The Stockholm Agenda: A Welfare Perspective

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With population aging fiscal budgets in the European Union will come under significant strain. To tackle this problem, the Stockholm Agenda prescribes increasing employment rates, accelerating fiscal consolidation, and furthering entitlement reform. Using a generational accounting model with a detailed welfare analysis, this paper assesses this three-pronged strategy. It finds that, to enhance welfare, fiscal adjustment strategies need to be country-specific, taking into account differences in preferences, technology, and the state of public finances. A three-pronged strategy does not appear well-suited for these countries, but increasing labor utilization through higher employment rates is central.

I. INTRODUCTION

In Europe, as in all OECD countries, the population is progressively aging. The baby boom that appeared shortly after World War II is approaching retirement, fertility rates have fallen short of the replacement rate, and life expectancy is at an all-time high. As a result, in the near future, fewer and fewer adults of working age will be around to support a growing number of elderly people. To keep public finances on a sustainable path and to ensure ever-improving living standards for everyone, this change in the age structure will require significant fiscal adjustment. It is widely recognized (see Kotlikoff 2004, for

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example) that, by postponing action, more painful and more abrupt adjustment becomes inevitable.

On March 22 and 23, 2001 the European Council held its Spring meeting in Stockholm. There, a three-pronged strategy was outlined for Europe to address the budgetary challenges of its aging population. The essence of what is now dubbed the Stockholm Agenda is in paragraph 47 of the Council's conclusions (see European Council 2001), which reads:

> *"Higher employment rates must be promoted, especially for women and older workers. Ambitious policies to reduce the debt burden at a faster pace should be pursued to ensure fiscal sustainability. Public pensions, health care and programmes providing care for the elderly should be reviewed and, when necessary, reformed by Member States, while upholding inter-generational solidarity."*

Supporters of this plan argue that greater labor utilization widens the tax base, and that accelerating the pace of public debt reduction allows for a reallocation of public spending from servicing the debt to financing social expenditure. At first sight, this seems like a sensible and obvious solution—get everyone to work a little more to slow the increase in the ratio of beneficiaries to contributors, and improve the government's net asset position to give it more room to run larger primary deficits without undermining fiscal sustainability.

But the three-pronged strategy has its drawbacks. Even though people earn labor income, there is a disutility to working; higher public pensions also accrue, increasing the desire to consume (including leisure). With respect to the debt reduction strategy, it is crucial to know how the necessary budget surpluses will come about. Will they be tax based, and if so which tax margins will be affected? Or will they be expenditure based? To the extent that people value public consumption, for example, welfare may be affected. Current generations, whether inactive or still working, and future generations might not even agree on which is the best adjustment.

This paper argues that, when considering alternative policies to address the budgetary challenge of an aging population, policymakers should adopt a welfare perspective instead of a purely fiscalist point of view. Two fiscally-equivalent adjustments can have quite different effects on the well-being of different generations, depending on the choice

of margins (or instruments), as well as the magnitude and timing of adjustment. On their own, generational accounting exercises typically do not offer the policymaker insight as to which of the alternative policies should in fact be taken.[1] Using an accounting model to evaluate alternative policy strategies, this paper integrates a cross-country generational accounting exercise with an explicit welfare analysis for 13 European Union (EU) countries.

A word of caution is in order. Given that the model used is of an accounting nature and admittedly suffers from a few limitations, the simulation results should be interpreted not as specific targets, but as illustrative. The point of the paper is that countries should design the fiscal adjustment strategy that makes their public finances sustainable in a way that is best suited to their individual circumstances.

The plan of the paper is as follows. Section II presents the accounting framework, and Section III is dedicated to data and parameterization issues. Section IV discusses the design of the simulations, and Section V provides a cursory analysis of the results. Section VI concludes by recapping and highlighting a few caveats of the analysis.

II. THE FRAMEWORK

The accounting model replicates the data for 2002, the base year. All variables are expressed in real terms in 2002 prices, and will be written in lowercase roman letters.

With β as the subjective discount factor (equal to the inverse of the gross subjective discount rate) and $\rho_{a,b+a}$ as the probability of surviving until age a, having been born in year b, an agent's expected lifetime utility is:

$$U_b = \sum_{a=0}^{100} \beta^a \rho_{a,b+a} u_{a,b+a} \,. \tag{1.1}$$

The assumption is that agents' maximum lifespans are 100 years.

[1] These exercises often only provide a measure of the implicit public liabilities along with an array of alternative policies that would be sufficient to close the fiscal gap and even out generational burdens. Comparative welfare analyses, in turn, are typically carried out in the context of a general equilibrium model which does not have as many public finance details as a generational accounting model.

Having been born in year b, in year $t = b + a$ this agent is a years old and her instantaneous utility is of the constant returns to scale (CRS) Cobb-Douglas form:

$$u_{a,t} = \left(\bar{h} - h_{a,t}\right)^{\varepsilon} \left(\text{Broad consumption}_{a,t}\right)^{1-\varepsilon}. \tag{1.2}$$

In year t, she derives utility from a composite of the average number of hours of leisure that her birth cohort enjoys, $(\bar{h} - h_{a,t})$, and broad consumption. Broad consumption is a CRS Cobb-Douglas composite of private consumption and public spending in kind:

$$\text{Broad consumption}_{a,t} = \left(c_{a,t}\right)^{\alpha} \left(e_{a,t}^{\nu_e} \cdot s_{a,t}^{\nu_s} \cdot (\mu g_t)^{1-\nu_e-\nu_s}\right)^{1-\alpha}. \tag{1.3}$$

Public spending in kind enters agents' utility through provision of per capita publicly-provided education, $e_{a,t}$, per capita publicly-provided health care, $s_{a,t}$, and per capita public consumption and general government subsidies, bundled into g_t. This is assumed as non-age specific, and only a proportion $0 \le \mu \le 1$ of which is valued by the agent.[2] Note that the specification for this bundle allows $e_{a,t}$, $s_{a,t}$, and g_t in effective units, μg_t, to be valued differently.

Written in logs, instantaneous utility is:

$$u_{a,t} = \varepsilon \ln(\bar{h} - h_{a,t}) + (1-\varepsilon)\left[\alpha \ln c_{a,t} + (1-\alpha)\left(\nu_e \ln e_{a,t} + \nu_s \ln s_{a,t} + (1-\nu_e-\nu_s)\ln(\mu g_t)\right)\right].$$

As is standard practice in generational accounting exercises (see, for example, Oreopoulos and Kotlikoff 1996, for a comprehensive tutorial), per capita publicly-provided education and health care are projected according to:

$$e_{a,t} = e_{a,2002}(1+\gamma)^{t-2002}\lambda_t^e \tag{1.4}$$

and

$$s_{a,t} = s_{a,2002}(1+\gamma)^{t-2002}\lambda_t^s, \tag{1.5}$$

[2] General government subsidies are actually a source of income for households. Given that these are typically not very significant, classifying them as public spending in kind will not alter much the results.

where $e_{a,2002}$ and $s_{a,2002}$ are the respective age profiles of public spending in kind, pertaining to the base year, and γ is the annual growth of labor productivity. The rationale is that, because these services are labor-intensive, the wage costs dominate and these tend to follow productivity.

Per capita public consumption and government subsidies are modeled as non-age specific and grow with per capita GDP:

(1.6) $$g_t = g_{2002}\left(1+\gamma^{GDPpc}\right)^{t-2002}\lambda_t^G$$

In the absence of fiscal consolidation efforts where $\lambda_t^G < 1$, aggregate public consumption and government subsidies will be constant as a percent of GDP.

Per capita general government gross fixed capital formation is similarly projected:

(1.7) $$inv_t = inv_{2002}\left(1+\gamma^{GDPpc}\right)^{t-2002}\lambda_t^G .$$

This assumes that public investment activities are not utility-enhancing,.

Disposable income is computed as:

(1.8) $$y_{a,t}^d = nli_{a,t} + nci_{a,t} + tr_{a,t} - t_{a,t}^C - t_t^{LS},$$

and is the sum of net labor income, net capital income, and social protection transfers, minus consumption taxes and non-age-specific general government revenues, t_t^{LS}, which are assumed to grow with GDP per capita:

(1.9) $$t_t^{LS} = t_{2002}^{LS}(1+\gamma^{GDPpc})^{t-2002},$$

so that, on aggregate, these lump sum taxes stay constant as a percent of GDP.

Net labor income is age specific and determined according to:

(1.10) $$nli_{a,t} = (1-\tau_{2002}^L\lambda_t^L)w_{a,2002}^{TCPH}(1+\gamma)^{t-2002}\eta_{a,2002}\lambda_{a,t}^{\eta}h_{2002}\lambda_t^h,$$

where τ^{L}_{2002} is the implicit tax on labor income in 2002, λ^{L}_{t} is a policy lever acting upon this tax margin, and $w^{TCPH}_{a,2002}$ is the total cost to an employer of hiring one hour of labor from someone aged a in 2002. This total cost is the average gross hourly wage along with the social security contributions paid by the employer, and is assumed to grow with labor productivity, at the annual rate of γ. Also, changes in labor taxes do not alter the total cost of hiring, but simply reduce net labor income for workers, who thus bear the entire economic incidence.

In this analysis, labor demand is assumed to be perfectly elastic in the long run as other factors of production can easily be substituted and the long-run elasticity of labor supply *at the household level* is assumed to be zero. According to Kimball and Shapiro (2003) this is a regularity observed across households, countries, and time that can be explained by the canceling out of the income and substitution effects of a permanently higher real wage. In such a framework, changes in labor taxes and in social security contributions have no permanent effect on labor utilization. They do, however, have a fiscal impact both directly and indirectly, through consumption taxes, as the household's income is affected.

Note that the average number of hours worked by the cohort aged a in year t, $h_{a,t}$, is determined by the corresponding employment rate, $\eta_{a,t} = \eta_{2002}\lambda^{\eta}_{a,t}$, times $h_t = h_{2002}\lambda^{h}_{t}$, the total number of hours worked in year t by every employee. The lambdas here are policy levers on the age-group-specific employment rate ($\lambda^{\eta}_{a,t}$) and the total number of hours worked (λ^{h}_{t}). These levers reflect the impact of structural reforms that raise labor utilization by shifting the vertical labor supply schedule outwards. Such supply-side structural reforms increase both take-home pay and labor income tax revenues.

Per capita labor income taxes, at 2002 prices, include employees' and employers' social security contributions as well as personal income taxes, and are age specific according to:

$$t^{L}_{a,t} = \tau^{L}_{2002}\lambda^{L}_{t} w^{TCPH}_{a,2002}(1+\gamma)^{t-2002}\eta_{a,2002}\lambda^{\eta}_{a,t}h_{2002}\lambda^{h}_{t}\,. \tag{1.11}$$

Because λ^{L}_{t}, $\lambda^{\eta}_{a,t}$, and λ^{h}_{t} enter multiplicatively in (1.11), from a strictly fiscal perspective, it does not matter which (combination of the) three margins are (is) used in a policy adjustment. However, authorities should *not* be indifferent as each alternative will

have a different impact on the welfare of each birth cohort. Finally, note that the total cost to an employer of hiring one hour of labor from someone aged a in 2002 is determined as

$$w^{TCPH}_{a,2002} = \frac{t^{L}_{a,2002}}{\tau^{L}_{2002}\eta_{a,2002}h_{2002}}. \tag{1.12}$$

Net capital income is also age specific and is computed as:

$$nci_{a,t} = \frac{1-\tau^{K}_{2002}}{\tau^{K}_{2002}} t^{K}_{a,2002}(1+\gamma^{K}_{t})^{t-2002}, \tag{1.13}$$

which is immediate, after knowing that $t^{K}_{a,2002} = \tau^{K}_{2002} \cdot \text{Gross capital income}_{a,2002}$, that $nci_{a,2002} = (1-\tau^{K}_{2002}) \cdot \text{Gross capital income}_{a,2002}$, and that $t^{K}_{a,t} = t^{K}_{a,t-1}(1+\gamma^{K}_{t})$. As the capital share in GDP is held constant over time, aggregate gross capital income must grow with GDP, so:

$$1+\gamma^{K}_{t} = \frac{\sum_{a} P_{a,t-1}t^{K}_{a,t-1}}{\sum_{a} P_{a,t}t^{K}_{a,t-1}}\left(1+\gamma^{GDP}_{t}\right), \tag{1.14}$$

where $P_{a,t}$ corresponds to the population aged a in year t.

Social protection transfers, in real terms, are simply modeled as:

$$tr_{a,t} = \lambda^{TR}_{t} tr_{a,2002}. \tag{1.15}$$

Choosing such a specification circumvents the need to model the reforms to social protection systems that some EU countries have already launched. Many of these reforms involve complex changes that are scheduled to kick in some decades in the future. For the purposes of evaluating the Stockholm Agenda, however, this analysis needs only to determine where countries should be in the future if they are to achieve sustainable public finances. It is up to each country individually to ascertain the extent to which the already-legislated reforms are sufficient. In short, conditional on the choice of policy

levers and the speed of adjustment that is imposed, a path of maximum social protection transfers that is still affordable can be determined.

Private consumption is determined as an age specific fraction of permanent income according to:

$$c_{a,t} = \theta_{a,2002} \sum_{i=0}^{100-a} (1+r)^{-i} y^{d}_{a+i,t+i}, \tag{1.16}$$

where $1+r$ is the time-invariant gross market discount rate that applies to households.

Consumption taxes, at an implicit rate of $\tau^{C}_{2002}\lambda^{C}_{t}$, create a wedge between consumption volume, $c_{a,t}$, and real private consumption expenditure, gross of all consumption taxes, $cons_{a,t}$. That is:

$$c_{a,t} = \left(1-\tau^{C}_{2002}\lambda^{C}_{t}\right) cons_{a,t} \tag{1.17}$$

and

$$t^{C}_{a,t} = \tau^{C}_{2002}\lambda^{C}_{t} cons_{a,t} \ . \tag{1.18}$$

For unchanged expenditure, $cons_{a,t}$, an increase in consumption taxes ($\lambda^{C}_{t} > 1$) will lower consumption volume.

Using a backward induction argument, with $y_{a,t} = nli_{a,t} + nci_{a,t} + tr_{a,t} - t^{LS}_{t}$, real private consumption expenditure, gross of all consumption taxes, is determined as:

$$cons_{a,t} = \frac{\theta_{a,2002}}{1+\tau^{C}_{2002}\lambda^{C}_{t}\left(\theta_{a,2002}-1\right)}\left[y_{a,t} + \sum_{i=1}^{100-a}\left(\frac{y_{a+i,t+i} - \tau^{C}_{2002}\lambda^{C}_{t+i} cons_{a+i,t+i}}{(1+r)^{i}} \right)\right], \tag{1.19}$$

and the age-specific coefficient is computed as:

$$\theta_{a,2002} = \frac{\left(1-\tau^{C}_{2002}\right)t^{C}_{a,2002}}{\tau^{C}_{2002}}\left(\sum_{i=0}^{100-a} \frac{y_{a+i,2002+i} - t^{C}_{a+i,2002+i}}{(1+r)^{i}} \right)^{-1} . \tag{1.20}$$

Real growth of GDP, γ_t^{GDP}, is obtained by adding γ_t^H, the growth in the aggregate number of hours worked in a year, to γ, labor productivity growth.

To ensure a constant labor share in GDP:

$$\gamma_t^H = \frac{\sum_a h_{a,t} P_{a,t} w_{a,t-1}^{TCPH}}{\sum_a h_{a,t-1} P_{a,t-1} w_{a,t-1}^{TCPH}} - 1. \tag{1.21}$$

The general government's intertemporal budget constraint evaluated in 2002 is

$$\sum_{t=2002}^{2150} \left(1+r^{PS}\right)^{t-2002} \sum_{a=0}^{100} P_{a,t} \left(t_{a,t}^L + t_{a,t}^K + t_{a,t}^C + t_t^{LS} - tr_{a,t} - e_{a,t} - s_{a,t} - g_t - inv_t\right) = d_{2002} \tag{1.22}$$

which states that the present value of aggregate taxes net of aggregate primary public expenditures must be sufficient to pay off the stock of aggregate net debt. The discount rate is r^{PS}, and it typically differs from r which applies to households. When the right hand side of (1.22) is larger than the left hand side, public finances are not on a sustainable footing, and the difference is the fiscal gap. To allow cross-country comparability, this measure is usually expressed as a percent of base year GDP.

The public debt-to-GDP ratio, written in nominal terms is computed according to:

$$\frac{D_t}{Y_t} = \frac{1+i}{1+\gamma_t^{\text{Nominal GDP}}} \frac{D_{t-1}}{Y_{t-1}} - \frac{\text{Primary balance}_t}{Y_t}, \tag{1.23}$$

where *i* is the nominal interest rate, and $\gamma^{\text{Nominal GDP}}$ is the growth rate of nominal GDP.

The general government's overall fiscal balance is:

$$\frac{\text{Balance}_t}{Y_t} = \frac{\text{Primary balance}_t}{Y_t} - \frac{i}{1+\gamma_t^{\text{Nominal GDP}}} \frac{D_{t-1}}{Y_{t-1}}. \tag{1.24}$$

This accounting framework is sufficient for a preliminary evaluation of the Stockholm Agenda. For each prong, the following are the policy levers:

- *Further entitlement reform.* The evolution of social protection transfers can be moderated by acting upon λ^{TR};

- *Increasing labor utilization.* Employment rates for mature and for older workers aged 25-54 and 55-64, respectively, can be raised by acting upon λ_a^{η}, and the annual number of hours worked by every employee can be increased through λ^{h};

- *Accelerating fiscal consolidation*. Budgetary surpluses can be achieved either by raising consumption taxes (acting on the λ^{C} lever), by increasing labor income taxes (using the λ^{L} lever), or through retrenchment (using λ^{G}, λ^{e} and λ^{s}). In the latter case public investment, general government subsidies, and public consumption are all equally reduced, but cuts in education and health care are half and a third of this adjustment, respectively. This assumption reflects the reality that electorates, especially in Europe, are often more strongly opposed to such budget cuts.

III. DATA AND PARAMETERS

This section describes the data and sources used and discusses how the parameters were set. A complete data set is available for all EU countries with the exception of Greece, Luxembourg, and the ten new members.

Key demographic information including age-, gender- and year-specific mortality rates, as well as projections for the number of people, are obtained from the Eurostat's New Cronos database. This data comes from the 1995 and the 1999 central population variants provided by Eurostat. The projections go until 2050; from then on an invariant age structure is assumed.

Fiscal data for the general government by economic function, is presented in Table 1 and is also taken from the New Cronos database. The OECD Economic Outlook database (see OECD 2004a) was used for data on GDP, net debt, and net interest payments.[3] General

[3] Gross debt and interest payments were used when the corresponding numbers in net terms were unavailable.

government gross fixed capital formation comes from the European Commission's AMECO database.

Table 2 presents more microeconomic data for the thirteen countries under analysis. Estimates of implicit tax rates on labor income, capital income, and consumption are taken from Eurostat (2004). Average annual hours worked per person in employment are tabled in the Statistical Annex of the OECD's Employment Outlook (see OECD 2004b). Employment rates for three age groups—15 to 24, 25 to 54, and 55 to 64 years old—are available from Eurostat's New Cronos database. The growth of labor productivity is the decade average from 1991 to 2001, and derives from the OECD Economic Outlook database (see OECD 2004a).

Afonso, Schuknecht, and Tanzi (2003, Table 1) provide estimates of the administrative performance of the public sector, as a composite of indicators taken from various World Competitiveness Reports. This index covers bribery and corruption, bureaucracy (basically red tape), confidence in the administration of justice, and the size of the shadow economy. These estimates are used to set the quality of public consumption or μ which is the fraction of public consumption and general government subsidies that is utility-enhancing for agents.

Finally, the age and gender profiles of public revenues and public expenditures are based on European Commission (1999), a previous generational accounting study, and on Auerbach, Kotlikoff, and Leibfritz (1999) for Portugal.

Turning to parameterization issues, the upper bound on the number of hours worked a year, $\bar{h}$, is set at 10 hours/day x 6 days/week x (52 - 4) weeks a year, totaling 2880 hours a year. The Cobb-Douglas utility specification allows for a parameterization where the budget shares equal the exponents. Using this approach, the preference parameters for private consumption (α), publicly-provided education (v_e), and publicly-provided health care (v_s) were set using the shares of these expenditure items in GDP. With respect to calibrating ε, which determines how an agent allocates income between leisure and broad consumption, a full income concept is used—defined as broad consumption plus the market value of leisure enjoyed. The market value of leisure in the base year is computed as:

$$(1.25) \qquad mvl_{2002} = \sum_{a=0}^{100} P_{a,2002}(\bar{h} - h_{a,2002}) w_{a,2002}^{TCPH}(1-\tau_{2002}^{L}).$$

Given the Cobb-Douglas specification, ε is the corresponding budget share determined by the ratio between the market value of leisure and full income.

James (1994) uses a pure rate of time preference of 3 percent a year, which is the value chosen for the subjective discount rate. The market discount rate that is relevant for the private sector is set at 8 percent, which is the value used by Black, Laxton, Rose, and Tetlow (1994). The discount rate for computing the fiscal gap is 5 percent, consistent with the analysis of the European Commission (1999). This discount rate may seem high but, as Cardarelli, Sefton and Kotlikoff (1999) explain, such a discount rate is justified by the riskiness of the expenditure and revenue flows (the degree to which future net taxes will be higher is itself uncertain) and by the difficulty governments have in credibly committing to run primary surpluses in the long run.

Finally, the nominal interest rate (i) used to compute both the public debt and overall balance-to-GDP ratios is set at 5.75 percent when the stock of public debt is positive. This was the average nominal interest rate implicit in the debt service in 2002 for Austria, Belgium, France, Germany, Greece, Italy, the Netherlands, Portugal, Spain, and the United Kingdom. When public debt is negative, it is assumed that the interest rate is 3 percent. This simply reflects the fact that accumulating assets is done conservatively and thus the interest rate earned is lower than interest rate due.

Table 1. Fiscal data as a percent of GDP, 2002

	AT	BE	DK	FI	FR	DE	IE	IT	NL	PT	ES	SE	UK
Revenues	50.9	50.5	57.4	54.4	50.2	45.0	33.1	45.6	45.9	43.4	39.9	58.1	40.0
Taxes on labor	23.4	25.4	26.7	24.2	22.8	24.4	10.2	20.2	19.2	15.1	16.8	31.6	14.0
Personal income taxes on labor	8.7	10.8	25.0	12.0	6.3	7.4	5.8	7.9	5.3	3.9	4.1	17.0	7.9
Social Security contributions	14.7	14.6	1.7	12.2	16.5	17.0	4.4	12.3	13.9	11.2	12.7	14.6	6.1
Taxes on capital	8.5	9.9	6.2	8.0	9.3	5.6	7.4	11.2	8.5	8.7	9.3	6.0	8.5
Taxes on consumption	12.6	11.3	15.9	13.7	12.1	10.1	11.1	10.3	11.7	12.5	10.0	13.0	13.4
Other taxes	6.4	3.9	8.6	8.5	6.0	4.9	4.4	3.9	6.5	7.1	3.8	7.5	4.1
Outlays	51.3	50.5	55.8	50.1	53.5	48.5	33.3	48.0	47.5	46.1	39.9	58.3	41.5
Social protection	21.6	17.8	24.5	21.3	20.6	22.4	9.3	18.2	17.9	14.0	13.4	24.1	15.7
Health care	6.7	6.7	5.6	6.3	8.4	6.4	6.4	6.5	4.5	6.9	5.3	7.1	6.4
Education	5.7	6.4	8.3	6.6	6.0	4.2	4.3	4.9	4.9	7.0	4.3	7.5	5.0
Net interest payments	2.8	5.8	1.6	0.2	2.8	2.7	0.1	5.3	2.4	3.0	2.5	0.9	1.5
Gross fixed capital formation	1.6	1.8	1.6	3.4	3.1	4.3	1.9	3.3	1.3	3.4	2.9	3.3	1.3
Subsidies and public consumption	13.0	12.1	14.2	12.3	12.6	8.5	11.3	9.8	16.6	11.8	11.5	15.5	11.6
Primary budgetary position	2.4	5.8	3.2	4.5	-0.5	-0.8	-0.1	2.9	0.8	0.3	2.5	0.7	0.0
Net lending	-0.4	0.0	1.6	4.3	-3.3	-3.5	-0.2	-2.4	-1.6	-2.7	0.0	-0.2	-1.5
Net debt	45.0	98.4	7.6	-32.3	39.4	48.5	32.3	94.0	41.9	58.1	39.9	4.8	32.0

Source: Eurostat and OECD

Table 2. Other data and parameters, 2002

	AT	BE	DK	FI	FR	DE	IE	IT	NL	PT	ES	SE	UK
Implicit tax rate													
… on capital income (Tau_K)	28.5	30.3	28.8	30.3	36.6	20.9	29.3	28.1	29.6	31.7	29.6	31.5	30.8
… on labor income (Tau_L)	39.2	43.5	39.9	43.9	41.8	39.9	25.9	41.1	31.9	33.7	30.0	46.6	24.6
… on consumption (Tau_C)	22.0	21.7	33.7	28.0	17.4	18.3	25.8	17.1	24.2	20.1	16.3	30.6	21.3
Average annual hours actually worked per person in employment	1567	1547	1462	1686	1459	1443	1666	1599	1338	1697	1664	1581	1692
Employment rate													
… of young workers (Eta_15-24)	51.6	29.4	63.5	40.7	29.9	45.4	49.7	25.8	70.0	42.1	33.0	42.8	56.3
… of mature workers (Eta_25-54)	83.9	76.5	84.1	81.6	79.5	78.8	76.0	70.1	82.8	81.6	70.1	84.1	80.6
… of older workers (Eta_55-64)	29.7	26.6	57.9	47.8	34.7	38.8	47.1	28.9	42.3	50.9	39.7	68.0	53.5
Labor productivity growth, 1991-2001 average (Gamma)	1.81	1.30	2.05	2.68	1.21	1.38	3.37	1.53	1.17	1.71	1.19	2.53	2.13
Preference for													
… leisure (Epsilon)	44	49	44	35	40	47	41	44	52	29	45	39	38
… private consumption (Alpha)	68	66	61	63	70	70	64	71	64	68	72	56	72
… publicly provided education (v_e)	21	24	28	23	20	18	18	20	18	24	18	22	21
… publicly provided health care (v_s)	25	25	19	22	28	27	27	27	17	24	22	21	26
Quality of public consumption (Mu)	96.0	57.9	92.1	100.0	57.1	81.0	84.1	41.3	92.1	42.9	61.1	92.1	79.4

Source: Eurostat; OECD; Ministerio de Trabajo y Asuntos Sociales (2002); Afonso, Schuknecht and Tanzi (2003); and author's calculations

IV. On the Design of the Simulations

A strict interpretation of the Stockholm Agenda is that it prescribes a three-pronged adjustment recipe that every EU member should follow. A looser reading is that countries are free to choose from among the various ingredients: increased labor utilization, accelerated fiscal consolidation, and further entitlement reform. This research adopts a welfare perspective on the Stockholm Agenda to determine whether the reforms to eliminate the fiscal gap should be country-specific (and if so, how would they differ) or if, a common adjustment recipe should be prescribed. This section explains the logic behind the simulations that are specifically designed to answer this question.

The starting point is a reference scenario that is the default adjustment strategy with respect to which alternative policy scenarios can be judged. It should be noted that in all countries the status quo cannot be the reference scenario because it is fiscally unsustainable over the long run. Instead, the reference scenario assumes countries close their fiscal gaps using just lump sum taxes. These taxes impose an equal burden on all those alive at a given point in time. In every case, including the reference scenario, the adjustment goes from 2006 to 2015. A short horizon is warranted on the grounds that if the necessary action is postponed and or if a longer period is assumed, then the measures will have to be more rigorous, making the adjustment even more painful.

Conducting a welfare ranking of the alternative policies requires a discussion of the welfare criterion used. For the cohorts born in or after the base year, 2002, the criterion is expected lifetime utility, as in equation (1.1). For the cohorts born before that date, the standard becomes *remaining* expected lifetime utility, from their present age to 100.[4] As such, using the reference scenario as the baseline, the welfare criterion will be percentage deviations in (remaining) expected lifetime utility, (RELU). In particular, five birth cohorts are considered: 1916, 1946, 1976, 2006 and 2036, one generation apart. These roughly represent grandparents, parents, children and grandchildren of a young adult today.

[4] Without this assumption, information on all the public services, taxes paid, incomes received and goods and services consumed since birth would be required, which is clearly not available as the oldest cohort was born in 1902.

Table 3. List of cases considered to close the fiscal gap

Case	Adjustment from 2006 to 2015 through …
Case 0	Lump sum taxes (reference scenario)
Case 1	Labor taxes and social security contributions
Case 2	Consumption taxes
Case 3	Public consumption, general government subsidies, public investment, education (1/2x), and health care (1/3x)
Case 4	Social protection transfers
Case 5	Employment rates of workers aged 25-54 and 55-64 (3x)
Case 6	Aggregate hours worked per year
Case 7	A spending-based Stockholm Agenda (equal combination of Cases 3, 4 and 5)
Case 8	A tax-based Stockholm Agenda (equal combination of Cases 2, 4 and 5)
Case 9	A country-specific welfare-enhanced Stockholm Agenda

Table 3 describes the scenarios. Case 0 is the reference scenario where lump sum taxes are used to close the fiscal gap by 2015. Cases 1 through 6 assume that all of the necessary adjustment is carried out using a single margin. Unrealistic as these cases are individually, they are building blocks of the Stockholm Agenda. Cases 1, 2 and 3 pursue the accelerated fiscal consolidation path, through higher labor taxes and social security contributions, higher consumption taxes, and cutbacks in public consumption (CG), general government subsidies, and public investment (bundled into CG) as well as in publicly provided education (Ed) and in health care (He). As noted earlier, adjustments in CG are three times larger than in He, and twice as large as in Ed. Case 4 involves reducing social protection transfers over the next ten years. Cases 5 and 6 focus on increasing labor utilization, through higher employment rates (the extensive margin) and through a greater number of aggregate hours worked in a year (the intensive margin). As a rule, adjustments in the employment rates of workers aged 55 to 64 are three times

larger that those pertaining to workers aged 25 to 54. It is widely acknowledged that participation rates amongst older workers are low in Europe, while those pertaining to prime-age males are not especially so. Female participation rates can still be boosted, though.

Finally, Cases 7, 8 and 9 are three variants of the Stockholm Agenda. Cases 7 and 8 are strategies that prescribe the use of all three prongs and that differ in the way that the accelerated fiscal consolidation is to be pursued, based on either retrenchment efforts or higher consumption taxes. In each case, the three prongs are accorded equal weight in the fiscal adjustment. Case 9 offers a looser interpretation of the Stockholm strategy in that country-specific agendas for fiscal adjustment are allowed. Here, some prongs are included while others are left out. In this context, subject to a few rules of consistency, the best combination is the one that yields the greatest sum of percentage deviations in remaining expected lifetime utility (RELU) across the 1916, 1946, 1976, 2006 and 2036 birth cohorts.

With respect to the rules of consistency that are imposed, policy instruments have limits with respect to the extent of their use. In the case of employment rates, according to two recent OECD studies, the upper limits are appreciably below 100 percent. Duval (2003) asks how much participation rates for older workers (aged between 55 and 64) would increase if the implicit taxes on working at older ages were fully eliminated. Distortions in pension and social transfer programs (like disability, unemployment, and early retirement) act like an implicit tax on those that keep working. Increases in the participation rate are equated with increases in the corresponding employment rate, in light of the positive correlation between these rates for all workers aged 55-64.[5] In a similar study that focuses on prime-age females, Jaumotte (2003) asks by how much the labor participation rate for females aged 25 to 54 would increase if certain policy reforms were enacted. She finds that in countries where second earners in married couples (typically women) are taxed more heavily than single individuals, or where public childcare support is lacking, women feel more discouraged from participating in the labor market.

Consistency also requires that there be no conflict between the policy instruments and objectives chosen to carry out the fiscal adjustment. For example, a strategy that aims to

[5] See data from the OECD Labor Force Statistics cross-plotted as Figure 7 in Elmeskov (2004).

improve labor utilization and that prescribes an increase in the "tax wedge"—e.g., through higher labor taxes or through higher social security contributions—makes little economic sense.

V. Discussion of the Results

Projections of age-related public spending as a percent of GDP are often used to assess the readiness of countries' public finances to cope with the forthcoming aging of the population. At least for some countries, this analysis can be misleading given that computing the fiscal gap requires information on all budgetary items, not just those that are sensitive to aging. In some cases, the behavior of tax revenues and of non age-related spending will offset a large burden that is due to population aging. In short, the fiscal gap as a percentage of base year GDP is a better indicator because it is more comprehensive.

Tables 4 and 5 provide simulation results for these two summary indicators. Note that the projections of social protection transfers and health care simply filter the demographics through the age profiles for 2002. As such, no reforms have been modeled, not even those that in 2002 were already planned to kick in at some time in the future. These numbers are simply estimates of where countries would be without the further reforms that may already have been legislated. Thus, without further entitlement reform, Italy, Austria, Spain and Finland are expected to register the largest budgetary burden from aging, whereas Ireland, Sweden, the Netherlands and the United Kingdom would be at the opposite end of the spectrum. Table 5, which, displays estimates of the fiscal gap as a percent of GDP in 2002 gives a different ranking. With a discount rate of 5 percent, the worst cases are Italy and Germany, with estimated fiscal gaps of 240 and 224.8 percent of GDP, respectively. At the lower end of the spectrum, are Spain (51.3 percent of GDP), Belgium (54.9 of GDP), Denmark (69.1 of GDP) and Sweden (73.1 of GDP). The differences between the rankings can be explained by the fact that non age-related budgetary items help to offset the aging burden in Austria, Belgium, Denmark, Finland, and Spain.

Table 4. Projections of social protection transfers (TR) and health care (He), percent of GDP

	2005	2025	2050	Variation in p.p.
Austria	28.8	36.7	45.9	17.1
Belgium	24.8	31.3	34.8	10.0
Denmark	30.8	37.5	40.2	9.4
Finland	28.7	38.0	40.8	12.1
France	29.1	34.6	38.6	9.5
Germany	22.9	29.0	33.4	10.5
Ireland	9.2	10.5	13.0	3.8
Italy	18.9	26.9	38.0	19.1
Netherlands	18.0	22.3	24.4	6.4
Portugal	20.9	24.4	29.8	8.9
Spain	18.5	22.2	31.5	13.0
Sweden	24.1	27.0	29.3	5.2
United Kingdom	22.1	25.8	29.7	7.6

Note: These projections point to where Member States will be without reforms that may already have been legislated

Table 5. Fiscal gap as a percentage of GDP in 2002, under different discount rates

	$r^{PS} = 4\%$	$r^{PS} = 5\%$	$r^{PS} = 6\%$
Austria	273.5	172.6	118.9
Belgium	63.4	54.9	51.4
Denmark	115.0	69.1	44.2
Finland	173.8	78.1	28.8
France	169.9	132.0	107.4
Germany	313.9	224.8	173.5
Ireland	153.2	125.6	97.5
Italy	340.1	240.0	184.5
Netherlands	125.5	101.9	85.4
Portugal	181.0	136.0	109.2
Spain	76.0	51.3	38.0
Sweden	117.7	73.1	49.3
United Kingdom	96.2	79.8	66.7

Next, the simulation results for the 13 European countries are considered. These results are summarized in Tables A.1 through A.14 in the annex. The focus is on the welfare impact of the different cases studied for the five birth cohorts. Notwithstanding the cross-

country differences that exist regarding preferences for leisure, public consumption and private consumption, some common patterns stand out.

First, fiscal adjustments through labor income taxes and social security contributions (Case 1) are preferred to adjusting through consumption taxes (Case 2). For older generations this is not surprising, given that they have stopped working but still consume. For younger generations, it is due to discounting—they only start working at around twenty but they consume over the entire course of their lifetimes.

A second observation is that older generations prefer fiscal adjustment through retrenchment (Case 3) rather than through lump sum taxes. This is because it allows them to benefit from higher pensions while everyone shares the burden of adjusting through lower public consumption, government subsidies, public investment, health care and education. In this scenario, there is a tension between older and younger generations: for most countries the younger generations (already alive or still to be born) are decidedly worse off under Case 3, and would prefer that all of the necessary adjustment be done solely through further entitlement reform (Case 4).

And third, the preferred strategy of adjustment tends to be increased labor utilization. This result holds for all 13 countries. In this case there does not seem to be any generational conflict. Older generations benefit through higher capital income which is a consequence of higher GDP. It is also the preferred alternative of younger generations, despite the loss of leisure time. Note though, that closing the fiscal gap through this margin often requires boosting labor utilization beyond the upper limits indicated by the OECD. Nonetheless, these simulation results suggest that carrying out reforms that aim to boost employment rates, in particular for female and older workers, should be a top priority.

A higher employment rate is modeled as if policymakers could directly influence it directly, which is obviously unrealistic. However, in the data there is a strong correlation between employment rates and labor participation rates, and the higher participation rates, for example, can be achieved through the policy actions highlighted by the two OECD studies, Jaumotte (2003) and Duval (2003). These policy actions—such as providing child care support, addressing the tax discrimination of second earners in married couples, or lowering the implicit taxes on working at older ages—correct distortions in the economy but inevitably entail a resource cost. These public finance

costs could vary depending on the measures involved, e.g., providing more child care support versus reducing unemployment benefits. By increasing employment manually, it is assumed that what is gained by correcting the distortions is just enough to cover the resource cost of the reforms. In reality, a net social benefit could be observed despite the fiscal cost.

Another interesting conclusion is that only for Portugal should adjusting through retrenchment be included in a fiscal consolidation process that is welfare-augmenting. For the remaining countries, such a strategy is hard to justify, in this framework at least, due to the welfare losses it entails.

Having simulated Cases 1 through 6, and getting an idea of the preferred margins of fiscal adjustment in each country, a country-specific welfare-enhanced Stockholm Agenda can be characterized. The key is to determine, through a comparative welfare analysis, whether a country-specific Stockholm strategy (Case 9) is better than a common agenda (Cases 7 and 8). Based on the analysis of this paper, Table 6 provides a summary matrix of which of the three prongs EU countries should focus on. In a very practical sense, this exercise is a first step in making the Stockholm Agenda operational. A few interesting conclusions emerge from the table. First, improving labor utilization is overwhelmingly important and for most countries this should be obtained through the extensive margin, i.e., by increasing employment rates. In 10 countries employment rates should be raised to meet the OECD upper limits. Second, in 10 of the 13 countries, more than one margin of fiscal adjustment is required; most require higher employment rates alongside entitlement reform. This is especially true for countries with more acute long-term fiscal imbalances. Especially in the case of the employment rates of older workers, these two policies reinforce each other. Retrenchment is advisable as a part of the fiscal adjustment strategy only in Portugal. In no country is a Stockholm Agenda-like strategy that features all three prongs recommended. Also, fiscal consolidation seems to be better achieved on the expenditure side than on the revenue side; consumption taxes, in particular, are very penalizing.

But are country-specific adjustment strategies really worth the trouble? Table 7 presents a comparative analysis of the welfare impact for the five birth cohorts considered. The conclusion is that, on average, the sum of percentage deviations in remaining expected lifetime utility across the five birth cohorts is almost three times as large when a country-specific adjustment strategy is pursued. This is a significant difference and should prompt

countries to tailor the Stockholm Agenda's prescription to their specific environment. If the country-specific scenario—which is, by construction, the one which yields the greatest sum of percentage deviations from remaining expected lifetime utility—excludes a certain margin of adjustment then that particular instrument should not be used. In that case, a Stockholm Agenda (like Cases 7 and 8) that prescribes a common-to-all adjustment strategy is comparatively worse from a welfare perspective.

Table 7 also allows for an analysis of which of the three cases (7, 8 and 9) the five birth cohorts would choose, if surveyed. In nine of the 13 countries, the country-specific welfare enhanced strategy would win out against Cases 7 and 8. In Germany and in Italy the older birth cohorts (1916 and 1946) would block Case 9 in favor of Case 8, the common-to-all strategy where fiscal consolidation is achieved through higher consumption taxes. In Sweden and in the United Kingdom, the opposition to Case 9 would be weaker given that only the 1916 cohort would oppose, and even so it would be by a narrow margin. On the whole, these figures are reassuring in the sense that they suggest that implementing a country-specific welfare-enhanced strategy does not necessarily entail a generational conflict. Only in Germany and in Italy does such a conflict appear to exist, probably due to the scale of the adjustment that is required. If so, this would suggest that the longer countries wait before they start their much-needed fiscal adjustment programs the more their fiscal imbalances worsen and, as such, a generational conflict becomes ever more likely.

Table 6. Towards a welfare-enhanced Stockholm Agenda - a summary matrix of which adjustment margins to use to eliminate the fiscal gap

	Greater labor utilization			*Entitlement reform*	*Fiscal consolidation*	
	Aggregate hours worked (H)	Employment rates (Eta_25-54 ; Eta_55-64) 1/		Social protection transfers (TR)	Consumption taxes (Tau_C)	Public consumption, health care and education (CG, He, Ed) 2/
Austria		XX	XX	X		
Belgium		XX	X			
Denmark	X /3	XX	XX	X		
Finland		XX	X			
France		XX	XX	X		
Germany		XX	XX	X		
Ireland		XX	XX	X		
Italy		XX	XX	X		
Netherlands		XX	XX	X		
Portugal		XX	XX			X
Spain		X	X			
Sweden		XX	XX	X		
United Kingdom		XX	XX	X		

1/ XX means that the OECD upper limits for employment rates are to be met.

2/ Health care and education adjust respectively 1/3 and 1/2 of what public consumption, general government subsidies and public investment adjust.

3/ Alternative policy.

Table 7. A common strategy or a country-specific one: a comparative welfare analysis

Country	Strategy	Sum of % deviations in RELU	Welfare impact by birth cohort				
			1916	1946	1976	2006	2036
Austria	Case 7	0.41	0.06	0.06	-0.01	0.15	0.15
	Case 8	0.50	0.07	0.10	0.01	0.17	0.15
	Country-specific	1.24	0.07	0.20	0.17	0.39	0.41
Belgium	Case 7	0.11	0.02	0.02	-0.01	0.04	0.04
	Case 8	0.15	0.02	0.03	0.00	0.05	0.05
	Country-specific	0.46	0.05	0.11	0.04	0.12	0.14
Denmark	Case 7	0.02	0.01	0.01	-0.02	0.01	0.01
	Case 8	0.09	0.01	0.02	0.00	0.03	0.03
	Country-specific	0.38	0.04	0.09	0.04	0.10	0.11
Finland	Case 7	0.13	0.05	0.01	-0.01	0.04	0.04
	Case 8	0.18	0.05	0.04	0.02	0.04	0.03
	Country-specific	0.83	0.11	0.18	0.12	0.20	0.22
France	Case 7	0.85	0.07	0.10	0.08	0.29	0.31
	Case 8	0.70	0.07	0.10	0.06	0.23	0.24
	Country-specific	2.11	0.18	0.41	0.33	0.57	0.62
Germany	Case 7	0.64	0.10	0.09	0.02	0.21	0.22
	Case 8	0.83	0.11	0.14	0.06	0.26	0.26
	Country-specific	1.19	0.02	0.06	0.17	0.45	0.49
Ireland	Case 7	0.21	0.06	0.09	0.00	0.03	0.03
	Case 8	0.24	0.06	0.10	0.01	0.04	0.03
	Country-specific	0.91	0.15	0.32	0.06	0.18	0.20

Table 7. A common strategy or a country-specific one: a comparative welfare analysis (cont'd)

Country	Strategy	Sum of % deviations in RELU	Welfare impact by birth cohort				
			1916	1946	1976	2006	2036
Italy	Case 7	1.00	0.02	0.05	0.08	0.43	0.42
	Case 8	1.11	0.04	0.12	0.13	0.43	0.39
	Country-specific	1.85	-0.06	0.11	0.28	0.74	0.78
Netherlands	Case 7	0.29	0.04	0.08	0.02	0.07	0.08
	Case 8	0.37	0.04	0.09	0.03	0.10	0.11
	Country-specific	1.43	0.13	0.39	0.21	0.33	0.37
Portugal	Case 7	3.13	1.55	0.44	0.22	0.45	0.47
	Case 8	2.71	1.53	0.40	0.19	0.33	0.26
	Country-specific	4.00	1.90	0.81	0.32	0.48	0.49
Spain	Case 7	0.39	0.07	0.10	0.04	0.10	0.08
	Case 8	0.40	0.07	0.11	0.05	0.10	0.07
	Country-specific	1.32	0.18	0.37	0.21	0.28	0.28
Sweden	Case 7	0.04	0.02	0.02	-0.02	0.01	0.01
	Case 8	0.11	0.02	0.03	0.00	0.03	0.03
	Country-specific	0.19	0.01	0.03	0.02	0.06	0.07
United Kingdom	Case 7	0.23	0.04	0.07	0.02	0.05	0.05
	Case 8	0.15	0.04	0.02	0.00	0.05	0.04
	Country-specific	0.44	0.03	0.09	0.07	0.12	0.13

VI. Concluding Remarks

Most countries in Europe are faced with a significant challenge of placing their public finances on a more sustainable footing. To address this, it would be sensible for policymakers to adopt a welfare perspective to characterize the best strategy of fiscal adjustment. Using a generational accounting model with a detailed welfare analysis, simulation results in this paper suggest that the Stockholm Agenda—which recommends a multi-pronged approach based on increasing labor utilization, furthering entitlement reform, and accelerating fiscal consolidation—is a useful starting point. However, it should be tailored to account for structural differences (relating to preferences, technology and the state of public finances) across countries, and it does not seem advisable for any country to include elements from all three prongs. Boosting labor utilization is the single most important aspect of the strategy for every country and should always be present. In general, the country-specific strategies do not give rise to generational conflict, and such conflict can be avoided by addressing fiscal problems early on.

The customary caveats of the analysis should be mentioned. For a start, the underlying framework suffers from a few limitations and so the simulation results need to be interpreted with caution, in particular when trying to draw firm policy conclusions. Perhaps the most serious limitation is the use of an accounting rather than an economic model with an applied general equilibrium flavor. In such a model, factor prices (such as interest rates and wages) and factor supplies respond endogenously to changes in the economic environment. As a result, tax bases respond to changes in tax rates. Working with an economic model would also allow changes in public investment flows to affect GDP performance. Even though Fehr and Kotlikoff (1997) argue that changes in generational accounts do a reasonable job in tracking the generational incidence of fiscal policy in general equilibrium, it is unclear whether the present assessment of the Stockholm Agenda would still stand if an economic model had instead been used. This is an important issue that future work should address.

Similarly, a comprehensive sensitivity analysis is required to determine how the welfare ranking of the alternative policies changes under different constellations of labor productivity, discount rates, and preference parameters. Improvements in the quality of public expenditure would also change the results.

The remaining caveats that are worth highlighting involve data and parameterization issues. In many countries, the personal income tax base includes not only labor income but also pension income. Here, the assumption is that only people aged 15 to 64 pay personal income taxes, which may be biasing the results, albeit to a limited extent. Furthermore, age- and gender-specific profiles of revenue and public spending need to be updated, as the profiles used are almost ten years old. Also, Eurostat has just provided a new set of demographic projections for the 25 EU members that projects even higher old age dependency rates than before. Revised assumptions on fertility rates, mortality rates, and migration can then be used to project the population in each country until as late as 2150, which is crucial to capture the whole lifetime of the cohort born in 2050.

Despite these shortcomings, this accounting framework offers some interesting insights, and seems to be a useful starting point for further more elaborate work.

REFERENCES

Afonso, António, Ludger Schuknecht, and Vito Tanzi, 2003, "Public Sector Efficiency: An International Comparison", ECB Working Paper No. 242.

Auerbach, Alan, Laurence Kotlikoff, and Willi Leibfritz, 1999, *Generational Accounting Around the World*, NBER, The University of Chicago Press.

Black, Richard, Douglas Laxton, David Rose, and Robert Tetlow, 1994, "Bank of Canada's New Quarterly Projection Model (Part I – The Steady State Model: SSQPM)", Technical Report No. 72, Bank of Canada.

Cardarelli, R., J. Sefton, and L.J. Kotlikoff, 1999, "Generational Accounting in the UK", National Institute for Economic and Social Research, Discussion Paper No. 147.

Duval, Romain, 2003, "The Retirement Effects of Old-Age Pension and Early Retirement Schemes in OECD Countries", OECD Economics Department Working Paper No. 370.

Elmeskov, Jørgen, 2004, "Aging, Public Budgets, and the Need for Policy Reform", *Review of International Economics*, 12(2), 233-242.

European Commission, 1999, *Generational Accounting in Europe*, European Economy Reports and Studies, 6.

European Council, 2001, "Presidency Conclusions of the Stockholm European Council: 23 and 24 March 2001".

Eurostat, 2004, *Structures of Taxation Systems in the European Union*.

Fehr, Hans, and Laurence Kotlikoff, 1997, "Generational Accounting in General Equilibrium", *NBER Working Paper* 5090.

James, Steven, 1994, "Debt Reduction with Distorting Taxes and Incomplete Ricardianism: A Computable Dynamic General Equilibrium Analysis", in Robson, W. and W. Scarth (Eds.), *Deficit Reduction: What Pain, What Gain?*, C. D. Howe Institute, Policy Study No. 23.

Jaumotte, Florence, 2003, "Female Labour Force Participation: Past Trends and Main Determinants in OECD Countries", OECD Economics Department Working Papers, No. 376.

Kimball, Miles, and Matthew Shapiro, 2003, "Labor Supply: Are the Income and Substitution Effects Both Large or Both Small?", University of Michigan mimeo.

Kotlikoff, Laurence, 2004, *The Coming Generational Storm*, MIT Press.

Ministerio de Trabajo y Asuntos Sociales, 2002, *Encuesta de Coyuntura Laboral*, Madrid.

Oreopoulos, Phillip, and Kotlikoff, Laurence, 1996, "Restoring Generational Balance in Canada," *Choices*, Vol. 2, No. 1, February.

OECD, 2004a, *Economic Outlook*, No. 75.

OECD, 2004b, *Employment Outlook*, Statistical Annex.

A N N E X

Table A.1 Simulation results for Austria (adjustment from 2006 to 2015)

Case 1. Adjustment through labor taxes and social security contributions

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Tau_L (%)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	39.2	1.00	41.7 ; -0.5	0.16	0.22	-0.05	0.13	0.13
2010	46.2	0.99	28.0 ; 3.2					
2015	54.5	0.99	-6.9 ; 8.7			Sum of % dev. in RELU		
2050	54.5	0.99	-118.3 ; 1.7			0.59		

Case 2. Adjustment through consumption taxes

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Tau_C (%)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	22.0	1.00	41.7 ; -0.5	0.12	0.03	-0.18	-0.18	-0.29
2010	27.3	0.94	27.9 ; 3.0					
2015	33.8	0.94	-4.8 ; 8.1			Sum of % dev. in RELU		
2050	33.8	0.94	-107.3 ; 1.3			-0.50		

Case 3. Adjustment through public consumption, general government subsidies, and public investment (CG), health care (He) and education (Ed)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	CG, He, Ed (% GDP)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	14.5 ; 6.9 ; 5.6	1.00	41.7 ; -0.5	0.09	-0.16	-0.30	-0.30	-0.37
2010	11.4 ; 6.7 ; 4.7	1.06	24.0 ; 4.1					
2015	8.9 ; 6.5 ; 3.9	1.05	-12.1 ; 8.5			Sum of % dev. in RELU		
2050	8.9 ; 10.0 ; 4.1	1.05	-121.1 ; 2.0			-1.04		

Case 4. Adjustment through social protection transfers (TR)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	TR (% GDP)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	21.9	1.00	41.7 ; -0.5	-0.18	-0.30	-0.08	0.18	0.18
2010	19.0	1.00	28.7 ; 2.8					
2015	16.4	0.99	0.5 ; 6.5			Sum of % dev. in RELU		
2050	23.9	0.98	-73.9 ; 0.2			-0.20		

Table A.1 Simulation results for Austria (Cont'd)

Case 5. Adjustment through the employment rates of mature workers aged 25-54 and of older workers aged 55-64

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Eta_25-54 ; Eta_55-64 (%)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	83.9 ; 29.7	1.00	41.7 ; -0.5	0.22	0.48	0.16	0.39	0.42
2010	92.1 ; 39.1	0.91	22.4 ; 3.1					
2015	101.0 ; 51.4	0.88	-6.5 ; 6.4			Sum of % dev. in RELU		
2050	101.0 ; 51.4	0.88	-74.6 ; 0.1			1.67		
	OECD limits: 90.2 ; 48.0							

Case 6. Adjustment through aggregate hours worked per year (H)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	H	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	1567	1.00	41.7 ; -0.5	0.22	0.49	0.03	0.18	0.22
2010	1780	0.89	21.1 ; 3.4					
2015	2021	0.89	-7.0 ; 6.7			Sum of % dev. in RELU		
2050	2021	0.89	-82.3 ; 0.5			1.14		

Case 7. A spending-based Stockholm Agenda: adjustment through employment rates (Etas), social protection transfers (TR), and public consumption (CG), health care and education

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	_25-54 ; _55-64 ; TR ; CG ; He ; Ed	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	83.9 ; 29.7 ; 21.9 ; 14.5 ; 6.9 ; 5.6	1.00	41.7 ; -0.5	0.06	0.06	-0.01	0.15	0.14
2010	86.8 ; 32.9 ; 20.7 ; 13.6 ; 6.8 ; 4.9	0.98	25.3 ; 3.2					
2015	89.9 ; 36.4 ; 19.4 ; 12.7 ; 6.7 ; 4.2	0.97	-5.5 ; 7.1			Sum of % dev. in RELU		
2050	89.9 ; 36.4 ; 28.1 ; 12.7 ; 10.3 ; 4.4	0.97	-89.0 ; 0.7			0.40		

Case 8. A tax-based Stockholm Agenda: adjustment through employment rates (Etas), social protection transfers (TR), and consumption taxes (Tau_C)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	_25-54 ; _55-64 ; TR ; Tau_C	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	83.9 ; 29.7 ; 21.9 ; 22.0	1.00	41.7 ; -0.5	0.07	0.10	0.01	0.17	0.15
2010	86.8 ; 32.9 ; 20.7 ; 23.9	0.95	25.7 ; 3.1					
2015	89.9 ; 36.4 ; 19.4 ; 26.0	0.94	-4.7 ; 7.0			Sum of % dev. in RELU		
2050	89.9 ; 36.4 ; 28.1 ; 26.0	0.94	-85.4 ; 0.5			0.50		

Table A.2 Simulation results for Belgium (adjustment from 2006 to 2015)

Case 1. Adjustment through labor taxes and social security contributions

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Tau_L (%)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	43.5	1.00	88.7 ; 0.3	0.06	0.08	-0.02	0.04	0.04
2010	46.2	1.00	69.8 ; 2.0					
2015	49.1	1.00	45.8 ; 3.9			Sum of % dev. in RELU		
2050	49.1	1.00	8.6 ; -1.2			0.20		

Case 2. Adjustment through consumption taxes

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Tau_C (%)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	21.7	1.00	88.7 ; 0.3	0.04	0.01	-0.06	-0.06	-0.09
2010	24.0	0.98	69.7 ; 2.0					
2015	26.6	0.98	46.2 ; 3.7			Sum of % dev. in RELU		
2050	26.6	0.98	10.3 ; -1.2			-0.16		

Case 3. Adjustment through public consumption, general government subsidies, and public investment (CG), health care (He) and education (Ed)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	CG, He, Ed (% GDP)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	13.8 ; 6.8 ; 6.4	1.00	88.7 ; 0.3	0.03	-0.05	-0.11	-0.11	-0.13
2010	12.7 ; 6.8 ; 5.9	1.02	68.9 ; 2.2					
2015	11.7 ; 6.9 ; 5.5	1.02	44.6 ; 3.9			Sum of % dev. in RELU		
2050	11.7 ; 8.7 ; 6.0	1.02	4.4 ; -0.9			-0.37		

Case 4. Adjustment through social protection transfers (TR)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	TR (% GDP)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	18.1	1.00	88.7 ; 0.3	-0.06	-0.11	-0.03	0.05	0.06
2010	17.5	1.00	70.4 ; 1.8					
2015	17.2	0.99	48.6 ; 3.3			Sum of % dev. in RELU		
2050	22.1	0.99	17.8 ; -1.4			-0.09		

Table A.2 Simulation results for Belgium (Cont'd)

Case 5. Adjustment through the employment rates of mature workers aged 25-54 and of older workers aged 55-64

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Eta_25-54 ; Eta_55-64 (%)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	76.5 ; 26.6	1.00	88.7 ; 0.3	0.08	0.18	0.07	0.16	0.17
2010	79.3 ; 29.6	0.96	65.7 ; 2.1					
2015	82.2 ; 32.9	0.96	40.9 ; 3.4			Sum of % dev. in RELU		
2050	82.2 ; 32.9	0.96	14.1 ; -1.6			0.66		
	OECD limits: 81.5 ; 50.0							

Case 6. Adjustment through aggregate hours worked per year (H)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	H	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	1547	1.00	88.7 ; 0.3	0.09	0.18	0.04	0.13	0.15
2010	1622	0.96	65.3 ; 1.8					
2015	1700	0.96	40.4 ; 3.5			Sum of % dev. in RELU		
2050	1700	0.96	12.0 ; -1.4			0.59		

Case 7. A spending-based Stockholm Agenda: adjustment through employment rates (Etas), social protection transfers (TR), and public consumption (CG), health care and education

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	_25-54 ; _55-64 ; TR ; CG ; He ; Ed	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	76.5 ; 26.6 ; 18.1 ; 13.8 ; 6.8 ; 6.4	1.00	88.7 ; 0.3	0.02	0.02	-0.01	0.04	0.04
2010	77.5 ; 27.6 ; 18.1 ; 13.5 ; 6.8 ; 6.0	0.99	68.3 ; 2.0					
2015	78.4 ; 28.6 ; 18.4 ; 13.1 ; 6.9 ; 5.6	0.99	44.7 ; 3.5			Sum of % dev. in RELU		
2050	78.4 ; 28.6 ; 23.7 ; 13.1 ; 8.7 ; 6.1	0.99	12.1 ; -1.3			0.11		

Case 8. A tax-based Stockholm Agenda: adjustment through employment rates (Etas), social protection transfers (TR), and consumption taxes (Tau_C)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	_25-54 ; _55-64 ; TR ; Tau_C	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	76.5 ; 26.6 ; 18.1 ; 21.7	1.00	88.7 ; 0.3	0.02	0.03	0.00	0.05	0.05
2010	77.5 ; 27.6 ; 18.1 ; 22.5	0.98	68.4 ; 2.0					
2015	78.4 ; 28.6 ; 18.4 ; 23.3	0.98	45.0 ; 3.5			Sum of % dev. in RELU		
2050	78.4 ; 28.6 ; 23.7 ; 23.3	0.98	14.0 ; -1.4			0.15		

Table A.3 Simulation results for Denmark (adjustment from 2006 to 2015)

Case 1. Adjustment through labor taxes and social security contributions

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Tau_L (%)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	39.9	1.00	0.2 ; 2.1	0.03	0.05	-0.02	0.03	0.04
2010	42.3	1.00	-10.7 ; 2.5					
2015	44.8	1.00	-22.6 ; 3.3			Sum of % dev. in RELU		
2050	44.8	1.00	32.0 ; -4.6			0.13		

Case 2. Adjustment through consumption taxes

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Tau_C (%)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	33.7	1.00	0.2 ; 2.1	0.02	-0.01	-0.05	-0.06	-0.09
2010	35.9	0.98	-10.9 ; 2.5					
2015	38.3	0.98	-22.5 ; 3.2			Sum of % dev. in RELU		
2050	38.3	0.98	31.6 ; -4.5			-0.19		

Case 3. Adjustment through public consumption, general government subsidies, and public investment (CG), health care (He) and education (Ed)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	CG, He, Ed (% GDP)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	15.8 ; 5.7 ; 8.5	1.00	0.2 ; 2.1	0.01	-0.06	-0.12	-0.12	-0.13
2010	14.8 ; 5.7 ; 8.5	1.02	-11.7 ; 2.8					
2015	13.8 ; 5.9 ; 8.2	1.02	-24.3 ; 3.4			Sum of % dev. in RELU		
2050	13.8 ; 7.5 ; 8.1	1.02	26.7 ; -4.2			-0.42		

Case 4. Adjustment through social protection transfers (TR)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	TR (% GDP)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	25.2	1.00	0.2 ; 2.1	-0.05	-0.07	-0.01	0.03	0.03
2010	25.0	1.00	-10.3 ; 2.4					
2015	25.0	1.00	-20.8 ; 2.9			Sum of % dev. in RELU		
2050	29.0	1.00	35.7 ; -4.7			-0.07		

Table A.3 Simulation results for Denmark (Cont'd)

Case 5. Adjustment through the employment rates of mature workers aged 25-54 and of older workers aged 55-64

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Eta_25-54 ; Eta_55-64 (%)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	84.1 ; 57.9	1.00	0.2 ; 2.1	0.06	0.13	0.04	0.11	0.12
2010	86.9 ; 63.9	0.96	-11.5 ; 2.6					
2015	89.8 ; 70.5	0.95	-21.8 ; 2.9			Sum of % dev. in RELU		
2050	89.8 ; 70.5	0.95	34.9 ; -4.7			0.46		
	OECD limits: 87.1 ; 71.5							

Case 6. Adjustment through aggregate hours worked per year (H)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	H	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	1462	1.00	0.2 ; 2.1	0.06	0.14	0.03	0.06	0.08
2010	1530	0.95	-11.6 ; 2.6					
2015	1600	0.95	-22.1 ; 3.0			Sum of % dev. in RELU		
2050	1600	0.95	32.5 ; -4.5			0.37		

Case 7. A spending-based Stockholm Agenda: adjustment through employment rates (Etas), social protection transfers (TR), and public consumption (CG), health care and education

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	_25-54 ; _55-64 ; TR ; CG ; He ; Ed	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	84.1 ; 57.9 ; 25.2 ; 15.8 ; 5.7 ; 8.5	1.00	0.2 ; 2.1	0.01	0.01	-0.02	0.01	0.01
2010	85.1 ; 59.9 ; 25.6 ; 15.5 ; 5.7 ; 8.6	0.99	-11.1 ; 2.6					
2015	86.0 ; 62.0 ; 26.2 ; 15.2 ; 5.9 ; 8.4	0.99	-22.2 ; 3.1			Sum of % dev. in RELU		
2050	86.0 ; 62.0 ; 30.3 ; 15.2 ; 7.5 ; 8.2	0.99	32.5 ; -4.5			0.02		

Case 8. A tax-based Stockholm Agenda: adjustment through employment rates (Etas), social protection transfers (TR), and consumption taxes (Tau_C)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	_25-54 ; _55-64 ; TR ; Tau_C	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	84.1 ; 57.9 ; 25.2 ; 33.7	1.00	0.2 ; 2.1	0.01	0.02	0.00	0.03	0.03
2010	85.1 ; 59.9 ; 25.6 ; 34.5	0.98	-11.0 ; 2.5					
2015	86.0 ; 62.0 ; 26.2 ; 35.2	0.98	-21.8 ; 3.0			Sum of % dev. in RELU		
2050	86.0 ; 62.0 ; 30.3 ; 35.2	0.98	34.0 ; -4.6			0.09		

Table A.4 Simulation results for Finland (adjustment from 2006 to 2015)

Case 1. Adjustment through labor taxes and social security contributions

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Tau_L (%)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	43.9	1.00	-42.3 ; 4.6	0.08	0.08	-0.02	0.05	0.06
2010	46.6	1.00	-54.8 ; 4.3					
2015	49.5	1.00	-63.3 ; 3.7			Sum of % dev. in RELU		
2050	49.5	1.00	46.9 ; -6.8			0.25		

Case 2. Adjustment through consumption taxes

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Tau_C (%)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	28.0	1.00	-42.3 ; 4.6	0.06	0.01	-0.05	-0.12	-0.18
2010	30.3	0.98	-55.0 ; 4.3					
2015	32.7	0.98	-63.3 ; 3.6			Sum of % dev. in RELU		
2050	32.7	0.98	45.8 ; -6.7			-0.28		

Case 3. Adjustment through public consumption, general government subsidies, and public investment (CG), health care (He) and education (Ed)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	CG, He, Ed (% GDP)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	15.7 ; 6.5 ; 6.6	1.00	-42.3 ; 4.6	0.05	-0.07	-0.14	-0.13	-0.15
2010	14.6 ; 6.6 ; 6.1	1.02	-55.7 ; 4.5					
2015	13.6 ; 6.9 ; 5.7	1.02	-64.5 ; 3.7			Sum of % dev. in RELU		
2050	13.6 ; 9.0 ; 5.7	1.02	43.8 ; -6.6			-0.44		

Case 4. Adjustment through social protection transfers (TR)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	TR (% GDP)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	22.2	1.00	-42.3 ; 4.6	-0.03	-0.09	-0.01	0.05	0.05
2010	23.0	1.00	-54.2 ; 4.0					
2015	23.9	1.00	-61.0 ; 3.2			Sum of % dev. in RELU		
2050	28.3	1.00	52.1 ; -7.1			-0.03		

Table A.4 Simulation results for Finland (Cont'd)

Case 5. Adjustment through the employment rates of mature workers aged 25-54 and of older workers aged 55-64

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Eta_25-54 ; Eta_55-64 (%)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	81.6 ; 47.8	1.00	-42.3 ; 4.6	0.11	0.19	0.09	0.17	0.19
2010	84.3 ; 52.8	0.95	-53.3 ; 4.2					
2015	87.2 ; 58.2	0.95	-58.4 ; 3.2			Sum of % dev. in RELU		
2050	87.2 ; 58.2	0.95	49.8 ; -6.8			0.75		
	OECD limits: 83.0 ; 71.0							

Case 6. Adjustment through aggregate hours worked per year (H)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	H	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	1686	1.00	-42.3 ; 4.6	0.11	0.19	0.07	0.14	0.16
2010	1764	0.95	-53.4 ; 4.2					
2015	1846	0.95	-58.6 ; 3.3			Sum of % dev. in RELU		
2050	1846	0.95	47.4 ; -6.6			0.67		

Case 7. A spending-based Stockholm Agenda: adjustment through employment rates (Etas), social protection transfers (TR), and public consumption (CG), health care and education

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	_25-54 ; _55-64 ; TR ; CG ; He ; Ed	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	81.6 ; 47.8 ; 22.2 ; 15.7 ; 6.5 ; 6.6	1.00	-42.3 ; 4.6	0.05	0.01	-0.01	0.04	0.04
2010	82.5 ; 49.5 ; 23.5 ; 15.3 ; 6.6 ; 6.3	0.99	-54.3 ; 4.2					
2015	83.5 ; 51.2 ; 24.9 ; 15.0 ; 6.9 ; 6.1	0.99	-60.9 ; 3.4			Sum of % dev. in RELU		
2050	83.5 ; 51.2 ; 29.4 ; 15.0 ; 9.0 ; 6.0	0.99	49.2 ; -6.9			0.13		

Case 8. A tax-based Stockholm Agenda: adjustment through employment rates (Etas), social protection transfers (TR), and consumption taxes (Tau_C)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	_25-54 ; _55-64 ; TR ; Tau_C	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	81.6 ; 47.8 ; 22.2 ; 28.0	1.00	-42.3 ; 4.6	0.05	0.04	0.02	0.04	0.03
2010	82.5 ; 49.5 ; 23.5 ; 28.8	0.98	-54.3 ; 4.2					
2015	83.5 ; 51.2 ; 24.9 ; 29.6	0.98	-60.9 ; 3.4			Sum of % dev. in RELU		
2050	83.5 ; 51.2 ; 29.4 ; 29.6	0.98	49.2 ; -6.9			0.18		

Table A.5 Simulation results for France (adjustment from 2006 to 2015)

Case 1. Adjustment through labor taxes and social security contributions

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Tau_L (%)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	41.8	1.00	44.4 ; -3.1	0.12	0.21	-0.09	0.20	0.24
2010	48.5	0.99	44.1 ; -0.1					
2015	56.3	0.99	30.4 ; 3.2			Sum of % dev. in RELU		
2050	56.3	0.99	24.7 ; -3.0			0.68		

Case 2. Adjustment through consumption taxes

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Tau_C (%)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	17.4	1.00	44.4 ; -3.1	0.08	-0.04	-0.21	-0.20	-0.28
2010	21.7	0.94	43.4 ; -0.2					
2015	27.1	0.93	31.0 ; 2.8			Sum of % dev. in RELU		
2050	27.1	0.93	28.6 ; -3.1			-0.65		

Case 3. Adjustment through public consumption, general government subsidies, and public investment (CG), health care (He) and education (Ed)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	CG, He, Ed (% GDP)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	15.7 ; 8.4 ; 5.8	1.00	44.4 ; -3.1	0.06	-0.08	-0.17	-0.06	-0.08
2010	13.0 ; 8.0 ; 5.1	1.06	43.9 ; -0.2					
2015	10.7 ; 7.8 ; 4.6	1.06	33.3 ; 2.0			Sum of % dev. in RELU		
2050	10.7 ; 9.3 ; 4.7	1.06	39.5 ; -3.3			-0.33		

Case 4. Adjustment through social protection transfers (TR)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	TR (% GDP)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	20.7	1.00	44.4 ; -3.1	-0.14	-0.27	-0.05	0.19	0.22
2010	17.4	1.00	43.9 ; -0.2				.	
2015	15.4	0.99	33.3 ; 2.0			Sum of % dev. in RELU		
2050	19.5	0.98	39.5 ; -3.3			-0.05		

Table A.5 Simulation results for France (Cont'd)

Case 5. Adjustment through the employment rates of mature workers aged 25-54 and of older workers aged 55-64

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Eta_25-54 ; Eta_55-64 (%)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	79.5 ; 34.7	1.00	44.4 ; -3.1	0.25	0.52	0.33	0.59	0.66
2010	86.3 ; 44.2	0.91	36.7 ; 0.3					
2015	93.7 ; 56.3	0.90	21.7 ; 2.3			Sum of % dev. in RELU		
2050	93.7 ; 56.3	0.90	31.5 ; -3.3			2.35		
	OECD limits: 86.6 ; 60.0							

Case 6. Adjustment through aggregate hours worked per year (H)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	H	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	1459	1.00	44.4 ; -3.1	0.25	0.52	0.25	0.52	0.59
2010	1636	0.91	36.0 ; 0.4					
2015	1837	0.90	20.7 ; 2.4			Sum of % dev. in RELU		
2050	1837	0.90	27.8 ; -3.1			2.13		

Case 7. A spending-based Stockholm Agenda: adjustment through employment rates (Etas), social protection transfers (TR), and public consumption (CG), health care and education

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	_25-54 ; _55-64 ; TR ; CG ; He ; Ed	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	79.5 ; 34.7 ; 20.7 ; 15.7 ; 8.4 ; 5.8	1.00	44.4 ; -3.1	0.07	0.10	0.08	0.29	0.31
2010	81.9 ; 37.9 ; 19.0 ; 14.9 ; 8.1 ; 5.2	0.99	40.4 ; 0.1					
2015	84.4 ; 41.4 ; 18.3 ; 14.1 ; 7.9 ; 4.9	0.98	26.8 ; 2.5			Sum of % dev. in RELU		
2050	84.4 ; 41.4 ; 23.3 ; 14.1 ; 9.4 ; 4.9	0.98	27.4 ; -2.9			0.85		

Case 8. A tax-based Stockholm Agenda: adjustment through employment rates (Etas), social protection transfers (TR), and consumption taxes (Tau_C)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	_25-54 ; _55-64 ; TR ; Tau_C	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	79.5 ; 34.7 ; 20.7 ; 17.4	1.00	44.4 ; -3.1	0.07	0.10	0.06	0.23	0.24
2010	81.9 ; 37.9 ; 19.0 ; 18.9	0.95	40.8 ; 0.0					
2015	84.4 ; 41.4 ; 18.3 ; 20.6	0.94	27.7 ; 2.4			Sum of % dev. in RELU		
2050	84.4 ; 41.4 ; 23.3 ; 20.6	0.94	32.6 ; -3.2			0.70		

Table A.6 Simulation results for Germany (adjustment from 2006 to 2015)

Case 1. Adjustment through labor taxes and social security contributions

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Tau_L (%)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	39.9	1.00	57.4 ; -4.7	0.20	0.34	-0.10	0.16	0.19
2010	49.9	1.00	61.0 ; -0.3					
2015	62.5	1.00	36.7 ; 6.7			Sum of % dev. in RELU		
2050	62.5	1.00	-24.7 ; -0.9			0.79		

Case 2. Adjustment through consumption taxes

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Tau_C (%)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	18.3	1.00	57.4 ; -4.7	0.14	-0.03	-0.26	-0.27	-0.40
2010	26.0	0.92	62.6 ; -1.1					
2015	36.9	0.91	43.2 ; 5.7			Sum of % dev. in RELU		
2050	36.9	0.91	-24.3 ; -0.3			-0.82		

Case 3. Adjustment through public consumption, general government subsidies, and public investment (CG), health care (He) and education (Ed)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	CG, He, Ed (% GDP)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	12.8 ; 6.5 ; 4.2	1.00	57.4 ; -4.7	0.06	-0.40	-0.62	-0.70	-0.82
2010	7.6 ; 5.8 ; 3.2	1.10	52.6 ; 1.8					
2015	4.6 ; 5.3 ; 2.4	1.09	24.3 ; 6.5			Sum of % dev. in RELU		
2050	4.6 ; 7.3 ; 2.6	1.09	-28.7 ; -0.8			-2.48		

Case 4. Adjustment through social protection transfers (TR)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	TR (% GDP)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	22.9	1.00	57.4 ; -4.7	-0.25	-0.51	-0.07	0.18	0.20
2010	17.3	1.00	59.9 ; -0.2				.	
2015	13,4	0.98	42.2 ; 4.0			Sum of % dev. in RELU		
2050	18.2	0.97	-12.5 ; -0.2			-0.45		

Table A.6 Simulation results for Germany (Cont'd)

Case 5. Adjustment through the employment rates of mature workers aged 25-54 and of older workers aged 55-64

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Eta_25-54 ; Eta_55-64 (%)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	78.8 ; 38.8	1.00	57.4 ; -4.7	0.36	0.72	0.16	0.55	0.63
2010	91.7 ; 60.4	0.86	47.9 ; 0.0					
2015	106.8 ; 94.1	0.82	23.5 ; 4.1			Sum of % dev. in RELU		
2050	106.8 ; 94.1	0.83	-5.8 ; -1.3			2.42		
	OECD limits: 85.6 ; 70.0							

Case 6. Adjustment through aggregate hours worked per year (H)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	H	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	1443	1.00	57.4 ; -4.7	0.37	0.75	0.12	0.30	0.39
2010	1765	0.84	47.9 ; 0.0					
2015	2160	0.82	23.5 ; 4.1			Sum of % dev. in RELU		
2050	2160	0.82	-5.8 ; -1.3			1.93		

Case 7. A spending-based Stockholm Agenda: adjustment through employment rates (Etas), social protection transfers (TR), and public consumption (CG), health care and education

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	_25-54 ; _55-64 ; TR ; CG ; He ; Ed	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	78.8 ; 38.8 ; 22.9 ; 12.8 ; 6.5 ; 4.2	1.00	57.4 ; -4.7	0.10	0.09	0.02	0.21	0.22
2010	83.6 ; 46.2 ; 20.1 ; 11.4 ; 6.2 ; 3.6	0.98	54.3 ; 0.1					
2015	88.7 ; 55.0 ; 18.1 ; 10.1 ; 5.9 ; 3.0	0.96	31.2 ; 4.8			Sum of % dev. in RELU		
2050	88.7 ; 55.0 ; 24.5 ; 10.1 ; 8.2 ; 3.3	0.96	-15.5 ; -0.7			0.64		

Case 8. A tax-based Stockholm Agenda: adjustment through employment rates (Etas), social protection transfers (TR), and consumption taxes (Tau_C)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	_25-54 ; _55-64 ; TR ; Tau_C	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	78.8 ; 38.8 ; 22.9 ; 18.3	1.00	57.4 ; -4.7	0.11	0.14	0.06	0.26	0.26
2010	83.6 ; 46.2 ; 20.1 ; 21.2	0.93	55.1 ; -0.2					
2015	88.7 ; 55.0 ; 18.1 ; 24.6	0.91	32.9 ; 4.6			Sum of % dev. in RELU		
2050	88.7 ; 55.0 ; 24.5 ; 24.6	0.91	-13.5 ; -0.7			0.83		

Table A.7 Simulation results for Ireland (adjustment from 2006 to 2015)

Case 1. Adjustment through labor taxes and social security contributions

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Tau_L (%)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	25.9	1.00	29.9 ; -1.5	0.05	0.09	0.00	0.01	0.01
2010	29.6	1.00	23.1 ; 0.1					
2015	33.9	1.00	12.1 ; 1.6			Sum of % dev. in RELU		
2050	33.9	1.00	13.1 ; -3.0			0.16		

Case 2. Adjustment through consumption taxes

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Tau_C (%)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	25.8	1.00	29.9 ; -1.5	0.02	-0.04	-0.07	-0.13	-0.18
2010	28.6	0.97	22.8 ; 0.1					
2015	31.7	0.97	12.1 ; 1.5			Sum of % dev. in RELU		
2050	31.7	0.97	14.2 ; -3.0			-0.40		

Case 3. Adjustment through public consumption, general government subsidies, and public investment (CG), health care (He) and education (Ed)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	CG, He, Ed (% GDP)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	13.2 ; 6.3 ; 4.0	1.00	29.9 ; -1.5	0.02	-0.08	-0.12	-0.16	-0.18
2010	12.1 ; 6.2 ; 3.6	1.02	22.2 ; 0.3					
2015	11.0 ; 6.3 ; 3.3	1.02	10.9 ; 1.6			Sum of % dev. in RELU		
2050	11.0 ; 7.5 ; 3.3	1.02	12.9 ; -2.9			-0.52		

Case 4. Adjustment through social protection transfers (TR)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	TR (% GDP)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	9.2	1.00	29.9 ; -1.5	-0.06	-0.09	-0.03	0.01	0.01
2010	7.9	1.00	23.5 ; -0.1				.	
2015	7.1	1.00	14.6 ; 0.9			Sum of % dev. in RELU		
2050	9.6	0.99	21.0 ; -3.3			-0.16		

Table A.7 Simulation results for Ireland (Cont'd)

Case 5. Adjustment through the employment rates of mature workers aged 25-54 and of older workers aged 55-64

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Eta_25-54 ; Eta_55-64 (%)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	76.0 ; 47.1	1.00	29.9 ; -1.5	0.20	0.40	0.06	0.17	0.20
2010	82.2 ; 59.4	0.90	20.5 ; 0.0					
2015	88.9 ; 74.9	0.90	11.1 ; 0.8			Sum of % dev. in RELU		
2050	88.9 ; 74.9	0.90	23.3 ; -3.6			1.03		
	OECD limits: 83.0 ; 83.0							

Case 6. Adjustment through aggregate hours worked per year (H)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	H	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	1666	1.00	29.9 ; -1.5	0.21	0.43	0.08	0.12	0.15
2010	1833	0.89	19.8 ; 0.2					
2015	2017	0.89	9.8 ; 1.0			Sum of % dev. in RELU		
2050	2017	0.89	20.8 ; -3.4			0.99		

Case 7. A spending-based Stockholm Agenda: adjustment through employment rates (Etas), social protection transfers (TR), and public consumption (CG), health care and education

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	_25-54 ; _55-64 ; TR ; CG ; He ; Ed	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	76.0 ; 47.1 ; 9.2 ; 13.2 ; 6.3 ; 4.0	1.00	29.9 ; -1.5	0.06	0.09	0.00	0.03	0.03
2010	78.1 ; 51.2 ; 8.6 ; 12.8 ; 6.1 ; 3.6	1.00	22.0 ; 0.0					
2015	80.4 ; 55.7 ; 8.2 ; 12.5 ; 6.1 ; 3.3	0.97	12.2 ; 1.1			Sum of % dev. in RELU		
2050	80.4 ; 55.7 ; 11.1 ; 12.5 ; 8.2 ; 3.2	0.97	18.9 ; -3.3			0.21		

Case 8. A tax-based Stockholm Agenda: adjustment through employment rates (Etas), social protection transfers (TR), and consumption taxes (Tau_C)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	_25-54 ; _55-64 ; TR ; Tau_C	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	76.0 ; 47.1 ; 9.2 ; 25.8	1.00	29.9 ; -1.5	0.06	0.10	0.01	0.04	0.03
2010	78.1 ; 51.2 ; 8.6 ; 26.7	0.96	22.1 ; 0.0					
2015	80.4 ; 55.7 ; 8.2 ; 27.7	0.96	12.3 ; 1.1			Sum of % dev. in RELU		
2050	80.4 ; 55.7 ; 11.1 ; 27.7	0.96	19.3 ; -3.3			0.24		

Table A.8 Simulation results for Italy (adjustment from 2006 to 2015)

Case 1. Adjustment through labor taxes and social security contributions

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Tau_L (%)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	41.1	1.00	92.9 ; -3.2	0.21	0.34	-0.14	0.14	0.16
2010	55	0.98	80.8 ; 1.7					
2015	73.7	0.97	38.3 ; 10.3			Sum of % dev. in RELU		
2050	73.7	0.97	-56.2 ; -2.8			0.71		

Case 2. Adjustment through consumption taxes

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Tau_C (%)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	17.1	1.00	92.9 ; -3.2	0.14	-0.05	-0.27	-0.39	-0.65
2010	25.2	0.91	81.5 ; 1.0					
2015	37.0	0.90	44.6 ; 8.9			Sum of % dev. in RELU		
2050	37.0	0.89	-55.0 ; -1.8			-1.22		

Case 3. Adjustment through public consumption, general government subsidies, and public investment (CG), health care (He) and education (Ed)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	CG, He, Ed (% GDP)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	13.1 ; 6.6 ; 4.8	1.00	92.9 ; -3.2	0.04	-0.54	-0.71	-0.71	-0.88
2010	7.2 ; 5.7 ; 3.6	1.12	69.4 ; 4.5					
2015	4.0 ; 5.0 ; 2.7	1.10	21.8 ; 10.0			Sum of % dev. in RELU		
2050	4.0 ; 6.9 ; 3.0	1.09	-52.4 ; -3.0			-2.80		

Case 4. Adjustment through social protection transfers (TR)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	TR (% GDP)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	18.9	1.00	92.9 ; -3.2	-0.48	-0.74	-0.04	0.43	0.45
2010	14.3	1.03	80.4 ; 1.2				.	
2015	11.0	1.00	51.0 ; 5.4			Sum of % dev. in RELU		
2050	18.9	0.97	-37.9 ; -0.3			-0.38		

Table A.8 Simulation results for Italy (Cont'd)

Case 5. Adjustment through the employment rates of mature workers aged 25-54 and of older workers aged 55-64

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Eta_25-54 ; Eta_55-64 (%)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	70.1 ; 28.9	1.00	92.9 ; -3.2	0.31	0.80	0.24	0.83	0.89
2010	83.6 ; 48.1	0.85	62.1 ; 1.8					
2015	99.7 ; 80.2	0.81	23.4 ; 6.0			Sum of % dev. in RELU		
2050	99.7 ; 80.2	0.81	-22.2 ; -2.9			3.07		
	OECD limits: 82.0 ; 56.0							

Case 6. Adjustment through aggregate hours worked per year (H)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	H	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	1599	1.00	92.9 ; -3.2	0.32	0.81	0.20	0.72	0.79
2010	1993	0.83	59.4 ; 2.3					
2015	2483	0.82	19.5 ; 6.4			Sum of % dev. in RELU		
2050	2483	0.80	-23.1 ; -2.7			2.84		

Case 7. A spending-based Stockholm Agenda: adjustment through employment rates (Etas), social protection transfers (TR), and public consumption (CG), health care and education

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	_25-54 ; _55-64 ; TR ; CG ; He ; Ed	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	70.1 ; 28.9 ; 18.9 ; 13.1 ; 6.6 ; 4.8	1.00	92.9 ; -3.2	0.02	0.05	0.08	0.43	0.42
2010	75.1 ; 35.5 ; 17.1 ; 11.5 ; 6.1 ; 4.2	0.99	71.3 ; 2.0					
2015	80.5 ; 43.6 ; 15.7 ; 10.1 ; 5.7 ; 3.6	0.96	33.1 ; 7.0			Sum of % dev. in RELU		
2050	80.5 ; 43.6 ; 26.9 ; 10.1 ; 7.8 ; 4.0	0.95	-37.1 ; -2.1			1.00		

Case 8. A tax-based Stockholm Agenda: adjustment through employment rates (Etas), social protection transfers (TR), and consumption taxes (Tau_C)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	_25-54 ; _55-64 ; TR ; Tau_C	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	70.1 ; 28.9 ; 18.9 ; 17.1	1.00	92.9 ; -3.2	0.04	0.12	0.13	0.43	0.39
2010	75.1 ; 35.5 ; 17.1 ; 20.1	0.93	72.3 ; 1.7					
2015	80.5 ; 43.6 ; 15.7 ; 23.7	0.91	35.2 ; 6.8			Sum of % dev. in RELU		
2050	80.5 ; 43.6 ; 26.9 ; 23.7	0.89	-35.8 ; -2.0			1.11		

Table A.9 Simulation results for the Netherlands (adjustment from 2006 to 2015)

Case 1. Adjustment through labor taxes and social security contributions

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Tau_L (%)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	31.9	1.00	42.0 ; -1.8	0.09	0.14	-0.02	0.08	0.09
2010	36.6	1.00	37.7 ; 0.0					
2015	42.0	1.00	24.7 ; 2.6			Sum of % dev. in RELU		
2050	42.0	1.00	22.6 ; -2.3			0.38		

Case 2. Adjustment through consumption taxes

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Tau_C (%)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	24.2	1.00	42.0 ; -1.8	0.05	-0.05	-0.11	-0.10	-0.14
2010	28.4	0.96	37.7 ; -0.1					
2015	33.4	0.96	25.9 ; 2.3			Sum of % dev. in RELU		
2050	33.4	0.96	21.9 ; -2.1			-0.35		

Case 3. Adjustment through public consumption, general government subsidies, and public investment (CG), health care (He) and education (Ed)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	CG, He, Ed (% GDP)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	17.8 ; 4.6 ; 4.9	1.00	42.0 ; -1.8	0.04	-0.10	-0.20	-0.21	-0.25
2010	15.5 ; 4.6 ; 4.7	1.04	35.5 ; 0.6					
2015	13.4 ; 4.5 ; 4.4	1.04	21.2 ; 2.7			Sum of % dev. in RELU		
2050	13.4 ; 6.0 ; 4.5	1.04	18.1 ; -2.0			-0.72		

Case 4. Adjustment through social protection transfers (TR)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	TR (% GDP)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	18.0	1.00	42.0 ; -1.8	-0.12	-0.18	-0.04	0.04	0.05
2010	15.8	1.00	38.0 ; -0.1				.	
2015	14.4	0.99	27.2 ; 1.8			Sum of % dev. in RELU		
2050	17.7	0.98	22.3 ; -2.0			-0.25		

Table A.9 Simulation results for the Netherlands (Cont'd)

Case 5. Adjustment through the employment rates of mature workers aged 25-54 and of older workers aged 55-64

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Eta_25-54 ; Eta_55-64 (%)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	82.8 ; 42.3	1.00	42.0 ; -1.8	0.16	0.45	0.17	0.29	0.34
2010	89.8 ; 53.8	0.91	31.5 ; 0.3					
2015	97.5 ; 68.5	0.90	18.0 ; 1.8			Sum of % dev. in RELU		
2050	97.5 ; 68.5	0.90	28.6 ; -2.8			1.41		
	OECD limits: 89.7 ; 78.0							

Case 6. Adjustment through aggregate hours worked per year (H)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	H	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	1338	1.00	42.0 ; -1.8	0.16	0.46	0.11	0.09	0.14
2010	1499	0.90	31.1 ; 0.4					
2015	1681	0.90	17.2 ; 1.9			Sum of % dev. in RELU		
2050	1681	0.90	26.1 ; -2.5			0.96		

Case 7. A spending-based Stockholm Agenda: adjustment through employment rates (Etas), social protection transfers (TR), and public consumption (CG), health care and education

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	_25-54 ; _55-64 ; TR ; CG ; He ; Ed	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	82.8 ; 42.3 ; 18.0 ; 17.8 ; 4.6 ; 4.9	1.00	42.0 ; -1.8	0.04	0.08	0.02	0.07	0.08
2010	85.3 ; 46.2 ; 17.1 ; 17.1 ; 4.6 ; 4.8	0.98	35.0 ; 0.2					
2015	87.9 ; 50.5 ; 16.7 ; 16.4 ; 4.5 ; 4.5	0.97	22.2 ; 2.1			Sum of % dev. in RELU		
2050	87.9 ; 50.5 ; 20.5 ; 16.4 ; 5.9 ; 4.6	0.97	22.7 ; -2.2			0.29		

Case 8. A tax-based Stockholm Agenda: adjustment through employment rates (Etas), social protection transfers (TR), and consumption taxes (Tau_C)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	_25-54 ; _55-64 ; TR ; Tau_C	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	82.8 ; 42.3 ; 18.0 ; 24.2	1.00	42.0 ; -1.8	0.04	0.09	0.03	0.10	0.11
2010	85.3 ; 46.2 ; 17.1 ; 25.7	0.96	35.3 ; 0.1					
2015	87.9 ; 50.5 ; 16.7 ; 27.3	0.95	22.9 ; 2.0			Sum of % dev. in RELU		
2050	87.9 ; 50.5 ; 20.5 ; 27.3	0.95	24.4 ; -2.3			0.37		

Table A.10 Simulation results for Portugal (adjustment from 2006 to 2015)

Case 1. Adjustment through labor taxes and social security contributions

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Tau_L (%)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	33.7	1.00	57.7 ; -2.8	2.04	0.85	0.08	0.36	0.41
2010	40.7	0.98	50.2 ; 0.0					
2015	49.2	0.98	29.8 ; 3.7			Sum of % dev. in RELU		
2050	49.2	0.98	-12.4 ; -1.0			3.74		

Case 2. Adjustment through consumption taxes

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Tau_C (%)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	20.1	1.00	57.7 ; -2.8	1.93	0.43	-0.10	-0.29	-0.67
2010	24.6	0.94	49.0 ; 0.2					
2015	30.2	0.94	29.4 ; 3.4			Sum of % dev. in RELU		
2050	30.2	0.93	-13.0 ; -0.8			1.30		

Case 3. Adjustment through public consumption, general government subsidies, and public investment (CG), health care (He) and education (Ed)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	CG, He, Ed (% GDP)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	15.2 ; 6.9 ; 6.6	1.00	57.7 ; -2.8	1.96	0.51	-0.03	0.07	0.03
2010	12.8 ; 6.6 ; 6.0	1.09	47.1 ; 0.8					
2015	10.9 ; 6.4 ; 5.8	1.09	25.4 ; 3.8			Sum of % dev. in RELU		
2050	10.9 ; 8.4 ; 6.1	1.08	-15.4 ; -0.8			2.54		

Case 4. Adjustment through social protection transfers (TR)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	TR (% GDP)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	14.0	1.00	57.7 ; -2.8	0.53	-0.71	-0.19	0.26	0.29
2010	11.1	1.02	50.3 ; -0.1				.	
2015	8.9	1.00	33.7 ; 2.3			Sum of % dev. in RELU		
2050	12.3	0.99	-7.3 ; -0.6			0.18		

Table A.10 Simulation results for Portugal (Cont'd)

Case 5. Adjustment through the employment rates of mature workers aged 25-54 and of older workers aged 55-64

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Eta_25-54 ; Eta_55-64 (%)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	81.6 ; 50.9	1.00	57.7 ; -2.8	1.79	1.11	0.55	0.79	0.86
2010	90.6 ; 69.3	0.92	41.7 ; 0.4					
2015	100.6 ; 94.3	0.91	21.4 ; 2.5			Sum of % dev. in RELU		
2050	100.6 ; 94.3	0.91	-2.1 ; -1.4			5.10		
	OECD limits: 87.7 ; 79.0							

Case 6. Adjustment through aggregate hours worked per year (H)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	H	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	1697	1.00	57.7 ; -2.8	1.78	1.13	0.56	0.73	0.80
2010	1939	0.91	40.8 ; 0.5					
2015	2215	0.91	20.1 ; 2.7			Sum of % dev. in RELU		
2050	2215	0.91	-1.3 ; -1.3			5.00		

Case 7. A spending-based Stockholm Agenda: adjustment through employment rates (Etas), social protection transfers (TR), and public consumption (CG), health care and education

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	_25-54 ; _55-64 ; TR ; CG ; He ; Ed	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	81.6 ; 50.9 ; 14.0 ; 15.2 ; 6.9 ; 6.6	1.00	57.7 ; -2.8	1.55	0.44	0.22	0.45	0.47
2010	84.8 ; 57.1 ; 12.7 ; 14.5 ; 6.6 ; 6.1	1.01	46.3 ; 0.3					
2015	88.2 ; 64.1 ; 11.7 ; 13.8 ; 6.3 ; 5.9	1.00	26.8 ; 2.8			Sum of % dev. in RELU		
2050	88.2 ; 64.1 ; 16.1 ; 13.8 ; 8.3 ; 6.3	0.99	-8.0 ; -1.0			3.13		

Case 8. A tax-based Stockholm Agenda: adjustment through employment rates (Etas), social protection transfers (TR), and consumption taxes (Tau_C)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	_25-54 ; _55-64 ; TR ; Tau_C	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	81.6 ; 50.9 ; 14.0 ; 20.1	1.00	57.7 ; -2.8	1.53	0.40	0.19	0.33	0.26
2010	84.8 ; 57.1 ; 12.7 ; 21.7	0.96	46.5 ; 0.2					
2015	88.2 ; 64.1 ; 11.7 ; 23.4	0.95	27.2 ; 2.7			Sum of % dev. in RELU		
2050	88.2 ; 64.1 ; 16.1 ; 23.4	0.95	-7.3 ; -1.0			2.71		

Table A.11 Simulation results for Spain (adjustment from 2006 to 2015)

Case 1. Adjustment through labor taxes and social security contributions

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Tau_L (%)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	30.0	1.00	32.5 ; 0.9	0.11	0.13	-0.02	0.09	0.07
2010	32.9	1.00	23.4 ; 2.0					
2015	39.7	1.00	7.5 ; 4.0			Sum of % dev. in RELU		
2050	39.7	1.00	11.4 ; -6.2			0.38		

Case 2. Adjustment through consumption taxes

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Tau_C (%)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	16.3	1.00	32.5 ; 0.9	0.09	0.04	-0.07	-0.07	-0.15
2010	18.4	0.98	23.2 ; 2.0					
2015	20.9	0.98	2.8 ; 4.5			Sum of % dev. in RELU		
2050	20.9	0.98	10.8 ; -6.0			-0.16		

Case 3. Adjustment through public consumption, general government subsidies, and public investment (CG), health care (He) and education (Ed)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	CG, He, Ed (% GDP)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	14.4 ; 5.3 ; 3.9	1.00	32.5 ; 0.9	0.08	0.00	-0.10	-0.07	-0.11
2010	13.2 ; 5.6 ; 3.7	1.02	22.6 ; 2.1					
2015	12.0 ; 5.5 ; 3.4	1.02	1.7 ; 4.5			Sum of % dev. in RELU		
2050	12.0 ; 9.7 ; 3.7	1.02	10.5 ; -6.0			-0.20		

Case 4. Adjustment through social protection transfers (TR)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	TR (% GDP)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	13.2	1.00	32.5 ; 0.9	-0.07	-0.11	-0.04	0.06	0.04
2010	12.7	1.00	23.7 ; 1.8				.	
2015	11.5	1.00	4.8 ; 4.0			Sum of % dev. in RELU		
2050	17.1	0.99	10.3 ; -5.4			-0.12		

Table A.11 Simulation results for Spain (Cont'd)

Case 5. Adjustment through the employment rates of mature workers aged 25-54 and of older workers aged 55-64

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Eta_25-54 ; Eta_55-64 (%)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	70.1 ; 39.7	1.00	32.5 ; 0.9	0.18	0.37	0.21	0.28	0.28
2010	73.6 ; 45.8	0.96	20.8 ; 2.0					
2015	77.2 ; 52.8	0.95	1.8 ; 3.8			Sum of % dev. in RELU		
2050	77.2 ; 52.8	0.94	13.0 ; -5.7			1.32		
	OECD limits: 80.0 ; 75.0							

Case 6. Adjustment through aggregate hours worked per year (H)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	H	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	1664	1.00	32.5 ; 0.9	0.18	0.37	0.18	0.23	0.24
2010	1772	0.95	21.3 ; 2.0					
2015	1916	0.94	1.7 ; 3.9			Sum of % dev. in RELU		
2050	1916	0.94	13.4 ; -5.7			1.20		

Case 7. A spending-based Stockholm Agenda: adjustment through employment rates (Etas), social protection transfers (TR), and public consumption (CG), health care and education

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	_25-54 ; _55-64 ; TR ; CG ; He ; Ed	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	70.1 ; 39.7 ; 13.2 ; 14.4 ; 5.3 ; 3.9	1.00	32.5 ; 0.9	0.07	0.10	0.04	0.10	0.08
2010	71.3 ; 41.8 ; 13.4 ; 14.0 ; 5.6 ; 3.7	0.99	22.4 ; 2.0					
2015	72.5 ; 43.9 ; 12.8 ; 13.6 ; 5.5 ; 3.4	0.98	2.8 ; 4.1			Sum of % dev. in RELU		
2050	72.5 ; 43.9 ; 18.9 ; 13.6 ; 9.6 ; 3.8	0.98	11.2 ; -5.7			0.39		

Case 8. A tax-based Stockholm Agenda: adjustment through employment rates (Etas), social protection transfers (TR), and consumption taxes (Tau_C)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	_25-54 ; _55-64 ; TR ; Tau_C	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	70.1 ; 39.7 ; 13.2 ; 16.3	1.00	32.5 ; 0.9	0.07	0.11	0.05	0.10	0.07
2010	71.3 ; 41.8 ; 13.4 ; 17.0	0.98	22.4 ; 1.9					
2015	72.5 ; 43.9 ; 12.8 ; 17.8	0.97	2.9 ; 4.1			Sum of % dev. in RELU		
2050	72.5 ; 43.9 ; 18.9 ; 17.8	0.97	11.5 ; -5.7			0.40		

Table A.12 Simulation results for Sweden (adjustment from 2006 to 2015)

Case 1. Adjustment through labor taxes and social security contributions

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Tau_L (%)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	46.6	1.00	3.3 ; -0.2	0.04	0.05	-0.01	0.03	0.03
2010	48.6	1.00	-1.0 ; 1.1					
2015	50.7	1.00	-9.0 ; 2.2			Sum of % dev. in RELU		
2050	50.7	1.00	34.9 ; -4.9			0.14		

Case 2. Adjustment through consumption taxes

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Tau_C (%)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	30.6	1.00	3.3 ; -0.2	0.02	-0.02	-0.05	-0.06	-0.07
2010	32.3	0.98	-1.0 ; 1.1					
2015	35.2	0.98	-8.7 ; 2.1			Sum of % dev. in RELU		
2050	35.2	0.98	36.4 ; -5.0			-0.18		

Case 3. Adjustment through public consumption, general government subsidies, and public investment (CG), health care (He) and education (Ed)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	CG, He, Ed (% GDP)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	18.7 ; 7.1 ; 7.5	1.00	3.3 ; -0.2	0.01	-0.06	-0.11	-0.12	-0.14
2010	17.8 ; 7.2 ; 7.1	1.02	-1.7 ; 1.3					
2015	16.8 ; 7.3 ; 6.5	1.02	-10.1 ; 2.3			Sum of % dev. in RELU		
2050	16.8 ; 9.3 ; 6.6	1.02	31.9 ; -4.7			-0.42		

Case 4. Adjustment through social protection transfers (TR)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	TR (% GDP)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	24.1	1.00	3.3 ; -0.2	-0.03	-0.04	-0.01	0.02	0.02
2010	23.6	1.00	-0.7 ; 1.0				.	
2015	23.2	1.00	-7.9 ; 2.0			Sum of % dev. in RELU		
2050	26.4	0.99	37.6 ; -5.0			-0.04		

Table A.12 Simulation results for Sweden (Cont'd)

Case 5. Adjustment through the employment rates of mature workers aged 25-54 and of older workers aged 55-64

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Eta_25-54 ; Eta_55-64 (%)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	84.1 ; 68.0	1.00	3.3 ; -0.2	0.07	0.15	0.05	0.12	0.13
2010	86.3 ; 73.5	0.97	-1.7 ; 1.2					
2015	88.6 ; 79.5	0.96	-8.6 ; 1.9			Sum of % dev. in RELU		
2050	88.6 ; 79.5	0.96	39.3 ; -5.0			0.52		
	OECD limits: 85.9 ; 72.0							

Case 6. Adjustment through aggregate hours worked per year (H)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	H	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	1581	1.00	3.3 ; -0.2	0.07	0.16	0.04	0.10	0.11
2010	1643	0.96	-1.9 ; 1.2					
2015	1708	0.96	-9.1 ; 2.0			Sum of % dev. in RELU		
2050	1708	0.96	36.0 ; -4.9			0.48		

Case 7. A spending-based Stockholm Agenda: adjustment through employment rates (Etas), social protection transfers (TR), and public consumption (CG), health care and education

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	_25-54 ; _55-64 ; TR ; CG ; He ; Ed	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	84.1 ; 68.0 ; 24.1 ; 18.7 ; 7.1 ; 7.5	1.00	3.3 ; -0.2	0.02	0.02	-0.02	0.01	0.01
2010	84.9 ; 69.9 ; 24.2 ; 18.4 ; 7.2 ; 7.1	0.99	-1.3 ; 1.1					
2015	85.6 ; 71.7 ; 24.3 ; 18.1 ; 7.3 ; 6.5	0.99	-8.8 ; 2.0			Sum of % dev. in RELU		
2050	85.6 ; 71.7 ; 27.6 ; 18.1 ; 9.2 ; 6.7	0.99	36.3 ; -4.9			0.04		

Case 8. A tax-based Stockholm Agenda: adjustment through employment rates (Etas), social protection transfers (TR), and consumption taxes (Tau_C)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	_25-54 ; _55-64 ; TR ; Tau_C	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	84.1 ; 68.0 ; 24.1 ; 30.6	1.00	3.3 ; -0.2	0.02	0.03	0.00	0.03	0.03
2010	84.9 ; 69.9 ; 24.2 ; 31.4	0.98	-1.2 ; 1.1					
2015	85.6 ; 71.7 ; 24.3 ; 32.1	0.98	-8.5 ; 2.0			Sum of % dev. in RELU		
2050	85.6 ; 71.7 ; 27.6 ; 32.1	0.98	37.8 ; -5.0			0.11		

Table A.13 Simulation results for the United Kingdom (adjustment from 2006 to 2015)

Case 1. Adjustment through labor taxes and social security contributions

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Tau_L (%)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	24.6	1.00	33.5 ; -1.8	0.08	0.15	-0.01	0.05	0.05
2010	27.6	1.00	32.0 ; -0.3					
2015	30.9	1.00	23.1 ; 1.6			Sum of % dev. in RELU		
2050	30.9	1.00	36.7 ; -3.8			0.32		

Case 2. Adjustment through consumption taxes

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Tau_C (%)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	21.3	1.00	33.5 ; -1.8	0.04	-0.12	-0.16	-0.12	-0.16
2010	23.6	0.96	31.7 ; -0.3					
2015	26.1	0.96	23.6 ; 1.3			Sum of % dev. in RELU		
2050	26.1	0.96	41.1. ; -4.0			-0.52		

Case 3. Adjustment through public consumption, general government subsidies, and public investment (CG), health care (He) and education (Ed)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	CG, He, Ed (% GDP)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	12.9 ; 6.4 ; 4.9	1.00	33.5 ; -1.8	0.05	-0.01	-0.11	-0.13	-0.15
2010	11.7 ; 6.2 ; 4.6	1.03	30.9 ; 1.6					
2015	10.5 ; 5.2 ; 4.2	1.03	21.4 ; 1.6			Sum of % dev. in RELU		
2050	10.5 ; 8.0 ; 4.3	1.03	32.0 ; -3.5			-0.35		

Case 4. Adjustment through social protection transfers (TR)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	TR (% GDP)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	15.7	1.00	33.5 ; -1.8	-0.09	-0.17	-0.05	0.03	0.03
2010	14.3	0.99	32.7 ; -0.5				.	
2015	13.3	0.99	25.6 ; 1.0			Sum of % dev. in RELU		
2050	17.0	0.98	46.8 ; -4.2			-0.25		

Table A.13 Simulation results for the United Kingdom (Cont'd)

Case 5. Adjustment through the employment rates of mature workers aged 25-54 and of older workers aged 55-64

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Eta_25-54 ; Eta_55-64 (%)	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	80.6 ; 53.5	1.00	33.5 ; -1.8	0.15	0.33	0.15	0.19	0.21
2010	85.3 ; 63.3	0.95	28.3 ; -0.1					
2015	90.3 ; 74.9	0.94	19.1 ; 1.1			Sum of % dev. in RELU		
2050	90.3 ; 74.9	0.94	43.0 ; -4.1			1.03		
	OECD limits: 85.6 ; 63.0							

Case 6. Adjustment through aggregate hours worked per year (H)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	H	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	1692	1.00	33.5 ; -1.8	0.16	0.35	0.15	0.12	0.14
2010	1823	0.94	27.9 ; 0.0					
2015	1964	0.93	18.3 ; 1.2			Sum of % dev. in RELU		
2050	1964	0.93	40.2 ; -3.9			0.92		

Case 7. A spending-based Stockholm Agenda: adjustment through employment rates (Etas), social protection transfers (TR), and public consumption (CG), health care and education

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	_25-54 ; _55-64 ; TR ; CG ; He ; Ed	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	80.6 ; 53.5 ; 15.7 ; 12.9 ; 6.4 ; 4.9	1.00	33.5 ; -1.8	0.04	0.07	0.02	0.05	0.05
2010	82.2 ; 56.8 ; 15.1 ; 12.5 ; 6.2 ; 4.6	0.98	30.6 ; -0.2					
2015	83.9 ; 60.3 ; 14.8 ; 12.1 ; 6.2 ; 4.3	0.98	22.1 ; 1.2			Sum of % dev. in RELU		
2050	83.9 ; 60.3 ; 18.8 ; 12.1 ; 8.0 ; 4.4	0.98	40.7 ; -3.9			0.23		

Case 8. A tax-based Stockholm Agenda: adjustment through employment rates (Etas), social protection transfers (TR), and consumption taxes (Tau_C)

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	_25-54 ; _55-64 ; TR ; Tau_C	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	80.6 ; 53.5 ; 15.7 ; 21.3	1.00	33.5 ; -1.8	0.04	0.02	0.00	0.05	0.04
2010	82.2 ; 56.8 ; 15.1 ; 22.1	0.99	30.8 ; -0.3					
2015	83.9 ; 60.3 ; 14.8 ; 22.9	0.96	22.5 ; 1.1			Sum of % dev. in RELU		
2050	83.9 ; 60.3 ; 18.8 ; 22.9	0.96	43.5 ; -4.1			0.15		

Table A.14 Simulation results for Case 9, a country-specific welfare-enhanced Stockholm Agenda (adjustment from 2006 to 2015)

Austria - Adjustment through higher employment rates (to the OECD limits) and through social protection transfers to close the fiscal gap

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Eta_25-54 ; Eta_55-64 ; TR	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	83.9 ; 29.7 ; 21.9	1.00	41.7 ; -0.5	0.07	0.20	0.17	0.39	0.41
2010	87.0 ; 37.8 ; 20.0	0.95	25.4 ; 2.8					
2015	90.2 ; 48.0 ; 17.9	0.92	-2.9 ; 6.3		Sum of % dev. in RELU		148% better than the	
2050	90.2 ; 48.0 ; 27.7	0.92	-71.7 ; 0.0		1.24		best Stockholm Agenda	

Belgium - Adjustment through higher employment rates ages 25-54 (to the OECD limits) and through higher employment rates ages 55-64 to close the fiscal gap

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Eta_25-54 ; Eta_55-64	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	76.5 ; 26.6	1.00	88.7 ; 0.3	0.05	0.11	0.04	0.12	0.14
2010	79.0 ; 28.4	0.97	66.7 ; 2.0					
2015	81.5 ; 30.2	0.97	42.5 ; 3.4		Sum of % dev. in RELU		207% better than the	
2050	81.5 ; 30.2	0.97	14.5 ; -1.5		0.46		best Stockholm Agenda	

Denmark - Adjustment through higher employment rates (to the OECD limits) and through social protection transfers to close the fiscal gap, *or* just through more hours worked

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Eta_25-54 ; Eta_55-64 ; TR	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	84.1 ; 57.9 ; 25.2	1.00	0.2 ; 2.1	0.04	0.09	0.04	0.10	0.11
2010	85.6 ; 64.3 ; 25.3	0.97	-11.2 ; 2.5					
2015	87.1 ; 71.5 ; 25.5	0.96	-21.4 ; 2.9		Sum of % dev. in RELU		322% better than the	
2050	87.1 ; 71.5 ; 29.5	0.96	36.1 ; -4.7		0.38		best Stockholm Agenda	

Finland - Adjustment through higher employment rates ages 25-54 (to the OECD limits) and through higher employment rates ages 55-64 to close the fiscal gap

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Eta_25-54 ; Eta_55-64	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	81.6 ; 47.8	1.00	-42.3 ; 4.6	0.11	0.18	0.12	0.20	0.22
2010	82.3 ; 57.0	0.95	-53.2 ; 4.2					
2015	83.0 ; 67.9	0.95	-58.1 ; 3.2		Sum of % dev. in RELU		361% better than the	
2050	83.0 ; 67.9	0.95	53.0 ; -7.0		0.83		best Stockholm Agenda	

Table A.14 Simulation results for Case 9, a country-specific welfare-enhanced Stockholm Agenda (cont'd)

France - Adjustment through higher employment rates (to the OECD limits) and through social protection transfers to close the fiscal gap

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Eta_25-54 ; Eta_55-64 ; TR	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	79.5 ; 34.7 ; 20.7	1.00	44.4 ; -3.1	0.18	0.41	0.33	0.57	0.62
2010	83.0 ; 45.6 ; 18.6	0.93	38.3 ; 0.1					
2015	86.6 ; 60.0 ; 17.4	0.92	24.3 ; 2.2		Sum of % dev. in RELU		148% better than the	
2050	86.6 ; 60.0 ; 22.0	0.92	34.8 ; -3.4		2.11		best Stockholm Agenda	

Germany - Adjustment through higher employment rates (to the OECD limits) and through social protection transfers to close the fiscal gap

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Eta_25-54 ; Eta_55-64 ; TR	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	78.8 ; 38.8 ; 22.9	1.00	57.4 ; -4.7	0.02	0.06	0.17	0.45	0.49
2010	82.1 ; 52.1 ; 18.5	0.96	55.5 ; -0.3					
2015	85.6 ; 70.0 ; 15.1	0.92	34.7 ; 4.0		Sum of % dev. in RELU		43% better than the	
2050	85.6 ; 70.0 ; 20.4	0.92	-8.6 ; -0.7		1.19		best Stockholm Agenda	

Ireland - Adjustment through higher employment rates (to the OECD limits) and through social protection transfers to close the fiscal gap

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Eta_25-54 ; Eta_55-64 ; TR	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	76.0 ; 47.1 ; 9.2	1.00	29.9 ; -1.5	0.15	0.32	0.06	0.18	0.20
2010	79.4 ; 62.5 ; 8.5	0.93	21.3 ; -0.1					
2015	83.0 ; 83.0 ; 8.0	0.92	12.3 ; 0.7		Sum of % dev. in RELU		279% better than the	
2050	83.0 ; 83.0 ; 10.7	0.91	24.1 ; -3.6		0.91		best Stockholm Agenda	

Italy - Adjustment through higher employment rates (to the OECD limits) and through social protection transfers to close the fiscal gap

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Eta_25-54 ; Eta_55-64 ; TR	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	70.1 ; 28.9 ; 18.9	1.00	92.9 ; -3.2	-0.06	0.11	0.28	0.74	0.78
2010	75.8 ; 40.2 ; 15.6	0.94	71.1 ; 1.4					
2015	82.0 ; 56.0 ; 13.1	0.91	36.1 ; 5.7		Sum of % dev. in RELU		67% better than the	
2050	82.0 ; 56.0 ; 22.3	0.89	-29.6 ; -1.8		1.85		best Stockholm Agenda	

Table A.14 Simulation results for Case 9, a country-specific welfare-enhanced Stockholm Agenda (cont'd)

The Netherlands - Adjustment through higher employment rates (to the OECD limits) and through social protection transfers to close the fiscal gap

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Eta_25-54 ; Eta_55-64 ; TR	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	82.8 ; 42.3 ; 18.0	1.00	42.0 ; -1.8	0.13	0.39	0.21	0.33	0.37
2010	86.2 ; 57.4 ; 16.8	0.93	32.7 ; 0.2					
2015	89.7 ; 78.0 ; 15.9	0.91	19.6 ; 1.8		Sum of % dev. in RELU		286% better than the	
2050	89.7 ; 78.0 ; 19.5	0.92	29.5 ; -2.8		1.43		best Stockholm Agenda	

Portugal - Adjustment through higher employment rates (OECD limits) and through public consump., gen. gov't subsidies, public inv., health care and education to close the fiscal gap

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Eta_25-54 ; Eta_55-64 ; CG, He, Ed	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	81.6 ; 50.9 ; 15.2 ; 6.9 ; 6.6	1.00	57.7 ; -2.8	1.90	0.81	0.32	0.48	0.49
2010	84.6 ; 63.4 ; 14.0 ; 6.4 ; 5.9	1.01	45.0 ; 0.4					
2015	87.7 ; 79.0 ; 12.9 ; 6.0 ; 5.6	1.00	24.4 ; 3.0		Sum of % dev. in RELU		28% better than the	
2050	87.7 ; 79.0 ; 12.9 ; 7.9 ; 5.9	0.99	-9.0 ; -1.1		4.00		best Stockholm Agenda	

Spain - Adjustment just through higher employment rates (*under* the OECD limits) to close the fiscal gap

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Eta_25-54 ; Eta_55-64	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	70.1 ; 39.7	1.00	32.5 ; 0.9	0.18	0.37	0.21	0.28	0.28
2010	73.6 ; 45.8	0.96	20.8 ; 2.0					
2015	77.2 ; 52.8	0.95	1.8 ; 3.8		Sum of % dev. in RELU		230% better than the	
2050	77.2 ; 52.8	0.94	13.0 ; -5.7		1.32		best Stockholm Agenda	

Sweden - Adjustment through higher employment rates (to the OECD limits) and through social protection transfers to close the fiscal gap

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Eta_25-54 ; Eta_55-64 ; TR	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	84.1 ; 68.0 ; 24.1	1.00	3.3 ; -0.2	0.01	0.03	0.02	0.06	0.07
2010	85.0 ; 70.0 ; 23.8	0.99	-1.1 ; 1.1					
2015	85.9 ; 72.0 ; 23.5	0.98	-8.2 ; 2.0		Sum of % dev. in RELU		73% better than the	
2050	85.9 ; 72.0 ; 26.7	0.98	38.1 ; -5.0		0.19		best Stockholm Agenda	

Table A.14 Simulation results for Case 9, a country-specific welfare-enhanced Stockholm Agenda (cont'd)

The United Kingdom - Adjustment through higher employment rates (to the OECD limits) and through social protection transfers to close the fiscal gap

		Per capita consumption	Net debt ; balance	Welfare impact (% dev. in RELU vis-à-vis adj. lump sum taxes) by birth cohort				
	Eta_25-54 ; Eta_55-64 ; TR	(Adj. lump sum taxes = 1)	(% GDP)	1916	1946	1976	2006	2036
2005	80.6 ; 53.5 ; 15.7	1.00	33.5 ; -1.8	0.03	0.09	0.07	0.12	0.13
2010	83.1 ; 58.1 ; 14.7	0.97	30.4 ; -0.3					
2015	85.6 ; 63.0 ; 13.9	0.96	22.2 ; 1.0		Sum of % dev. in RELU		91% better than the	
2050	85.6 ; 63.0 ; 17.7	0.96	44.6 ; -4.1		0.44		best Stockholm Agenda	