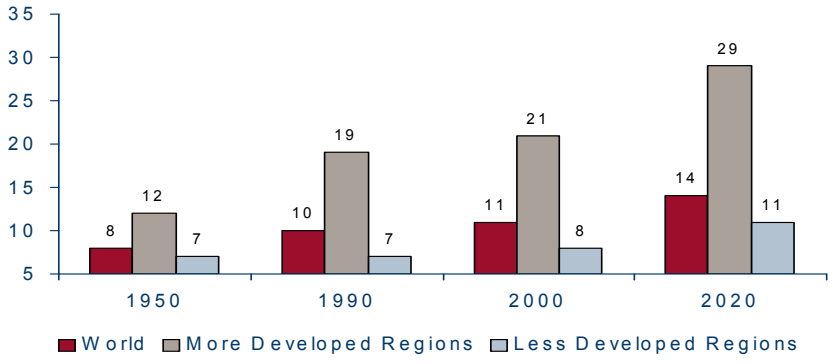
We present an initial overview of the adverse demographics and the current fiscal positions of 12 selected advanced countries. Then we discuss the longer-term aging-related government expenditure projections and their underlying drivers. After that we focus on the limitations of short-term fiscal measures and emphasize two alternative measures based on the concepts of Fiscal Sustainability and Generational Accounting. We conclude by suggesting policy measures in the areas of pensions, health care and long-term care.

## Demographics

We present selected demographic indicators in order to facilitate cross-country comparisons of the impact of aging on fiscal balances. Exhibit 1 presents the old age dependency ratios, a critical demographic feature that causes underlying fiscal strains of the older and richer countries.

**Exhibit 1: Old Age Dependency Ratio – Regions**

Ratio of 65+ population per 100 working age persons (15- to 64-year-olds)




Source: Credit Suisse, UN

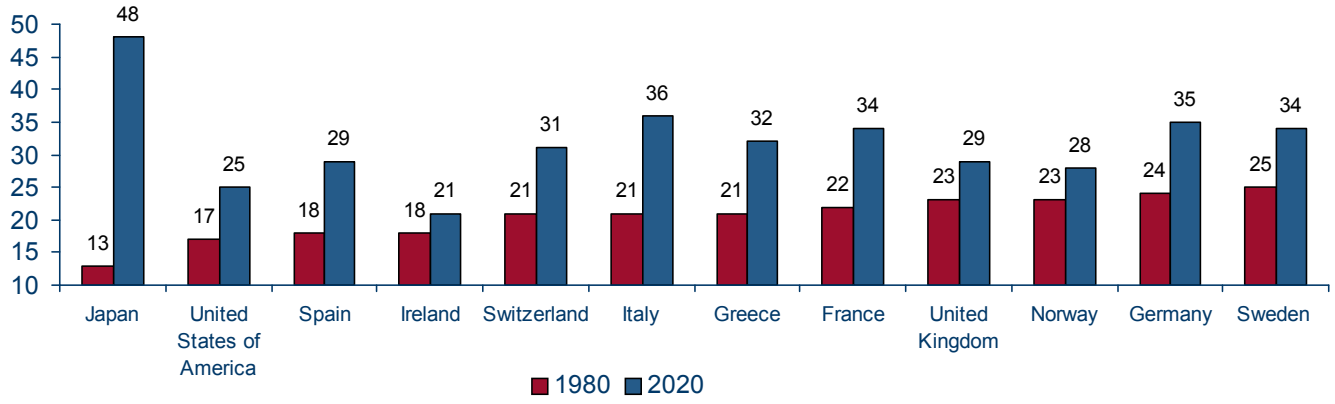
The old age dependency ratio has increased much more in the more developed regions than the less developed regions (UN, World Bank definitions) over 1950-2020E. This reflects the greater speed of aging in the advanced countries of the world relative to the poorer ones.

[1] This report is an extended version of a piece in Credit Suisse Research Institute's Publication (Jan 2010) titled "Country Indebtedness 1"

Next, we consider the old age dependency ratios over 1980-2020E in 12 selected advanced countries: France, Germany, Italy, Japan, Norway, Sweden, Switzerland, Greece, Spain, Ireland, the UK and the US. Exhibit 2 displays the dramatic rise in old age dependency ratios across all of these countries. The range of old age dependency ratios has nearly doubled at the lower and upper end over the 1980-2020 period. In 2020, Japan is projected to stand out as the country with the highest old age dependency ratio followed by a tight pack of four countries: Italy, Germany, France and Sweden.

**Exhibit 2: Old Age Dependency Ratios – 1980 and 2020E**

(Ratio of 65+ to 100 persons of working Age 15-64)



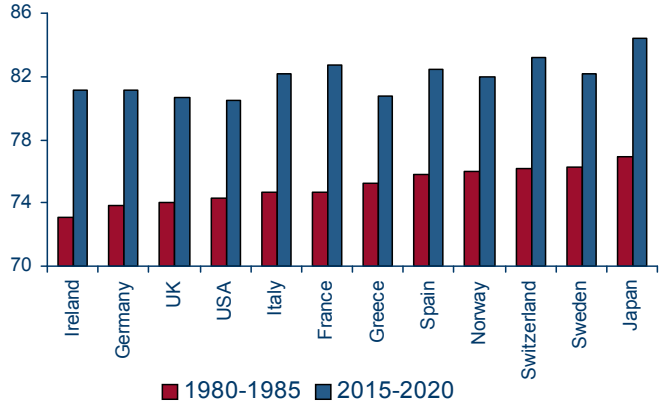

Source: Credit Suisse, UN

The rapid increase in the old age dependency ratios reflects the trends in two underlying demographic indicators – life expectancy at birth and total fertility rates (the number of children per woman of child-bearing age).

Life expectancy at birth is projected to increase for all 12 selected advanced countries between 1980 and 2020, as in Exhibit 3. Japan had the highest life expectancy in 1980-1985 among all 12 advanced nations and is projected to have the highest figure in 2015-2020. The increase in life expectancy at birth is projected to be the highest for France (from 74.7 years in 1980-1985 to 82.7 years in 2015-2020) and Ireland (from 73.1 years in 1980-1985 to 81.1 years in 2015-2020). As in Exhibit 4, total fertility rates are falling across all advanced countries, as women have fewer children. What is noticeable is the dramatic decrease in fertility rate levels across all developed regions relative to the break-even fertility rate of 2.1 children/woman required to replace population levels.

**Exhibit 3: Life Expectancy at Birth**

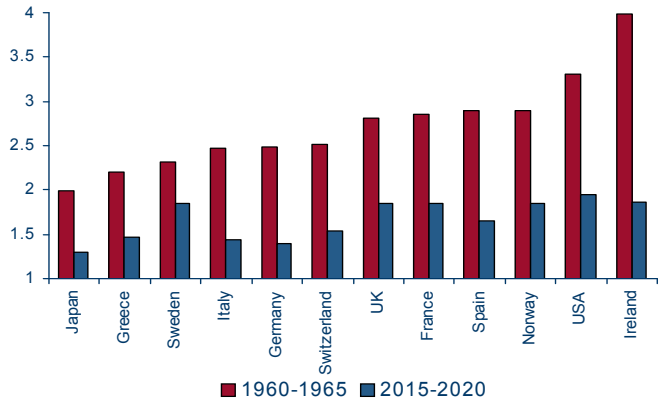
Years, Both Sexes Combined




Source: Credit Suisse, UN

**Exhibit 4: Total Fertility Rates**

Number of children per woman of Child bearing age




Source: Credit Suisse, UN

The most dramatic demographic change has occurred from 1950-2000 and its projected continuation until 2050 appears likely[2]. Overall, the combination of the post-war baby boom, the rapid fertility rate declines from the end of the 1960s and increasing life expectancy are all leading to the progressive aging of the population in the richer countries. This will impact their public finances significantly as the baby-boom generation reaches retirement age in coming decades. Policymakers and society in these "rich" countries should worry about how living standards will be affected given higher old age dependency ratios and substantially lower GDP growth[3].

## Fiscal Positions and Age-Related Government Expenditures

The fiscal positions of the 12 selected countries – France, Germany, Italy, Japan, Norway, Sweden, Switzerland, Greece, Spain, Ireland, the UK and the US – are presented in Exhibit 5. Note the fiscal deficits reached their highest levels in 2009, not a surprise given the scope and magnitude of the current crisis. Beyond the near term, the fiscal positions are projected to improve in the medium term but remain weaker than those before the crisis, reflecting demographic forces in most of these countries except Germany.

In comparative terms, the general government balances of the US, the UK, Spain and Ireland are the weakest for 2009 followed by Japan, given the greater and broader impact of the current crisis in terms of employment, GDP, industry and other broad economic measures, including business and consumer sentiment.

**Exhibit 5: General Government Balance**

(Percentage of GDP)

| | 1990 | 2000 | 2005 | 2009 |
|---|---|---|---|---|
| United Kingdom | -1.6 | 1.4 | -3.3 | -11.6 |
| Germany | -2.0 | 1.3 | -3.3 | -4.2 |
| Italy | -11.4 | -0.8 | -4.3 | -5.6 |
| France | -2.4 | -1.5 | -2.9 | -7.0 |
| Norway | 2.2 | 15.4 | 15.1 | 7.1 |
| Greece | -14.5 | -3.7 | -5.1 | -6.4 |
| Spain | -3.6 | -1.0 | 1.0 | -12.3 |
| Ireland | -2.8 | 4.8 | 1.6 | -12.1 |
| Sweden | 3.4 | 3.8 | 2.0 | -3.5 |
| Switzerland | -0.2 | 2.2 | 0.1 | -1.5 |
| United States | -4.2 | 1.6 | -3.2 | -12.5 |
| Japan | 2.0 | -7.6 | -5.0 | -10.5 |

Source: Credit Suisse, World Economic Outlook, IMF

We present another measure of public indebtedness in Exhibit 6 which shows the General Government Financial Liabilities as a percentage of GDP. We further convert these liabilities to USD billions and also to a per capita figure for 2009 in order to facilitate cross-country comparisons while adjusting for population size.

[2] See Credit Suisse Research (2006), *Why Demographics Matters? And How?*
[3] See Credit Suisse Research (2008), *A Demographic Perspective of Economic Growth*

**Exhibit 6: General Government Gross Financial Liabilities**

| | Percent of nominal GDP | | | In Billions of USD | Per Capita (USD 000's) |
|---|---|---|---|---|---|
| | 2000 | 2005 | 2009 | 2009 | 2009 |
| United Kingdom | 45.1 | 46.1 | 71.0 | 1561.13 | 25.36 |
| Germany | 60.4 | 71.1 | 77.4 | 2502.81 | 30.46 |
| Italy | 121 | 119.9 | 123.6 | 2582.17 | 43.13 |
| France | 65.6 | 75.7 | 84.5 | 2227.34 | 35.73 |
| Norway | 34.2 | 49.1 | 59.9 | 221.03 | 45.93 |
| Greece | 114.9 | 114.5 | 114.9 | 388.57 | 34.81 |
| Spain | 66.5 | 50.6 | 59.3 | 853.14 | 19.00 |
| Ireland | 40.2 | 32.7 | 65.8 | 149.16 | 33.04 |
| Sweden | 64.7 | 60.7 | 52.7 | 209.57 | 22.66 |
| Switzerland | 52.5 | 56.4 | 44.4 | 214.72 | 28.37 |
| United States | 54.4 | 61.3 | 83.9 | 11967.28 | 38.03 |
| Japan | 135.4 | 175.3 | 189.3 | 9554.87 | 75.14 |

Source: Credit Suisse, IMF, OECD

There is substantial literature on why the widely reported conventional fiscal deficit measures do not always work and their limitations. There are a set of alternative fiscal deficit measures, each with its own advantages and disadvantages. As the IMF reports "***although the deficit measure is relevant primarily as an indicator of the macroeconomic consequences of fiscal policy, the set of consequences that policymakers desire to assess may itself determine the "correct" deficit measure. In other words, there is no such thing as the fiscal deficit, but rather a series of alternate measures, each with its advantages and disadvantages.***"

"An important issue here is that the conventional measure of the fiscal deficit (govt. expenditures less current revenues) has widely accepted limitations as a measure of excess public demand. Therefore, the use of just one number to assess the impact of fiscal policy on aggregate demand, inflation and other macroeconomic variables needs to be de-emphasized and the broader fiscal situation should be analyzed. [4]"

For example, **inflation has complex effects** on the conventional deficit in the presence of floating interest rate debt, making it hard to evaluate the meaning and implication of the conventional deficit numbers. It makes fiscal performance evaluation difficult when debt composition changes over time and confounds international comparisons of countries' fiscal deficits with varying inflation and differing debt profiles.

The conventional measure of fiscal balances also tends to **overstate the health of fiscal policy** during expansions and understate it during contractions. This is because tax revenues are pro-cyclical, as major portions of the tax base such as private income and personal consumption fall during a recession. On the other hand government outlays, which increase during recessions in the form of transfer programs, make them countercyclical. Overall the conventional budget balance has a tendency to move pro-cyclically, thus exaggerating or dampening the actual fiscal position during business cycles.

A very important **part of government policy is ignored in the conventional fiscal deficit measure, namely the adoption of contingent liabilities,** such as deposit insurance (very important during the recent crisis), social security, health insurance and loan guarantees, which do not generate a current cash flow but rather an obligation regarding future cash flows. While most of the focus of governments in power and policymakers is usually on short-term fiscal numbers (up to two years) and occasionally those over the medium term (up to 5 or 7 years), many of the slightly longer-term fiscal

[4] Vito Tanzi (1993), Fiscal Deficit Measurement: Basic Issues

promises owing to aging are now causing some to worry about how much these burdens could be and who will pay for them – the existing or future generations, as even alluded to by Chairman Bernanke in the opening quote of this report. We later define and discuss a newer macroeconomic concept of fiscal sustainability that has been developed to deal with this issue; it is a concept to which governments are paying greater attention. A comprehensive examination of fiscal policy and fiscal deficits should take into account the links between the short run and medium run as well as the long-run implications; in other words, the fiscal structure is important in defining fiscal deficits.

## Aging and increased government expenditures

A country's aging population strains its finances due to increased age-related spending on pensions, health care and long-term care. OECD, European Commission, academia and government organizations have developed a framework to project this age-related spending. Aging is getting to be an issue because post-retirement lifespans are increasing in most rich countries. Exhibit 7 shows life expectancy increases beyond age 65 over 1980-2006 for both males and females. Medical advances, better nutrition and lifestyles of the old over last three decades or so have led to such significant life expectancy increases.

While life expectancy increases have been fairly uniform across rich countries, the retirement periods have not changed that similarly with regard to males. Note the consistently higher female life expectancies relative to males at age 65, i.e., women outlive men and have longer post-retirement spans, although their working lives are shorter on average.

**Exhibit 7: Life Expectancy at Age 65**

(in years)

| | Men | | Women | |
|---|---|---|---|---|
| | **1980** | **2006** | **1980** | **2006** |
| United Kingdom | 12.6 | 17.3 | 16.6 | 20.1 |
| Germany | 12.8 | 17.2 | 16.3 | 20.5 |
| Italy | 13.3 | 17.8 | 17.1 | 21.6 |
| France | 13.6 | 18 | 18.2 | 22.3 |
| Norway | 14.3 | 17.7 | 18.2 | 20.9 |
| Greece | 14.6 | 17.4 | 16.8 | 19.6 |
| Spain | 14.6 | 17.9 | 17.8 | 22 |
| Ireland | 12.6 | 16.8 | 15.7 | 20.2 |
| Sweden | 14.3 | 17.6 | 17.9 | 20.8 |
| Switzerland | 14.3 | 18.5 | 18.2 | 22.1 |
| United States | 14.1 | 17.4 | 18.3 | 20.3 |
| Japan | 14.6 | 18.5 | 17.7 | 23.4 |

Source: Credit Suisse, OECD

Exhibit 8 shows that projected EU27 age-related public expenditures increase by about 2.7 percentage points of GDP over 2007-2035 and by 4.7 percentage points of GDP over 2007-2060. Most of the projected increase in public spending over the period 2007-2035 will be on pensions.

For the individual EU member states, the following can be noted:

- The **age-related increase in public spending will be very significant** in nine member states (Luxembourg, Greece, Slovenia, Cyprus, Malta, Romania, the Netherlands, Spain and Ireland) with a projected increase of 7 p.p. of GDP or more, although for some countries the large increase will be from a fairly low level. These member states have so far made only limited progress in reforming their pension systems or have maturing pension systems.

- For a second group of countries – Belgium, Finland, the Czech Republic, Lithuania, Slovakia, the UK, Germany and Hungary – the **age-related increase in public spending is more limited**, ranging from 4 p.p. to 7 p.p. of GDP. Several of these countries have taken significant steps in reforming public expenditure systems that contribute to limit the increase in future expenditure.
- Finally, the **increase is more moderate**, 4 p.p. of GDP or less, in Bulgaria, Sweden, Portugal, Austria, France, Denmark, Italy, Latvia, Estonia and Poland; this is also thanks to the implementation of substantial pension reforms. For many of them, the projected increase in expenditure on health care and generally on long-term care is higher than increases in pension.

According to one of the scenarios that takes into account the combined impact of aging, potential improvements in health status, and the effect of changes in the national income, public expenditure on health care is projected to grow over 2007-35 by 1.0% of GDP in the EU27.

**Exhibit 8: Age-Related Expenditure Components**

(Percentage of GDP)

| Country | Pensions | | | Health Care | | | Long-term Care | | | Total (incl Education and Unemployment Benefits) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Level | Change from 2007 | | Level | Change from 2007 | | Level | Change from 2007 | | Level | Change from 2007 | |
| | 2007 | 2035 | 2060 | 2007 | 2035 | 2060 | 2007 | 2035 | 2060 | 2007 | 2035 | 2060 |
| EU27 | 10.2 | 1.7 | 2.4 | 6.7 | 1 | 1.5 | 1.2 | 0.6 | 1.1 | 23.1 | 2.7 | 4.7 |
| UK | 6.6 | 1.3 | 2.7 | 7.5 | 1.2 | 1.9 | 0.8 | 0.3 | 0.5 | 18.9 | 2.7 | 5.1 |
| Germany | 10.4 | 1.4 | 2.3 | 7.4 | 1.4 | 1.8 | 0.9 | 0.7 | 1.4 | 23.6 | 2.6 | 4.8 |
| Italy | 14 | 1.2 | -0.4 | 5.9 | 0.9 | 1.1 | 1.7 | 0.5 | 1.3 | 26 | 2 | 1.6 |
| France | 13 | 1.4 | 1 | 8.1 | 1 | 1.2 | 1.4 | 0.5 | 0.8 | 28.4 | 2.7 | 2.7 |
| Norway | 8.9 | 4.3 | 4.7 | 5.6 | 1 | 1.3 | 2.2 | 1.2 | 2.7 | 24.9 | 6.8 | 9 |
| Greece | 11.7 | 7.7 | 12.4 | 5 | 0.9 | 1.4 | 1.4 | 0.8 | 2.2 | 22.1 | 9.1 | 15.9 |
| Spain | 8.4 | 3.4 | 6.7 | 5.5 | 1 | 1.6 | 0.5 | 0.5 | 0.9 | 19.3 | 4.3 | 9 |
| Ireland | 5.2 | 2.8 | 6.1 | 5.8 | 0.9 | 1.8 | 0.8 | 0.4 | 1.3 | 17.2 | 3.7 | 8.9 |
| Sweden | 9.5 | -0.1 | -0.1 | 7.2 | 0.6 | 0.8 | 3.5 | 1.3 | 2.3 | 27.2 | 1.5 | 2.6 |
| Source: European Commission, EPC 2009 | | | | | | | | | | | | |

| Country | Old Age/Disability Insurance | | | Health Care | | | Long-term Care | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Level | | Change | Level | | Change | Level | | Change | Level | | Change |
| | 2005 | 2050 | 2005-2050 | 2005 | 2050 | 2005-2050 | 2005 | 2050 | 2005-2050 | 2005 | 2050 | 2005-2050 |
| Switzerland | 10.3 | 13.1 | 2.8 | 4.4 | 5.8 | 1.4 | 0.5 | 1.4 | 0.8 | 15.2 | 20.2 | 5 |
| Source: Federal Finance Administration,2008 | | | | | | | | | | | | |

| Country | Social Security | | | Total Medicare | | | Total Medicaid | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Level | | | Level | | | Level | | | Level | | |
| | 2009 | 2050 | 2080 | 2009 | 2050 | 2080 | 2009 | 2050 | 2080 | 2009 | 2050 | 2080 |
| US | 4.8 | 5.7 | 6.1 | 3.5 | 9 | 13.5 | 1.8 | 3.2 | 3.7 | 10.1 | 17.9 | 23.3 |
| Source: Congressional Budget Office: June 2009 | | | | | | | | | | | | |

| Country | Pension | | | Health Care | | | Long Term Care | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Level | | | Level | | | Level | | | Level | | |
| | 2010 | 2030 | 2050 | 2010 | 2030 | 2050 | 2010 | 2030 | 2050 | 2010 | 2030 | 2050 |
| Japan | 9.7 | 10.7 | 13.7 | 7.1 | 8.9 | 7.3 | 1.5 | 2.8 | 4.3 | 18.3 | 22.4 | 25.3 |
| Source: The Japanese Journal of Social Security Policy, Aug 2009 | | | | | | | | | | | | |

In Switzerland, public spending in the three given areas (Old Age/Disability Insurance, Healthcare and long-term care) will increase by five percentage points of GDP by 2050, from 15.2% to 20.2% of GDP. The largest component of the increase is on public pensions. The impact is quite unexceptional up to 2020. After 2020, the pressure exerted by changing demographics increases considerably: up to 2030, the additional old age insurance expenditures increase to around two percentage points of GDP and by 2050 to almost three percentage points of GDP. Demographic change also increases the additional expenditures in health care and long-term care.

For the US, according to the CBO's 2009 projections, the growth in entitlement spending explains almost all of the projected growth in total non-interest spending, with Medicare and Medicaid programs largely contributing to that growth. Medicare and Medicaid are

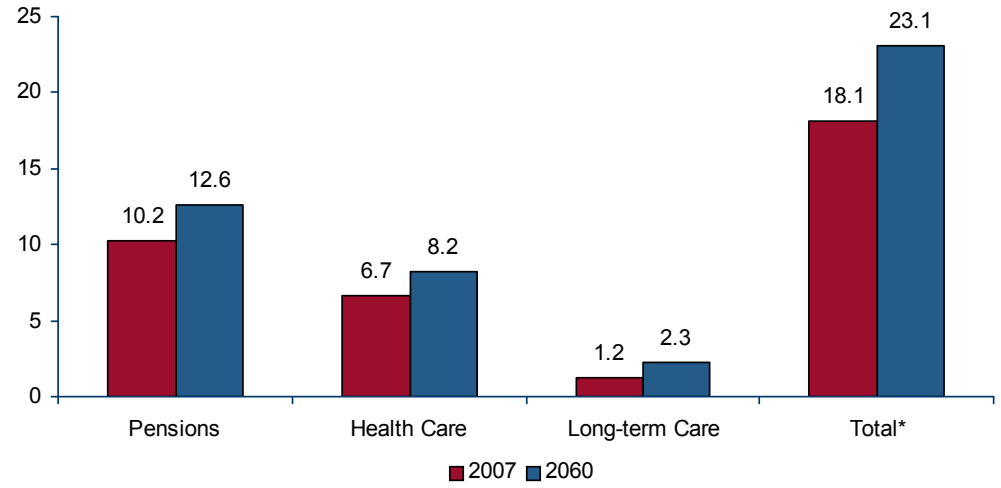
responsible for 80% of the growth in spending on the three largest entitlements (Health and Social Security programs) over the next 25 years and for 90% of that growth by 2080.

For Japan, according to the simulation results by Fukawa and Sato (2009), public pension expenditure will be 10.7% of GDP, health expenditure will be 8.9% of GDP, and long-term care expenditure will be 2.8% of GDP in 2030. The individual components aggregate to a total of 22.4% of GDP in 2030 in contrast to 18.3% in 2010.

Exhibit 9 provides a graphical breakdown of age-related expenditure in EU 27 (excluding education and unemployment benefits). Note that the largest component of the age-related expenditures is pensions; later we discuss the benefits promised by select countries in terms of replacement ratios.

**Exhibit 9: Age-Related Expenditure in EU 27**

(Percentage of GDP)




*Total excludes education and unemployment benefits.

Source: Credit Suisse, European Commission, EPC 2009

It is important to analyze the drivers behind increased pension expenditures. Most of the share of the increase in public pension expenditure is due to old age and early pensions. In the US, the CBO projects that the number of workers per Social Security beneficiary will decline significantly over the next three decades. In the EU27, the public pension spending ratio is expected to increase considerably during 2020-2040.

Exhibit 10 looks at the components driving the pension expenditure to GDP ratio, namely dependency ratio, coverage ratio, employment rate, benefit ratio[5] and the interaction effect.

**Exhibit 10: Decomposition of Public Pension Expenditure**

$$\frac{\text{Pension Expenditure}}{\text{GDP}} = \underbrace{\frac{\text{Population 65+}}{\text{Population 15-64}}}_{\text{Dependency Ratio}} \times \underbrace{\frac{\text{Number of pensioners}}{\text{Population 65+}}}_{\text{Coverage Ratio}} \times \underbrace{\frac{\text{Population 15-64}}{\text{Working people 15-64}}}_{\text{Employment Rate}} \times \underbrace{\frac{\text{Average Pension}}{\text{GDP}} \Big/ \frac{\text{Hours Worked 15-71}}{}}_{\text{Benefit Ratio}} \times \underbrace{\frac{\text{Working People 15-64}}{\text{Hours Worked 15-71}}}_{\text{Interaction}}$$

Source: Credit Suisse, EPC & European Commission

[5] The average wage in the denominator of the benefit ratio is calculated as a ratio of gross wages and employed persons (employees and self-employed) aged 15 to 71 years.

It depends on the following factors: the rate of aging, which affects the 65+ population relative to working age population, the pensioners out of the population aged 65+, the fraction of working age people working, average pension relative to GDP per hour and an interaction effect.

The decomposition of the overall change in the public pension spending to GDP ratio over the period 2007-2060 in EU 27 is given in Exhibit 11. **The main contributor to the increase in the ratio of pension to GDP is represented by demographic factors** (captured by the old age dependency ratio), ranging from +4.2 p.p. to +12.7 p.p. in the case of the UK and Greece, respectively. For many member states, **the increase in the old age dependency ratio is the only factor pushing upward the pension to GDP ratio**, while the other factors contribute to keeping the pension/GDP ratio down.

**Exhibit 11: Public Pension Expenditure to GDP Ratio Decomposition**

(in percentage points)

| | | Sources of Change from 2007 to 2060 | | | | | |
|---|---|---|---|---|---|---|---|
| | 2007 level | Dependency Ratio[1] | Coverage ratio[2] | Employment effect[3] | Benefit ratio[4] | Interaction Effect[5] | 2060 level |
| EU27 | 10.1 | 8.7 | -2.6 | -0.7 | -2.5 | -0.6 | 12.5 |
| UK | 6.6 | 4.2 | -1.4 | -0.3 | 0.5 | -0.3 | 9.3 |
| Germany | 10.4 | 7.9 | -1.9 | -0.8 | -2.2 | -0.8 | 12.8 |
| Italy | 14 | 10.4 | -3.2 | -1.1 | -5.5 | -1 | 13.6 |
| France | 13 | 8.4 | -2.2 | -0.5 | -4 | -0.7 | 14 |
| Norway | 8.9 | 8.2 | -1.2 | 0.3 | -2.4 | -0.2 | 13.6 |
| Greece | 11.7 | 12.7 | -0.4 | -0.6 | 0.8 | -0.1 | 24.1 |
| Spain | 8.4 | 10.7 | -0.9 | -0.9 | -1.7 | -0.5 | 15.1 |
| Ireland* | 4 | 5.9 | -1.5 | -0.2 | 0.7 | -0.3 | 8.6 |
| Sweden | 9.5 | 5.6 | -0.4 | -0.4 | -4.3 | -0.6 | 9.4 |

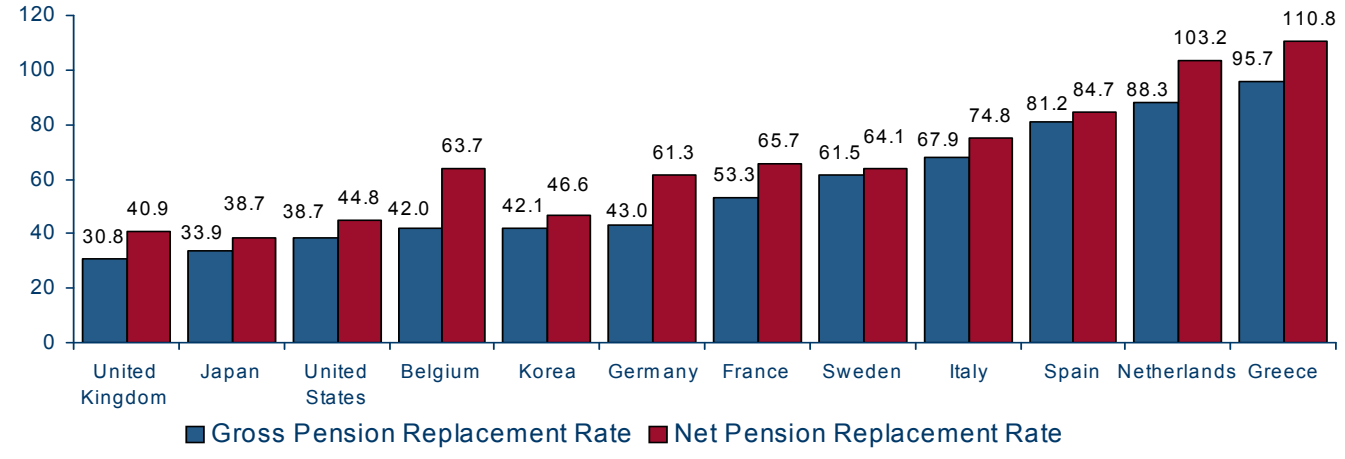
[1]Population 65+/Population 15-64; [2] Number of pensioners / Population 65+; [3] Population 15-64/ Working people 15-64
[4] Average pension/GDP/ Hours worked 15-71; [5]Working Age 15-64/ Hours Worked 15-71. * Discrepancy relative to Exhibit 8 as this calculation for Ireland is based on only Pillar 1 of public pensions whereas Table 8 includes public service component of Pillar 2 pensions

Source: Credit Suisse, EPC & European Commission

Public pension expenditure is also determined by how effectively a country's pension system provides a retirement income to replace earnings. Exhibit 12 presents the Gross and Net Replacement Rates for the average earner

**Exhibit 12: Gross and Net Pension Replacement Rates for the Average Worker**

Ratio of pension to pre retirement earnings for men



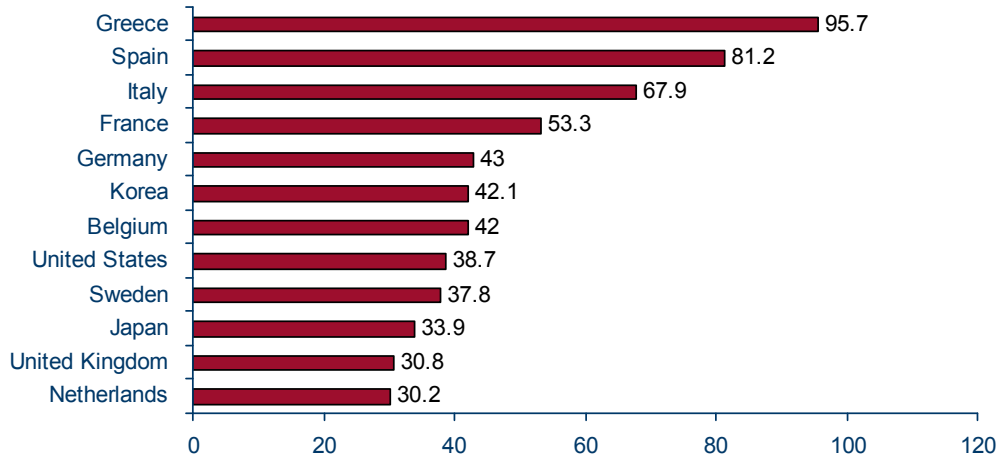

Source: Credit Suisse, OECD

The Gross Replacement Rate is defined as gross pension entitlement divided by gross pre-retirement earnings and the Net Replacement Rate is defined as net pension entitlement divided by net pre-retirement earnings, net of taxes and social security contributions paid by workers and pensioners.

As we are looking at public pension expenditure, it is more relevant to look at gross pension replacement rates from public schemes only as shown in Exhibit 13.The very high values for Greece, Spain, Italy and France can help explain the high public pension expenditures present in these countries as seen in Exhibit 8.

**Exhibit 13: Gross Pension Replacement Rates for the Average Worker from Public Schemes**

Ratio of pension to pre retirement earnings for men




Source: Credit Suisse, OECD

The projected increase in health care spending in EU27 is driven mostly by the change in the demographic structure of the population. Its impact is measured by the "pure demographic scenario," which projects an average increase of 1.7% of GDP. However, as empirical evidence suggests, it is the health status, rather than the age, that is the predominant causal factor behind health care spending. Under more optimistic assumptions about the health status evolution (illustrated by the "constant health scenario"), the demographic pressure on health care expenditure could be reduced by over a half, to only 0.7% of GDP.

In the US, both aging and excess cost growth should push up federal spending for Medicare and Medicaid as a share of GDP because growing numbers of elderly people will need increasingly expensive health care. Exhibit 14 attributes the expenditures on Social Security, Medicare and Medicaid to two components – aging and the increased cost of benefits. There are two time periods over which this decomposition is done: 2009-2035 and 2009-2080. Over the period 2009-2035, an aging population explains 64% of spending growth in Medicare, Medicaid, and Social Security in the US. Over the longer period, 2009-2080, in contrast, the growth in health care spending per beneficiary is a more important explanatory factor than population aging.

**Exhibit 14: Sources of Age-Related Projected Spending: (Medicare, Medicaid and Social Security)**

(in percentage)

| | Aging | Excess cost growth |
|---|---|---|
| 2009-2035 | 64 | 36 |
| 2009-2080 | 44 | 56 |

Source: Credit Suisse, CBO 2009

According to Hagist and Kotlikoff (2006), US government health care expenditures have grown at more than double the rate of GDP growth over 1970-2002 and based on current trends will amount to a third of GDP by 2050, with increased benefits accounting for 75% of the health care spending.

## Fiscal Sustainability

The concept of fiscal sustainability relates to a government's ability to maintain the same set of policies indefinitely while remaining solvent, i.e., servicing its debt obligations without explicitly defaulting on them. An unsustainable set of policies would thus lead to insolvency if indefinitely maintained, and governments often change their policies if it becomes clear that they are unsustainable. **The focus of fiscal sustainability is not only on default itself but also on the consequences of policy changes needed to avoid eventual default. Additionally fiscal sustainability analysis looks at the ongoing costs associated with a particular combination of fiscal and monetary policies.**

Two measures commonly used to analyze a government's fiscal position are government balance and government debt, which are related by the following budget constraint:

Net issuance of debt = Interest payments - Primary Balance – Seigniorage

Net issuance of debt is defined as the gross receipts from issuing new debt minus any amortization payments made in the period; the primary balance is defined as the difference between revenue and non-interest expenditure and seigniorage is defined as the net revenue derived from the issuing of currency.

The above budget constraint connects monetary policy to fiscal policy showing the interaction of currency issuance and debt issuance. Using the basic theory of the budget constraint, various results can be derived on the effects of government budget deficits and the coordination of monetary and fiscal policies.

- Budget deficits may not be inflationary and whether or not they are depends on how the deficits are financed over a government's lifetime. Under different policy regimes deficits can have different implications for inflation. If the government issues debt and prints no money to raise funds, then it would not lead to inflation. However if it prints money to finance the deficit, this would lead to inflation.
- Primary deficits that are not paid for by running primary surpluses in the future must inevitably lead to inflation or default.
- Lack of coordination of fiscal and monetary policies can lead to perverse outcomes, i.e., a tough monetary authority can, through its actions, worsen inflation outcomes if its actions are not coordinated with the fiscal authority.

In order to conduct fiscal sustainability analysis we need a simple set of tools that can help analyze a government's budget and debt positions, thereby assessing the appropriateness of its fiscal policy. The fundamental building block is the government's lifetime budget constraint. Intuitively the lifetime budget constraint states that the government finances its initial debt by raising seigniorage revenue and running primary surpluses in the future

whose present value is equal to its initial debt obligations. This assumes the fact that time is discrete and debt is real, is issued for one period and bears a constant real interest rate.

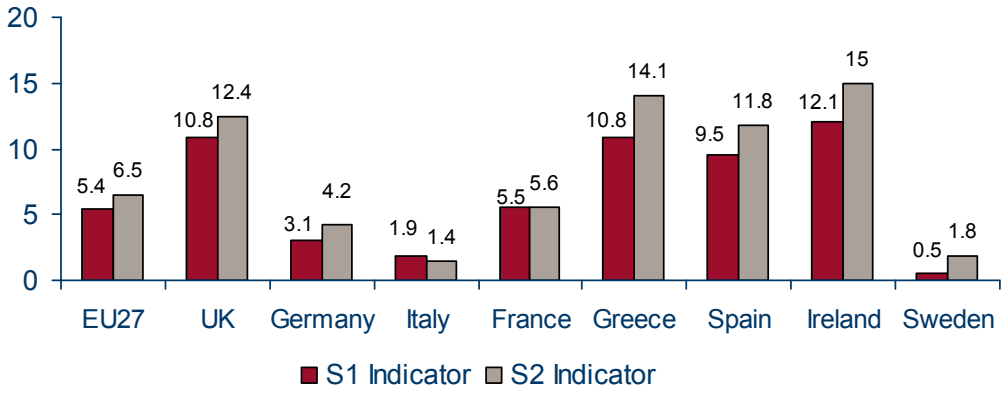
The simplest tool that can be derived using the **lifetime budget constraint is the long-run fiscal sustainability condition, which is a steady state version of the government's lifetime budget constraint.** This condition describes the size of the primary surplus the government must run to maintain solvency given a particular degree of indebtedness and given other assumptions that are made about policy and the economy.

In order to assess the sustainability of fiscal policy, the European Commission's Sustainability Report 2009 derives **two main sustainability gap indicators: S1 and S2**. Both S1 and S2 show the size of the permanent budget adjustment required to ensure that the public budget constraints are met. **S1** shows the adjustment to the current primary balance required to reach a target government gross debt of 60% of GDP in 2060, including paying for any additional expenditure arising from an aging population. **S2** shows the adjustment to the current primary balance required to fulfill the infinite horizon inter-temporal budget constraint, including paying for any additional expenditure arising from an aging population.

The value of the S2 indicator shows a sustainability gap of 6.5% of GDP for the whole EU and of 5.8% of GDP for the euro area, albeit with wide variation between countries. The S1 indicator shows a sustainability gap for the EU countries and for the euro area, of 5.4% and 4.8% of GDP, respectively. The long-term cost of aging (LTC) contributes 3.2 points to the S2 gap and 2 points to the S1 gap for EU27, while contributing 3.5 points and 2.4 points, respectively, for the S2 and S1 gaps in the euro area. **This shows that the long-term cost of aging has a significant fiscal impact on average.** The wide variations between the EU countries are illustrated in Exhibit 15 where we note the very high sustainability gaps that exist in the UK, Ireland and Greece

**Exhibit 15: Sustainability Gap Indicators in EU Countries**

(Percentage of GDP)




Source: Credit Suisse, EPC

Along similar lines, a report on the long-term sustainability of public finances in Switzerland (Federal Finance Administration) in 2008 derives the fiscal gap, which shows the immediate and permanent change in the budget balance needed to ensure a certain debt target by the end of the given time horizon. Two different calculations are used for the fiscal gap. In the first variant, the debt target is the 2003 debt ratio, i.e., 49% of GDP. The fiscal gap thus comes to 1.4% of GDP. The second variant refers to the (nominal) debt level in 2003, i.e., CHF 216 billion, which implies a declining debt ratio over time. The fiscal gap then comes to 2.0% of GDP.

In the US, the fiscal gap calculated by the CBO for 2009 is 2.1% of GDP over the next 25 years and 3.2% of GDP over the next 75 years. In other words an immediate and permanent reduction in spending or an immediate and permanent increase in revenues equal to 3.2% of GDP would be needed to create a sustainable fiscal path for the next three-quarters of a century.

Japan currently has the oldest population when measured in terms of median age. The key to the country's fiscal sustainability is the government's ability to control its expenditure particularly for the elderly. The government needs to take some bold steps to reduce future social security expenditure. According to simulations[6] done by Credit Suisse's Japan Economics Research team, a reduction in the Japanese expenditure on the elderly (public pensions and healthcare) of 1.5% per annum per capita is needed for convergence of the public debt-to-GDP ratio by 2055 to the current level. These simulations are done under a realistic tax hike scenario (raising the sales tax rate to 14% from 5% today) and assuming 0% for the trend nominal GDP growth rate and 1.5% for the average public debt cost.

Exhibit 16 provides an at-a-glance summary of the different fiscal gap indicators for the EU, Switzerland and the US. What is important to appreciate is that different countries have different fiscal objectives as their targets, which ultimately influences the fiscal gaps that they calculate.

**Exhibit 16: Fiscal Gap Indicators – Selected Countries/Regions**

| **Adjustment required to current primary balance to:** | | (Percent of GDP) |
|---|---|---|
| Attain government gross debt of 60% of GDP in 2060 (S1 indicator) | EU | 5.40% |
| Satisfy infinite horizon inter temporal budget constraint (S2 indicator) | EU | 6.50% |
| Attain the debt target of 2003 debt ratio, i.e., 49% of GDP in 2050 | Switzerland | 1.40% |
| Attain the debt level from 2003, i.e., CHF 216 billion in 2050 | Switzerland | 2.00% |
| Attain the debt to GDP ratio over 25 years as prevailed in 2009 | US | 2.10% |

Source: Credit Suisse, CBO, FFA, EPC

## Generational Accounting

Following criticism of conventional fiscal deficit measures to account for a government's longer-term fiscal obligations, Generational Accounting was developed as an alternative approach. **The backward-looking nature of measures such as deficits and debt make it difficult to gauge whether or not future fiscal commitments are affordable**. These conventional measures relate to the government's current cash flow and hence do not give much information on the longer-term effects of fiscal policy on saving, investment and growth.

To address these limitations of conventional measures, two alternate measures have been proposed by Gokhale and Smetters (2003, 2006). The first one is the **fiscal imbalance (FI)** which equals the current level of debt held by the public plus the present discounted value of future federal non-interest expenditures less the present discounted value of future federal receipts. Hence it shows the extent to which current US federal policy is not sustainable and equals zero for a sustainable policy.

The second measure, the **generational imbalance (GI)**, captures the intergenerational redistributive effects of policies such as pay-as-you-go (PAYG) pension plans. It helps us answer the question: ***Which generation will pay for what the government spends?*** This measure calculates the contribution of past and current generations to fiscal imbalance, i.e., the amount of overspending by past and current generations under current law. Such a measure is highly useful in looking at the fiscal impact of pay-as-you-go pension systems.

[6] Japan Economic Analysis Issue No 10

A strict pay-as-you-go financed retirement benefit has no effect on either traditional budget measures or on FI since the costs of such a program are, by construction, financed out of contemporaneous receipts. Still, such a program would transfer resources toward older people who would receive a benefit without having paid much in taxes when working and would reduce national savings. This transfer to older generations is financed by younger and future generations, who pay more taxes under this program relative to their benefits in present value. According to Auerbach, Gokhale and Kotlikoff[7], in the case of the United States, **had the government historically labeled contributions to social security as "loans" to the government, rather than as "taxes," the official U.S. debt would be more than three times its current level.**

Thus generational imbalance can be interpreted as the amount of "implicit debt" under current fiscal policy that past and current generations are passing to future generations, who must finance it through tax payments in excess of their benefits in present value.

Gokhale and Smetters (2006) calculate the value of fiscal and generational imbalance for the US and the results are summarized in Exhibit 17 (measured in constant US dollars). These calculations are based on long-term federal spending and revenue projections made for the budget of the US government for 2005. During the calculation of generational imbalance it is assumed that general revenue transfers are "appropriated" by the federal government for Medicare.

As an example in Exhibit 17, for 2010 the reported present value of social security's generational imbalance (11,676 bn. constant 2004 USD) is much higher than the corresponding fiscal imbalance (10,158 bn. constant 2004 USD). This indicates that more than 100% of social security's fiscal imbalance is accounted for by the excess of benefits over payroll taxes in present value, scheduled to be awarded to past and living generations in the US. A similar pattern holds for the earlier years 2004-2009 too. In contrast, for Medicare the generational imbalance in 2010 (32,289 bn. constant 2004 USD) is lower than the fiscal imbalance in 2010 (75,599 bn. constant 2004 USD).

**Exhibit 17: U.S. Federal Fiscal Imbalance and Generational Imbalance**

Present Values in Billions of Constant 2004 Dollars

| Fiscal Year | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|
| **Fiscal Imbalance** | | | | | | | |
| Total | 63,284 | 65,928 | 68,633 | 71,317 | 73,968 | 76,648 | 79,417 |
| Social Security | 8,006 | 8,352 | 8,709 | 9,067 | 9,422 | 9,784 | 10,158 |
| Medicare | 60,886 | 63,381 | 65,875 | 68,321 | 70,717 | 73,122 | 75,599 |
| Rest of federal government | -5608 | -5805 | -5951 | -6071 | -6171 | -6258 | -6,339 |
| **Generational Imbalance** | | | | | | | |
| Social Security | 9,549 | 9,899 | 10,256 | 10,609 | 10,958 | 11,310 | 11,676 |
| Medicare | 24,094 | 25,431 | 26,778 | 28,131 | 29,485 | 30,862 | 32,289 |

Source: Credit Suisse, Gokhale & Smetters (2006)- Fiscal and Generational Imbalances: An Update

**Generational Accounting helps calculate different generations' present expected values of remaining lifetime net payments to the government.** This is a more meaningful measure from the perspective of standard life cycle theory in order to determine the impact of government policy on individual consumption and saving. In the standard life cycle framework, a person's present value net payment to the government rather than his immediate cash-flow payment, measures his consumption response to government policy.

[7] *Generational Accounting: A New Approach for Understanding the Effects of Fiscal Policy on Saving* by Alan J Auerbach, Jagadeesh Gokhale and Laurence J Kotllikoff, May 1991

A generational account is thus a set of numbers, one for each existing generation, indicating the average remaining lifetime burden imposed by the government on members of the generation. **It indicates in present value what the typical member of each generation can expect, on net, to pay to the government now and in the future**. Such a measure helps measure intergenerational equity along with addressing issues of national saving, investment and growth.

The advantages of generational accounting over simple deficit measures are as follows:

- Generational accounting deals with inflation by measuring all payments and receipts in inflation- adjusted (constant) dollars.
- It directly considers the government's implicit obligations to make future transfer payments and to undertake future consumption spending. On the other hand, it also considers the public's implicit obligations to pay future taxes.
- In projecting transfers, spending, taxes, and the implied burden on future generations through time, generational accounting deals with the question of economic growth, including growth associated with demographic change.

## Policy Recommendations for Aging Countries

Coping with the budgetary impact of aging requires a three-pronged strategy in our view. These recommendations are better understood by looking at the schematic presented in Exhibit 10. First, aging countries need to achieve and sustain sound budgetary positions and to run down public deficits and debts faster. This would stimulate low interest rates and high and stable economic growth.

Second, countries need to raise employment rates, especially among women and older workers, and also to raise labour productivity. Successfully implementing measures that increase employment and enhance productivity would raise potential growth rates and improve future living standards as well as contribute to sustainability.

Third, countries need to reform pension, healthcare and long-term care systems to ensure they are viable and adequate. But pension reforms will be fully successful only if they are accompanied by longer and more flexible working lives. This would enable a higher accumulation of pension rights and would have a positive impact on the level of pensions relative to wages in the future.

Aging countries need to undertake specific policy measures to deal with pensions, health care and long-term care issues. The specific issues that need to be addressed as part of pension reforms are the following (i) tightening of eligibility rules for public pensions by increased retirement ages and implementing penalty deterrents for early retirement (ii) promoting employment for older workers and (iii) reducing generosity of pensions relative to wages. This will necessitate changes in training, education, tax systems, employment rules, etc.

The above complement the original recommendations in *New Jobs, New People-The Demographic Manifesto*, a Credit Suisse Research publication (2000) addressed to the most aging countries (e.g., Japan, Italy, Switzerland, Germany) and their policymakers. We argued there that countries ought to adopt a mix of four policies to deal with the demographics “time bomb”: flexible enabled working with abolition of mandatory retirement ages, increased female labour force participation with use of new technologies, selective migration and outsourcing/offshoring of non-core jobs. A very brief snapshot that indicates policy measures taken by aging countries includes measures to promote fertility (France), changes in retirement ages with pensioners re-engaging flexibly into the workforce (Japan), outsourcing and off-shoring (Germany and Japan), selective immigration (US, UK), encouraging women to better balance home and family life (tax benefits, crèches, etc., in Nordic countries and the Netherlands).

A holistic reform process across employment, pensions, health care, long-term care, education and training as well as migration is needed. It is a tough ask for governments that have the short-term view, but we believe the alternative of fiscal bankruptcy and downgrades is far worse.

## Conclusions

We believe that investors and markets should pay close attention to the aging-related fiscal imbalances and they should over time be reflected along different parts of the sovereign spread structure and sovereign yield curve. The fiscal obligations of sovereigns have implications for the short term, the medium term as well as the long term and therefore policy-makers as well as leaders should pay greater attention to them. This will warrant renegotiating past promises in the interests of fiscal prudence as well as inter-generational equity. These fiscal risks would influence economic growth, currency values and equity markets too. Lastly, individuals will need to increase their personal understanding and plan appropriately for a longer and more costly post-retirement span.

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## Disclosure Appendix

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