

AUGUR

Challenges for Europe in the world in 2030

Project no. SSH-CT-2009-244565

Collaborative Project

SP1-Cooperation

DELIVERABLE 4.3 (WP 4)

Scenario Analysis: Preliminary Results

Title:	Scenario Analysis: Preliminary Results
Work package:	4
Due date of deliverable:	March 2012
Actual submission date:	May 2012
Start date of project:	1st October 2009
Duration:	40 months
Organisation name of lead:	SOAS-CDPR
Contractor of this deliverable:	SOAS
Author (s):	Terry McKinley, Giovanni Cozzi and Jo Michell
With the help of:	–
Nature:	Report

Project co-funded by the European Commission within the Seventh Framework Programme (2007-2013)		
Dissemination Level		
PU	Public	<input type="checkbox"/>
PP	Restricted to other programme participants (including the Commission Services)	<input type="checkbox"/>
RE	Restricted to a group specified by the consortium (including the Commission Services)	<input type="checkbox"/>
CO	Confidential, only for members of the consortium (including the Commission Services)	<input checked="" type="checkbox"/>

ABSTRACT

Deliverable 4.3 continues the research begun in Deliverable 4.2 on the relationship between demographic variables and macroeconomic variables. However, Deliverable 4.3 concentrates on the relationship between the age structure of the population and employment. In doing so, it uses a composite index, called the Economic Dependency Ratio, as a basis to compare trends in the above two variables.

The Economic Dependency Ratio can be disaggregated into two ratios: 1) the ratio of young and elderly dependants to the employed and 2) the ratio of economically inactive and unemployed working-age persons to the employed. The first ratio tracks trends in the age structure of the population while the second ratio tracks trends in employment among the working-age population. The age structure of the population changes relatively slowly, though net migration can affect it in the medium term. In contrast, inactivity rates and unemployment rates can change more quickly and are more responsive to policy measures.

As our focus of attention, we track changes in the Economic Dependency Ratio until 2030 across five main scenarios produced for the AUGUR project by the Cambridge-Alphametrics Model (the CAM). These five scenarios are: 1) the 'Baseline Scenario', 2) 'Reduced Government', 3) 'China-US Intervention', 4) 'Regionalisation', and 5) 'Multipolar Governance'. We carry out this work primarily for the European blocs that are part of the database of the CAM. But we also carry out some related work on the blocs for North Africa and West Asia.

Since the 'Baseline Scenario' represents a 'business-as-usual' trend—i.e., it does not contain any changes in policy or significant exogenous shocks—demographic trends are the main determinants of the trajectory of the Economic Dependency Ratio until 2020. For Europe, this signifies that it will face the serious challenge of increasing ageing of its population (i.e., the growth of the share of the population 65 years of age or older relative to the working-age population).

While employment trends improve under the 'Baseline Scenario', since these improvements are only modest, they do little to counteract the challenge of population ageing. Europe still faces a problem of economic inactivity rates and unemployment rates that are relatively high, particularly in the wake of the global financial crisis.

Generally, the 'Reduced Government' and the 'China-US Intervention' scenarios exacerbate the problem of ageing or do no better than the 'Baseline' scenario. In contrast, both the 'Regionalisation' scenario and the 'Multipolar Governance' scenario do qualitatively better than the 'Baseline' scenario. Both of the latter scenarios generate a significant improvement in employment compared to the 'Baseline'.

Deliverable 4.3 also reports on research on demographic and employment trends in North Africa and West Asia (the NAWA region). These are the two bloc names used by the Cambridge-Alphametrics Model. It finds that the NAWA region faces a qualitatively different demographic challenge than Europe. The NAWA region has a relatively young population, which is putting increasing pressure on national and regional labour markets as they enter the working-age population.

While the working-age population is projected to grow in this region, its employment levels remain relatively low. There are important gender differences in North Africa and West Asia that make its problems distinctive. One of main reasons for the region's relatively low level of employment is that female employment is very low.

In addition, youth unemployment is a major problem. But underlying this problem is a deeper challenge, namely, that economic activity rates among young workers, those between 15 and 24 years of age, are very low. So the profound challenge for North Africa and West Africa is to both significantly raise the economic activity rate and—most importantly, of course—boost the employment rate among young people.

The last section of Deliverable 4.3 uses the CAM to test the impact of an employment-focused fiscal expansion on European blocs. This scenario differs from the other standard scenarios in the AUGUR project. It explicitly sets employment targets for each European bloc for 2030 and uses an expansion of government expenditures in tandem with increases in private investment to achieve these targets. In addition, the scenario targets complementary changes in net government income (to counteract increases in fiscal deficits) and management of real exchange rates (to counteract increases in current-account deficits). The results of the scenario suggest that such employment targets can be met without jeopardizing either fiscal deficits or current-account deficits, and without significantly increasing inflation.

TABLE OF CONTENTS

I. Introduction

- I.1 The Contents of Deliverable 4.3
- I.2 A Review of Deliverables 4.1 and 4.2

II. Demographic and Employment Trends: the Baseline Scenario

- II.1 Introduction
- II.2 Trends in the Elderly Dependency Ratio
- II.3 Trends in the Working-Age Population
- II.4 Definition of the Economic Dependency Ratio
- II.5 Trends in the Economic Dependency Ratio
- II.6 Decomposition of the EDR Trends
- II.7 Highlights of the Results

III. Demographic and Employment Trends: AUGUR's Four Main Scenarios

- III.1 Introduction
- III.2 Elderly and Young Dependency Ratios
- III.3 AUGUR Projections: Economic Dependency Ratio
- III.4 Decomposition of the EDR: Projections of the Underlying Ratios
- III.5 Summary of Results

IV. Demographic and Employment Trends: Analysis of North Africa and West Asia

- IV.1 Demographic Trends
- IV.2 Trends in the Economic Dependency Ratio
- IV.3 Levels of Employment and Activity

V. Initial Policy Implications: An Employment-Focused Economic Recovery for Europe

- V.1 Introduction
- V.2 Employment Targets
- V.3 Supportive Policies
- V.4 Further Scenario Results
- V.5 Summary of the Employment Scenario

VI. Concluding Remarks and Directions of Future Research

VII. References and Data Sources

VIII. Appendix 1

I. INTRODUCTION

I.1 The Contents of Deliverable 4.3

Deliverable 4.3, which continues the research agenda for Work Package #4, deals with 'Scenario Analysis: Preliminary Results'. It is composed of **six major** sections that deal with demographic trends, issues and initial policy implications. The **First Section** is this Introduction and review of past deliverables.

The **Second Section** provides information based on demographic and employment-related trends that are derived from a 'Baseline scenario' produced by the Cambridge-Alphametrics Model (the CAM). In other words, the information is derived from a projection until 2030 that does not introduce any new assumptions, such as major exogenous shocks or policy changes.

The demographic trends relate to projections primarily of the age structure of the population, namely, the proportion of young dependants, elderly dependants and the working-age population in the total population. These trends are determined outside the CAM model by UN projections. The focus of these projections are the five European Blocs, i.e., North Europe, West Europe, East Europe, South Europe and the United Kingdom. For comparison purposes, we also report results for other important blocs or countries in the world, such as the USA, Japan and China.

The employment-related trends center on the use of the Economic Dependency Ratio. This composite index groups together information on elderly dependants, young dependants, the economically inactive, and the unemployed and compares their combined size to the size of the employed population. This index provides a basic barometer of the economic 'sustainability' of a country's future economic trajectory.

The **Third Section** of Deliverable 4.3 extends the analysis provided in the First Section by investigating the impact on the Economic Dependency Ratio of the trends produced by the four major scenarios of the AUGUR project. These four are labeled as Reduced Government, China-US Intervention, Regionalisation and Multipolar Governance. This section concentrates on the impacts on the five European Blocs and adds comparative information for other important blocs or countries in the world.

The **Fourth Section** of Deliverable 4.3 uses the four major scenarios of the AUGUR project to concentrate on trends in the Economic Dependency Ratio for the two blocs of West Asia and North Africa. It pays particular attention to problems of low economic activity rates and low employment among women and among young workers.

The **Fifth Section** of Deliverable 4.3 provides an analysis of the impact of a policy-oriented scenario that assumes an employment-focused fiscal stimulus designed to achieve an economic recovery in all European Blocs (as well as in the USA). The results of this scenario are compared to those for the 'Baseline' scenario, which is a regular feature of the AUGUR research project.

The **Sixth Section** provides concluding remarks on the results produced by the research for Deliverable 4.3 and indicates the directions of future research.

We end this Section I, the Introduction, with a review of the research conducted for **Deliverables 4.1 and 4.2**.

I.2 Review of Deliverables 4.1 and 4.2

Deliverable 4.1

Deliverable 4.1 described the Concepts, Measures and Data Sources for work package #4, 'Development, Demography and Migration'. It pointed out that Work package #4 is closely connected to Work package #1, 'The Macro Model of World Regions' since the major objective of Work package #4 is to incorporate demographic data and specify demographic variables for the CAM global macro model and test their usefulness for framing policy scenarios.

Deliverable 4.1 started with an introduction to the nature and structure of the CAM model of the world economy and explained the general plan for how demographic data would be incorporated into it. The Deliverable then described the current bloc structure of the model, with a special emphasis on differences in population across blocs and individual major countries.

Following this section, the Deliverable gave a description of the main demographic trends characterizing four major emerging economies: Brazil, China, India and South Africa. This focus was considered relevant because SOAS-CDPR is using half of its AUGUR budget to organize researchers from these four countries to contribute to the AUGUR project.

Drawing on expertise from the AUGUR-organized Foresight Committee, the Deliverable also delineated the major demographic trends in the European Union, such as population ageing, the projected absolute decline in total population and the impact of net migration inflows.

The Deliverable described how demographic variables would be incorporated into the CAM model, as part of the larger enterprise of including other major variables in order to deepen our understanding of economic, social and demographic interactions between Europe and the rest of the world. The Deliverable also recounted the major 'Governance Assumptions' that would help structure the entire AUGUR research project and would affect how SOAS planned to model demographic variables and identify relevant policy scenarios.

The Deliverable went into some degree of detail in identifying the list of demographic indicators that the researchers organizing Work package #4 proposed to include in the CAM database and use for modelling demographic trends and their interactions with economic and social trends. The definitions of these indicators and the degree of availability of data for each of them were also provided.

Following this section, the Deliverable provided a description of the major linkages (such as the world markets for primary commodities and energy and the global financial markets) which are at the heart of the CAM model. The Deliverable proposed, tentatively, how international migration might be included as an additional global linkage, though it recognized that data on migration flows and remittances were limited. These major linkages were then related to how policy scenarios would be framed for the CAM model.

The Deliverable ended by describing how a process of trial and error would be used to include demographic variables in the CAM model, specify, where feasible, new equations that focus on demographic trends and test the contribution of these additions to improving the projections and policy scenarios of the model and thereby promote better understanding of the EU's role in the global economy from 2010 until 2030.

Deliverable 4.2

Deliverable 4.2 was composed of three parts. The First Part evaluated the equations for employment and migration currently specified for the CAM model. These are the two equations in the model in which demographic variables have played an important role, either as dependent or independent variables. With regard to the equation for employment growth, econometric exercises for this Deliverable found that the variables for growth of GDP per capita, the size of the working-age population and the urbanisation rate had positive impacts. Life expectancy and the secondary and tertiary enrolment ratios also appear to have had a positive impact. With regard to the equation for the net migration rate, econometric exercises for this Deliverable found that the size of the working-age population had a negative impact and the growth of employment and the lagged net migration rate (past migration patterns) had positive impacts.

The Second Part of Deliverable 4.2 carried out an extensive econometric exercise to determine the impact on macroeconomic variables (GDP per capita growth, the private savings rate, the private investment rate, the budget balance and the current account balance) of changes in demographic variables (the elderly dependency ratio, the ratio of the working-age population to the total population, the urbanisation rate and the net migration rate). The econometrics employed two different methods (a Dynamic Fixed Effects estimator and a Pooled Mean Group estimator) and two different samples (the 18 CAM blocs and a disaggregated sample of 130 countries). The two samples were also disaggregated into rich and poor countries.

The econometric results presented by the Deliverable suggested that the elderly dependency ratio had a significant negative impact on the private savings rate and the growth of GDP per capita. The working-age population ratio had a significant positive effect on the private investment rate and appeared to have a positive impact on the budget balance and the current account balance. The urbanisation rate did not have a consistently significant impact on any macroeconomic variable although it did appear to have a positive effect on the budget balance and the private savings rate for the 18-bloc sample. The net migration rate appeared to have had a positive effect on the private savings rate and the private investment rate and a negative effect on the current account balance (but only for the 130-country sample).

The Third Part of Deliverable 4.2 took these econometric results as a basis to begin conducting—outside the CAM model—some policy experiments on the projected future effects on macroeconomic variables of changes in demographic variables. These experiments took the form of simulations that used parameters derived from the econometric results of the Second Part of this Deliverable. The first set of simulations was based on an equation that projected future trends in the private savings rate on the basis of changes in the growth rate of GDP per capita, the elderly dependency ratio, the working-age population ratio and the net migration rate. These

policy experiments were confined to effects in the nine richer blocs in the CAM model, where population ageing was of particular concern.

The first finding of this exercise was that, due to population ageing, any increases in the net migration rate would have to be unrealistically large in order to overcome the projected falls in private savings in the nine blocs of richer countries. The Deliverable's second finding was that the degree to which 'the retirement age would have to be raised' (in order to enlarge the working-age population and shrink the elderly dependent population) would also have to be unrealistically large.

II. DEMOGRAPHIC AND EMPLOYMENT TRENDS: THE BASELINE SCENARIO

II.1 Introduction

As explained in the Introduction, this **Second Section** deals with demographic and employment-related trends generated by a 'baseline scenario'. It is useful to start with a review of the results for 'the baseline scenario' because it assumes no changes in policy.

The focus of our attention is on Europe disaggregated into five major blocs. In this section, we also examine the trends for the US, Japan and China, mainly for the purposes of comparison. In addition, we will present some initial results for West Asia and the North Africa (WA-NA).

Our initial focus is on the evolution of the age structure of the European population. In particular, we are concerned about the impact of the progressive ageing of the European population. This trend can be represented by a growing proportion of the elderly in the total population, and by an increase in the proportion of the elderly as a ratio to the proportion of those of working age.

When our research is complete and we are writing the Final Report, **Deliverable 4.4** ('Global Development, Demographic Change and Migration'), we hope to be able to adequately assess and recommend various policy options. These could include, for instance, the options of raising the retirement age, encouraging more in-migration of workers, or prioritising gains in employment, particularly among young workers—or a combination of various such options.

II.2 Trends in the Elderly Dependency Ratio

We begin our research for this Deliverable with an examination of the evolution of the Elderly Dependency Ratio—namely, the ratio of the number of elderly to the number of people of working age. **Figures II.1** illustrate that this ratio is projected to increase significantly for all five European blocs as well as for the USA, Japan and even China.

The first figure shows that the elderly dependency ratio is projected to rise most sharply in West Europe (from over 18% in 2011 to almost 26% in 2030). The ensuing figures show that there is an absolute rise of about 6 percentage points in East Europe (from about 15% to about 21%) and an absolute rise of about 4 percentage points in South Europe (from almost 19% to almost 21%). The pattern in North Europe (the Nordic countries) is unusual: the Elderly Dependency Ratio was relatively stable from about 1990 to about 2005 but rose significantly thereafter, increasing from about 17.5% in 2011 to 21.5% in 2030. In the United Kingdom, the Elderly Dependency Ratio rose by about 3.5 percentage points during the same period.

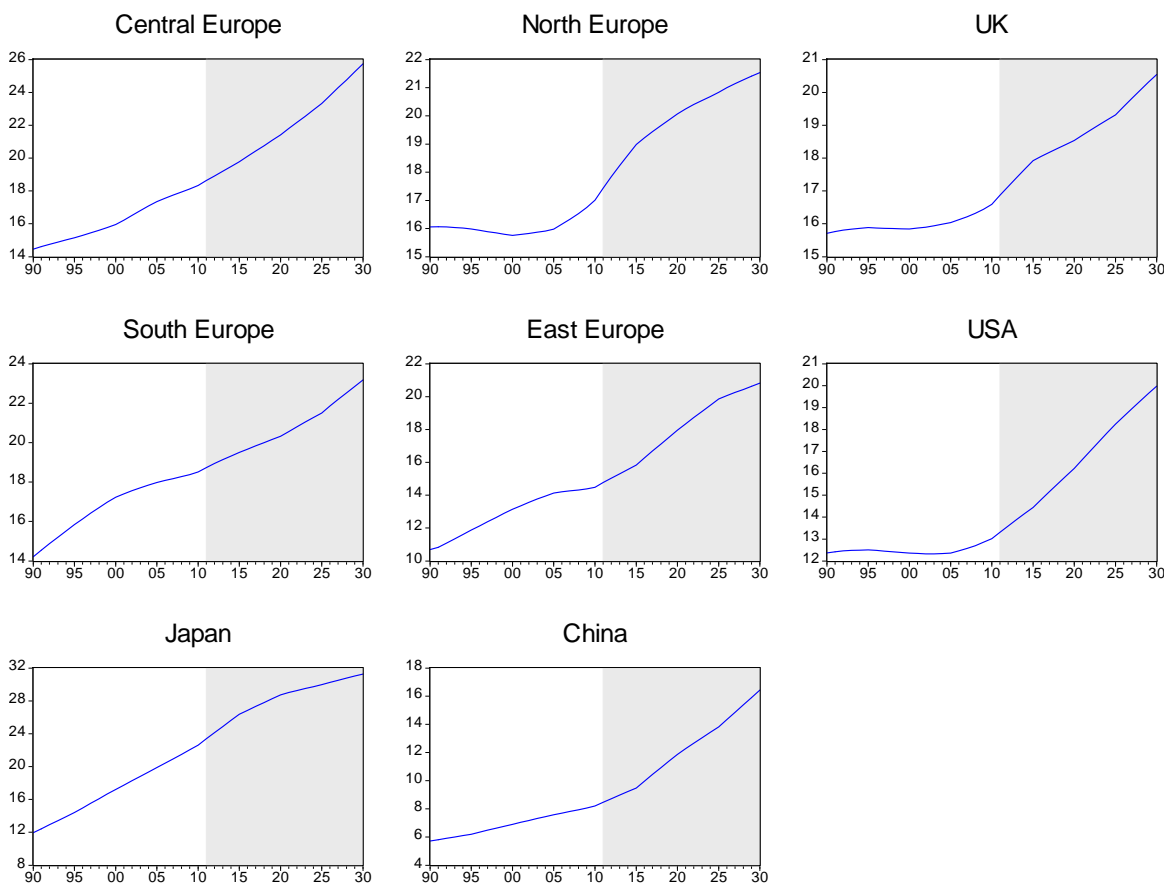
What is noteworthy is that West Europe is projected to have not only the sharpest increase in the Elderly Dependency Ratio (6 percentage points) but also the highest level of this ratio in 2030 (almost 26%).

The last three figures provide the basis for comparison of the trends in Europe with those in three other major countries in the world, i.e., the USA, Japan and China. In all three countries there is a discernible ageing process. The most pronounced is in Japan, where the Elderly Dependency Ratio is projected to rise to almost 32% in 2030—even higher than that in West Europe.

The USA is projected to experience a very sharp rise in the Elderly Dependency Ratio, but from a fairly low base in 2011, i.e., just above 13%. The absolute increase in the USA's ratio by 2030 is almost 7 percentage points.

China is also projected to experience a very sharp rise in this ratio, from over 8% in 2011 to over 16% in 2030, or almost an increase of 8 percentage points.

Figures II.1 Elderly Dependency Ratio, Baseline Scenario



II.3 Trends in the Working-Age Population

We complement our focus on the Elderly Dependency Ratio with an examination of the ratio of the Working-Age Population to the Total Population. In this case, the total population includes young dependants as well as elderly dependants. A decline in this

ratio should be a matter of concern for European policymakers since it is the working-age population that is most likely to be employed and generating income for the dependent young and elderly populations as well as for itself.

A rise in the ratio of the working-age population to the total population could occur for reasons other than a decline in the proportion of elderly dependants. For example, there could be a decline in the proportion of young dependants. Or there could be a significant influx of migrants of working age into a country.

Figures II.2 present results for the ratio of the working-age population to the total population ('working-age ratio' as a shorthand expression) for the same five European blocs and three other major countries as Figures II.1.

The first figure shows that West Europe is projected to suffer from a sharp drop (of almost 7 percentage points) in its 'working-age ratio'. There is also a fairly sharp drop in East Europe between 2011 and 2030. Between 1990 and about 2010 East Europe had enjoyed, in contrast, a sharp rise of 4 percentage points in this ratio.

There is also a projected drop in the 'working-age ratio' for South Europe, but only of less than 2.5 percentage points. There is a drop of similarly moderate magnitude in North Europe, namely, of about 3 percentage points between 2011 and 2030. But during the 1990s and 2000s this ratio had been fairly stable in the Nordic countries.

In the United Kingdom, there had been a rise in the 'working-age ratio' between about 1995 and 2005, but by 2010 this ratio had begun to decline significantly, from about 66% to about 62.5% in 2030.

In summary, it appears that West Europe is likely to face the largest future challenges with respect to a decline in the ratio of the working-age population to the total population. This trend appears to coincide with a notable rise in its Elderly Dependency Ratio, as described above.

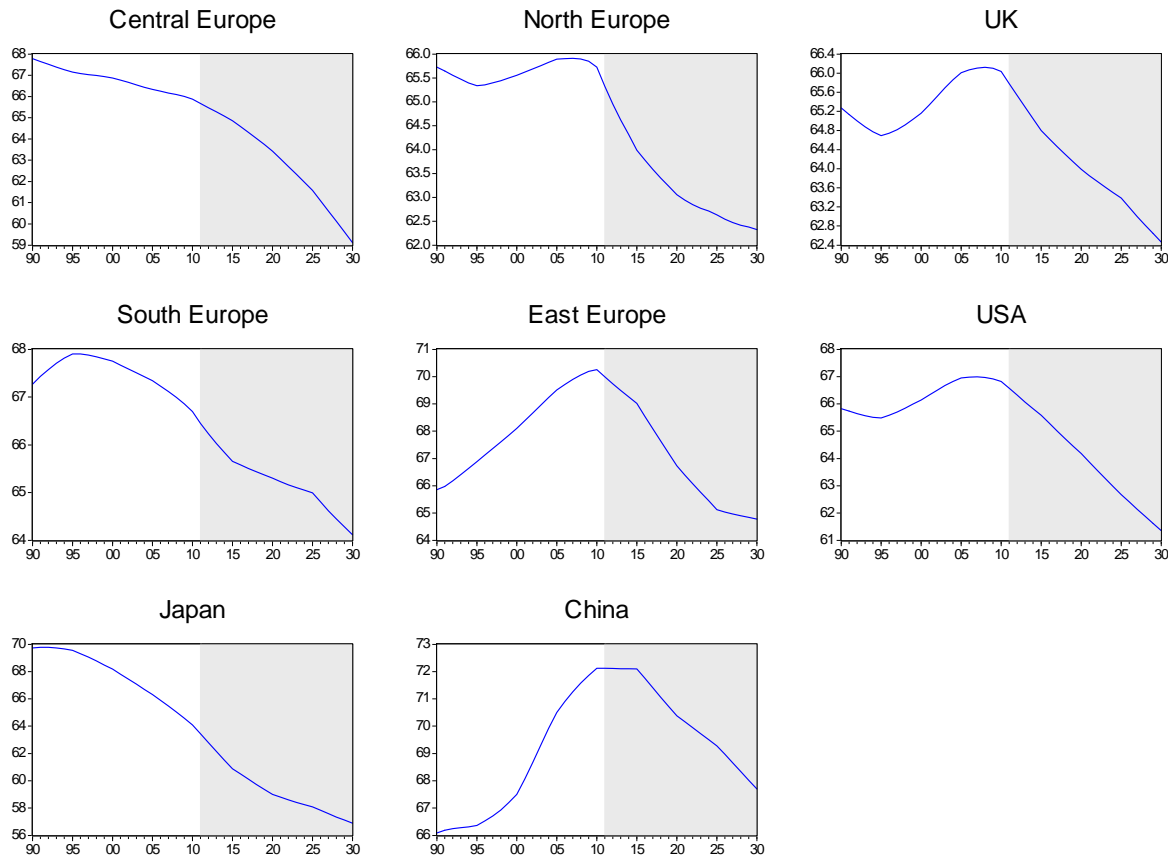
How do these trends in the 'working-age ratio' compare to those in the USA, Japan and China? The USA is projected to exhibit a trend similar to that for the United Kingdom (see the fifth figure). Whereas between about 1995 and about 2005, its 'working-age ratio' had increased modestly (to 67%), after 2010 the projection is for a marked decline, to about 61.5%.

In Japan the 'working-age ratio' has been in notable decline since about 1995 (when it stood at almost 70%), dropping below 64% in 2011 (see the seventh figure). The 'baseline' scenario projects a further decline to about 57% by 2030. This is the lowest level among our eight countries and blocs. Only West Europe is projected to have a similarly low level (i.e., about 59%).

The last figure illustrates both a distinctly different historical trend and projection for China. Between 1990 and about 2010, its 'working-age ratio' rose rapidly from about 66% to about 72%. This ratio is projected to remain stable until about 2015, but then will likely dive to under 68% by 2030. However, this resultant level will still easily exceed those in the seven developed blocs and countries in our sample.

Nevertheless, it is clear that our entire sample of eight blocs and countries will experience a fall in the 'working-age ratio'. The only differences are found in the scale of the fall and the resultant projected level in 2030. In both West Europe and Japan, sharp falls are projected for this ratio and their resultant levels are likely to be the lowest among our sample.

Figures II.2 Working-Age Population, Baseline Scenario



II.4 Definition of the Economic Dependency Ratio

One of the primary aims of our research for the AUGUR project is to link demographic trends, such as ageing, with employment trends. Hence, we are not interested just in trends in the Age Structure of the population in Europe and other blocs and countries. Even if the ratio of the Working-Age Population to the Total Population is rising, for example, there is no guarantee that there will be a corresponding increase in this group's employment or even their economic activity rates (their pursuit of employment).

Hence, we want a broader measure of Dependency that takes into account the prevalence of both **Economic Inactivity Rates** and **Unemployment Rates** among the Working-Age Population and combines these two rates of prevalence with those for youth dependency and elderly dependency. After all, all four of these groups will have to be supported somehow by society at large, and therefore ultimately by those who are employed.

For this reason, we have utilized the **Economic Dependency Ratio** developed by Thomas Palley (see Palley 1991) to help us track trends in all four of the above dependent groups as well as the employed. In fact, the numerator of this ratio additively combines 1) the number of elderly (65 years and older), 2) the number of young people (under 15 years of age), 3) the economically inactive (such as persons

on benefits, the disabled, military personnel and students) and 4) those of working age who are 'economically active' but unemployed. This combined numerator is then taken as a ratio to the number of employed as the denominator. In other words, this is the Ratio of the 'Economically Dependent', taken as whole, to the Employed.

In our ensuing analysis we attempt to decompose the effects of these four categories (elderly, young, inactive and unemployed). The first two are strictly demographic variables while the last two are more appropriately defined as employment-related variables. The first two variables tend to change relatively slowly while the latter two can change more rapidly. Both sets of variables can be altered by policy interventions. For example, increasing in-migration could increase the proportion of the working-age population in the total population. And employment-focused government policies could help reduce the number of economically inactive and unemployed.

Note that a downward movement in the Economic Dependency Ratio should be interpreted as a positive development since the total number of economic dependants would be decreasing relative to the number of the employed. Such a decline would signify, in other words, a decline in 'economic dependency'.

II.5 Trends in the Economic Dependency Ratio

Figures II.3 show that four of the five European blocs experienced a fall in the Economic Dependency Ratio (EDR) from about 1995 until about 2008. East Europe experienced a fall only between the early 2000s and 2008. This would imply that the employed (the denominator of the ratio) were growing faster than the 'economic dependants' (the numerator) in all of these cases. However, this trend reversed sharply around 2008 for all five blocs.

In West Europe there was a pronounced fall in the EDR from a peak of 1.4 in the late 1990s to less than 1.24 in 2008 (the first figure). However, the CAM projection indicates that the EDR will continuously increase in the future, reaching the level of 1.4 again in 2030.

East Europe tends to have a higher Economic Dependency Ratio than West Europe. Though its EDR dropped precipitously from 1.7 to 1.5 during the mid 2000s, it is projected to climb continuously in the future, reaching 1.8 by 2030—well above the level expected for West Europe (see fifth figure).

South Europe's Economic Dependency Ratio exhibits a distinctive pattern. After having fallen dramatically from a peak of 1.9 in 1995 to 1.4 in 2007 (a very large drop indeed), its EDR is projected to rise again to about 1.7 by 2016 and continues basically at that level until 2030 (see fourth figure). Thus, the level of its EDR will be in the same high range as East Europe's.

North Europe has a relatively low EDR in comparison to those for the other four blocs. After having fallen from a peak of 1.25 in 2004 to a nadir close to 1.0 in 2008, its EDR is projected to increase moderately to about 1.19 by 2030 (see second figure). This resultant level compares favourably to those for the other four European blocs.

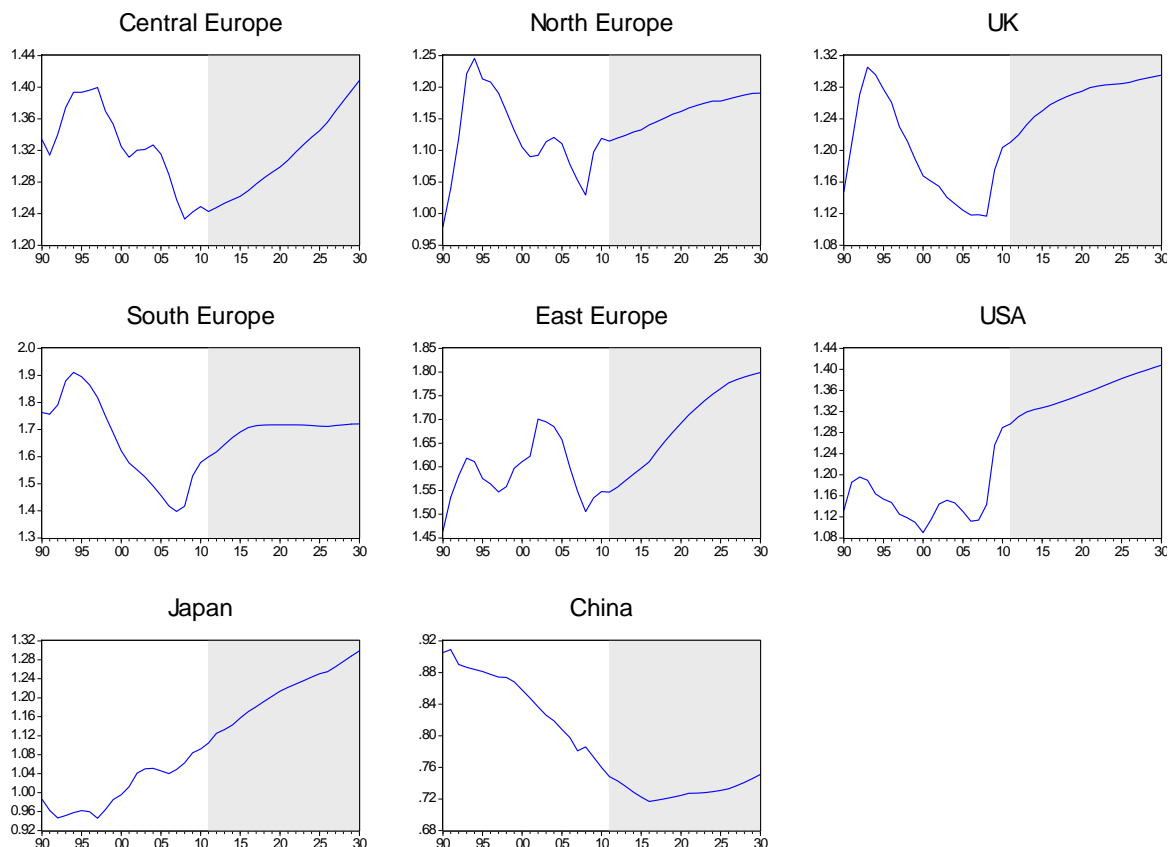
The United Kingdom also has relatively low Economic Dependency in comparison to other European blocs. Having dropped from a peak of about 1.3 in 1993 to a valley of 1.12 in 2008, its EDR rose sharply thereafter until 2011 and is projected to climb slowly to about 1.29 in 2030 (see third figure). However, this resultant level will still be relatively low by European standards.

How do the levels of Economic Dependency in European countries compare to those in countries such as the USA, Japan and China? The USA exhibited relatively low levels of Economic Dependency (for a developed country) between 1990 and 2007, with a slight downward trend (from 1.2 to 1.12) (see sixth figure). The CAM projection suggests that its EDR will rise continuously from 2011 onward, reaching about 1.4 in 2030. This level would be comparable to that in West Europe.

Japan's Economic Dependency has been essentially rising since 1997, but from a relatively low level (i.e., around 0.96 for the EDR) (see figure 7). By 2011 its EDR had risen to about 1.1. By 2030 its EDR is projected to reach 1.3—a level comparable to that in the United Kingdom.

Compared to the experience of the other seven blocs and countries in our sample, China exhibits a unique trend. In 1990, its Economic Dependency Ratio was already relatively low (namely, about 0.9). Through 2011, its EDR declined, almost continuously, to 0.75. By about 2016 its EDR is projected to reach a low point of 0.72. But thereafter it is expected to rise slowly, inching back up to about 0.75 by 2030. Even this level will still place China in a relatively advantageous position vis-à-vis the projected levels in the other seven countries and blocs in our sample.

Figures II.3 Economic Dependency Ratio, Baseline Scenario



II.6 Decomposition of the EDR Trends

How do we explain the trends in the Economic Dependency Ratio for the eight blocs and countries on which we are focusing? The EDR can be readily decomposed into two constituent ratios: 1) the ratio of the combined numbers of young and elderly dependants to the numbers of the employed and 2) the ratio of the combined numbers of the economically inactive and unemployed members of the labour force to the numbers of the employed.

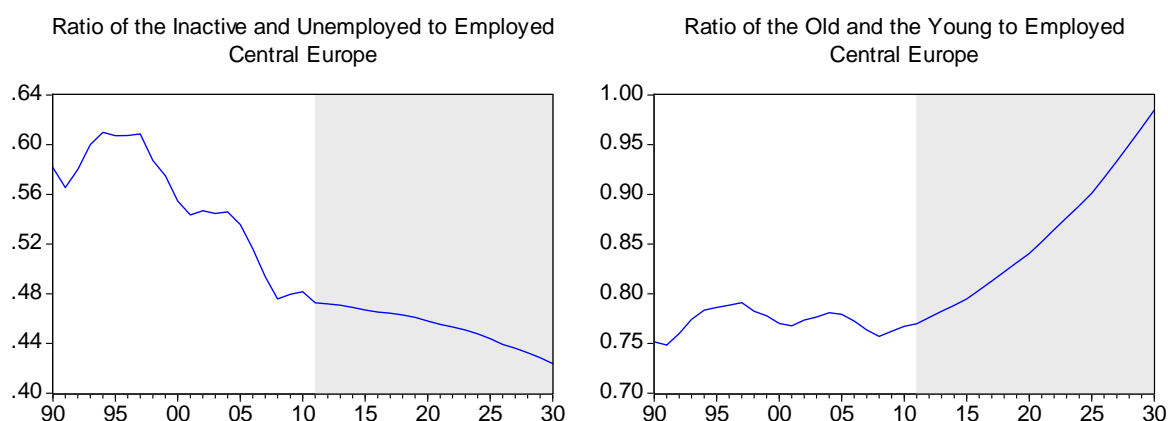
The EDR is the result of simply adding these two ratios together. The first provides information on purely demographic trends and the second on employment-related trends.

Taking advantage of this mathematical property, we can examine, in turn, the trends of each of these two constituent ratios. For this exercise, we confine our attention, for the sake of focus, on four European blocs. North Europe is excluded in this exercise.

In West Europe the EDR is projected to rise moderately to 1.4 in 2030 from a low of 1.24 in 2008. Which of the two components of the EDR have had the most pronounced effect on this trend? The answer is revealed in **Figures II.4**. The ratio of the elderly and young dependants to the employed is the one that is projected to rise between 2011 and 2030 (from about 0.77 to 0.98). In contrast, the ratio of the inactive and unemployed to the employed is projected to fall (from about 0.47 to 0.43). Moreover, the latter ratio has less than half the 'weight' in the total EDR index (e.g., 0.43 compared to 0.98).

Hence, demographic trends (not employment-related trends) will likely be responsible for a rise in economic dependency in West Europe. In fact, employment-related trends are projected to mitigate the rise in such dependency.

Figures II.4 Decomposition of Economic Dependency Ratio, Baseline Scenario, West Europe

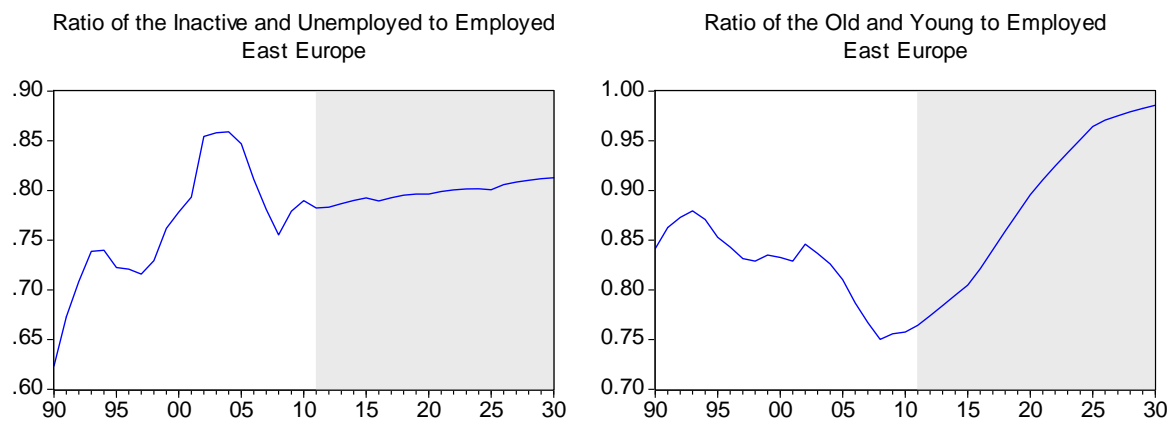


In East Europe demographic trends are also likely to be the main factor in increasing economic dependency in the future, but in this case employment-related trends will tend to reinforce such deterioration (**Figures II.5**). While the ratio of the elderly and young dependants to the employed declined to about 0.75 by 2008, it is projected to

rise to about 0.98 by 2030. The ratio of the inactive and the unemployed to the employed is projected to increase only slightly, from about 0.78 in 2011 to 0.81 in 2030.

Hence, in the case of East Europe, employment-related trends are important, not only because they are projected to worsen but also because this component of the EDR is projected to be relatively high (0.81 in 2030 compared to 0.98 for the EDR's demographic component).

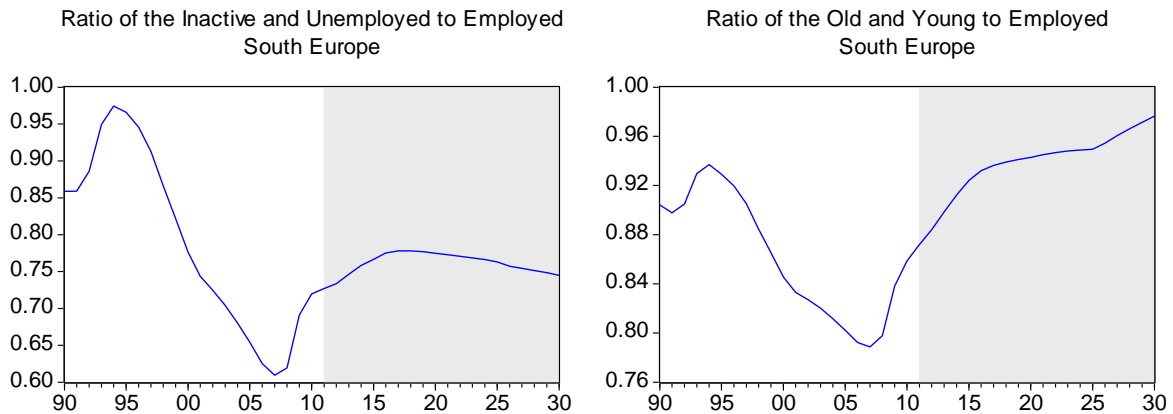
Figures II.5 Decomposition of Economic Dependency Ratio, Baseline Scenario, East Europe



In South Europe demographic trends are also likely to be the decisive factor in worsening economic dependency while employment-related are likely to provide little relief (see **Figures II.6**). After having plummeted to a relatively low level of about 0.79 in 2008, the ratio of the elderly and young dependants to the employed is projected to continue rising after 2011, eventually reaching about 0.97 in 2030.

After having bottomed-out at 0.61 in 2007, the ratio of the inactive and the unemployed to the employed is also projected to continuing rising after 2011, reaching a peak of about 0.78 in 2018. But thereafter it is likely to fall, declining to about 0.74 by 2030. This level is only marginally higher than the level in 2011, i.e., about 0.73.

*Figure II.6 Decomposition of Economic Dependency Ratio,
Baseline Scenario, South Europe*



Lastly, we investigate the movement of demographic and employment-related trends in the United Kingdom. As in West Europe, employment-related trends are likely to mitigate the negative impact of demographic trends (see **Figures II.7**). As in West, East and South Europe, the ratio of the elderly and young dependants to the employed worsened between 2011 and 2030. In this case, the ratio rose from about almost 0.76 to 0.86.

In 2008, the ratio of the inactive and the unemployed to the employed in the UK jumped up from a low level of 0.40, coming close to 0.46 by 2010. This level is projected to remain relatively stable through 2016, before declining to under 0.44 in 2030. Though this employment-related trend is likely to be modestly positive, its 'weight' (0.44 in 2030) will still be low compared to that of the demographic trend (0.86).

*Figure II.7 Decomposition of Economic Dependency Ratio,
Baseline Scenario, United Kingdom*



II.7 Highlights of the Results

In all four European blocs that we have examined, the Economic Dependency Ratio is projected to worsen between 2011 and 2030, after having improved significantly up to the global financial crisis. In all four cases, demographic factors are projected to be the main factor in the rise in 'economic dependency'. Not only does the ratio of the elderly and young dependants to the employed rise in all four cases but it has a predominate influence on the whole index.

There is, however, a more mixed picture to be deduced from the employment-related trends. Only in the case of East Europe does the projection of the ratio of the inactive and the unemployed to the employed exhibit a rise—in this case only a marginal rise. In South Europe, this ratio is projected to rise until 2018 but then fall slightly thereafter—though remaining modestly higher in 2030 than in 2011.

In West Europe, the employment-related trend is projected to fall continuously between 2011 and 2030. In the United Kingdom, this trend remains fairly flat until 2016 and then falls discernibly thereafter.

One of the major initial implications that could be derived from this initial decomposition exercise is that if current European policies (i.e., the 'baseline scenario') continue into the future, there is likely to be little respite from the increasing pressure exerted by adverse demographic factors on economic well-being. Relief is only likely if macroeconomic and structural policies are able to both stimulate a recovery in economic growth and generate broad-based productive employment.

III. DEMOGRAPHIC AND EMPLOYMENT TRENDS: AUGUR'S FOUR MAJOR SCENARIOS

III.1 Introduction

This section of Deliverable 4.3 builds upon the analysis in the previous section by examining the projected trends in demographic and employment variables in each of the four main AUGUR scenarios. These projections have been produced by running simulations of the CAM macroeconomic model under four different sets of assumptions about macroeconomic policies and outcomes, as detailed in Deliverable 1.4.

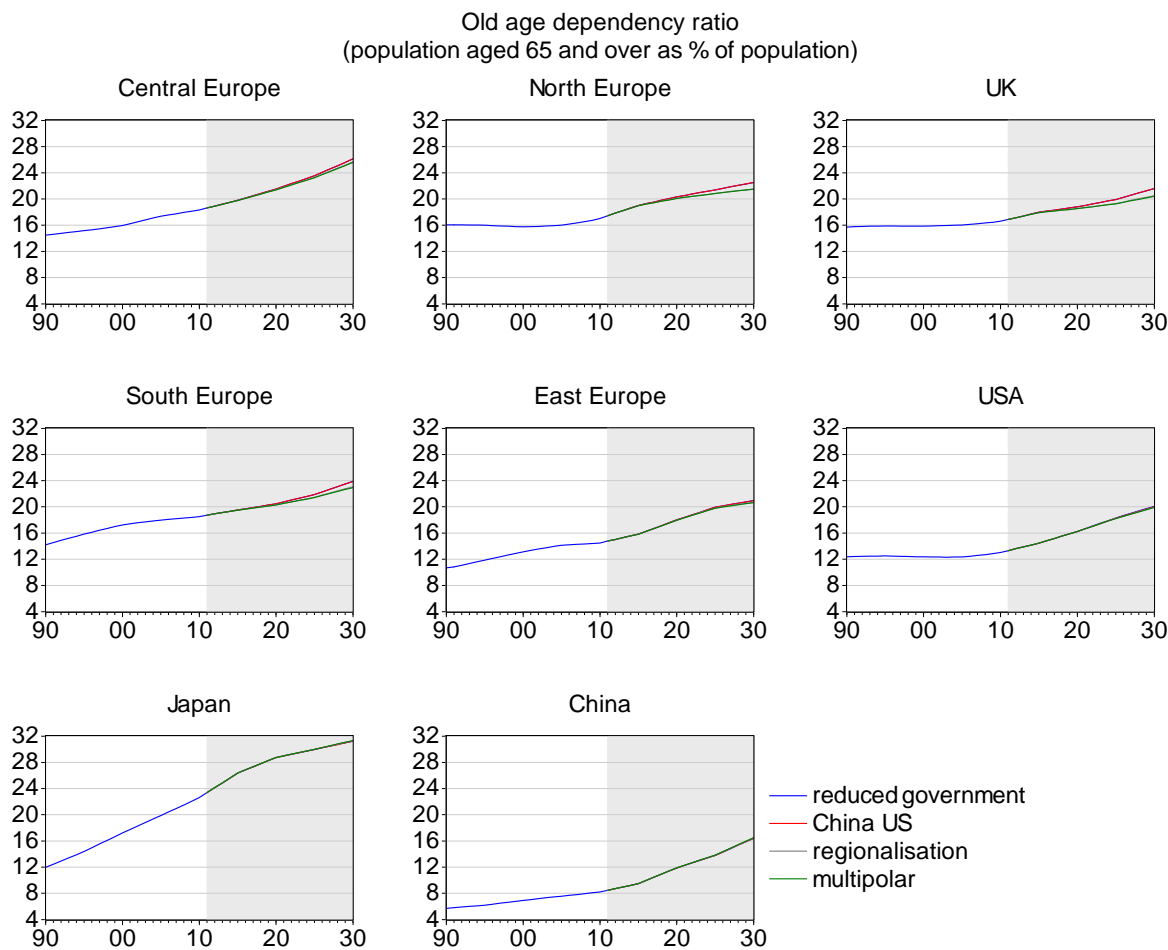
The four scenarios are called, respectively, 'Reduced Government', 'China and US Intervention', 'Regionalisation', and 'Multipolar Governance'. In this exercise, we do not consider three sub-variants on these scenarios: one for the 'Reduced Government' scenario called 'EU Breakup'; and two for the 'Regionalisation' scenario called 'Federal Europe' and 'Multi-Speed Europe'. For Deliverable 4.4 we will include these three additional scenarios.

The focus of this section will be to examine, under each of the four scenario outcomes, the interaction between demographic variables, such as ratios of young dependency and old-age dependency, with variables that are more directly influenced by macroeconomic policy making, such as the rate of employment and the trend in migration. This exercise should serve to shed some light on the extent to which shifts in macroeconomic policy-making are likely to either offset or exacerbate the problems arising from ageing populations in Europe.

III.2 Elderly and Young Dependency Ratios

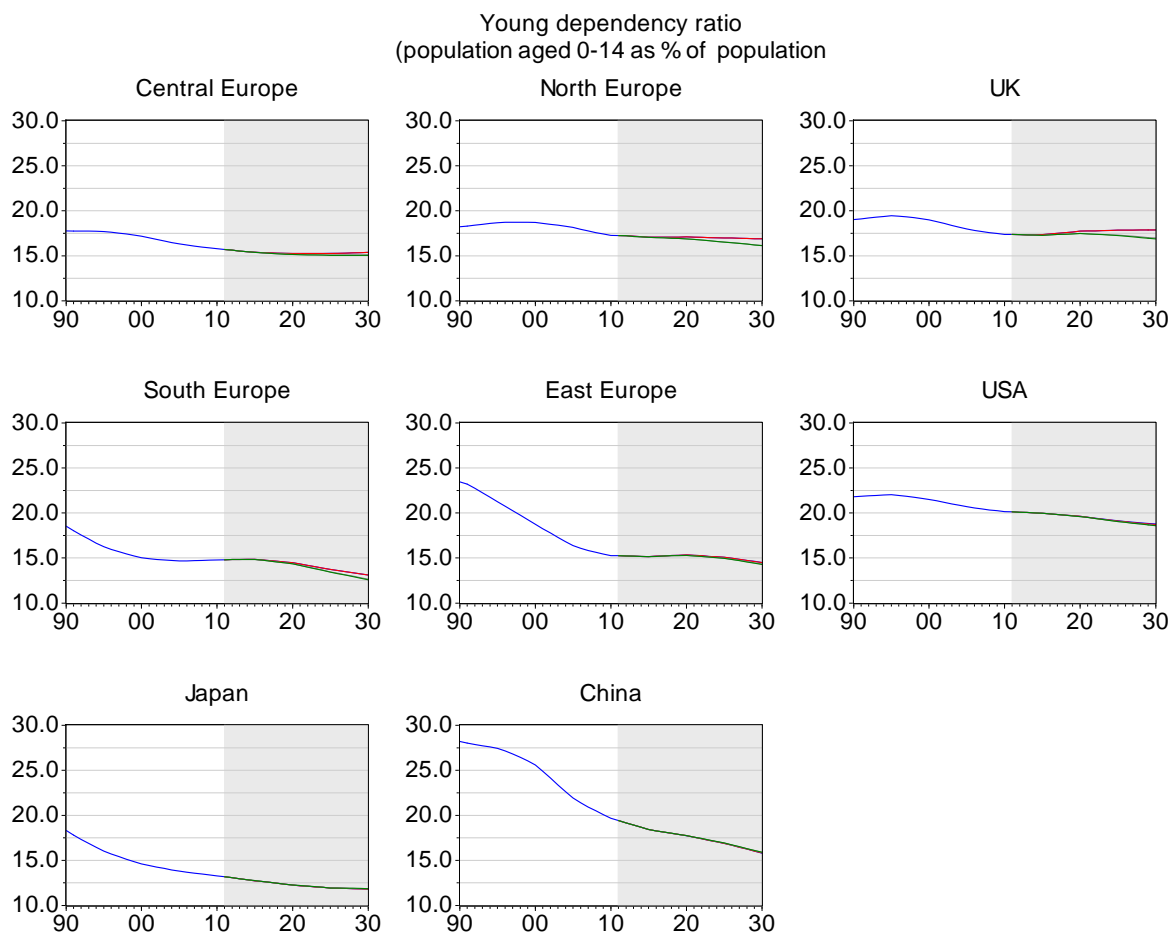
Of the variables under consideration, those that will show the least degree of variation across the four scenarios are the combined Old-Age (over 65) and Young (0-14) dependency ratio (i.e., the ratio of old-age persons and young persons to total population). This is due to the fact that the projections for the size of each group are taken directly from the UN population division statistics, and thus do not vary under the AUGUR scenarios. However, due to variations in the size of the total populations of the blocs as a result of net migration, there are some modest changes in these ratios.

Figure III.1 Elderly population (% of total population)



Figures III.1 and III.2 show the Elderly Dependency Ratio and the Young Dependency Ratio, respectively, for the blocs under consideration. The historical trend until 2011 is represented by a blue line. The four CAM policy scenarios are represented by differently coloured lines (blue for Reduced Government, red for China and US Intervention, grey for Regionalisation and green for Multipolar governance). Mostly only very minor variation from the baseline projections can be observed in the eight Figures. The exceptions are the trends for the UK and North Europe and, to a lesser extent, South Europe. The deviations from the baseline that occur in these blocs are observed in Scenario 1, 'Reduced Government' and Scenario 2, 'China-US Intervention' (which represent the two 'consolidation' scenarios). These deviations are due to changes in the size of the overall populations of these blocs because of changes in net migration. In particular, there is a lower level of inward migration to the UK, North and South Europe in these scenarios. This results in a relative increase in the proportions of the Elderly and the Young of 0.5-1.0 percentage points in these blocs in these two scenarios. [Title below should be placed at the top of the figures above. Include coloured lines in the figures.]

Figure III.2 Young Population (% of total population)



One observation that is of relevance across all of the four scenarios is that the trend in the Young Dependency Ratio will usually tend to partially offset the trend in the Elderly Dependency Ratio. In general, in an ageing population the proportion of young dependants will tend to be falling, at least over a medium-term horizon. Thus, discussions of the problems of demographic change that focus only on increases in the number of elderly persons might present an overly pessimistic view by failing to take into account the counteracting tendency of the decline in the Young Dependency Ratio. One of the strengths of the Economic Dependency Ratio used here is that the relative effects of these two trends is combined and captured in it.

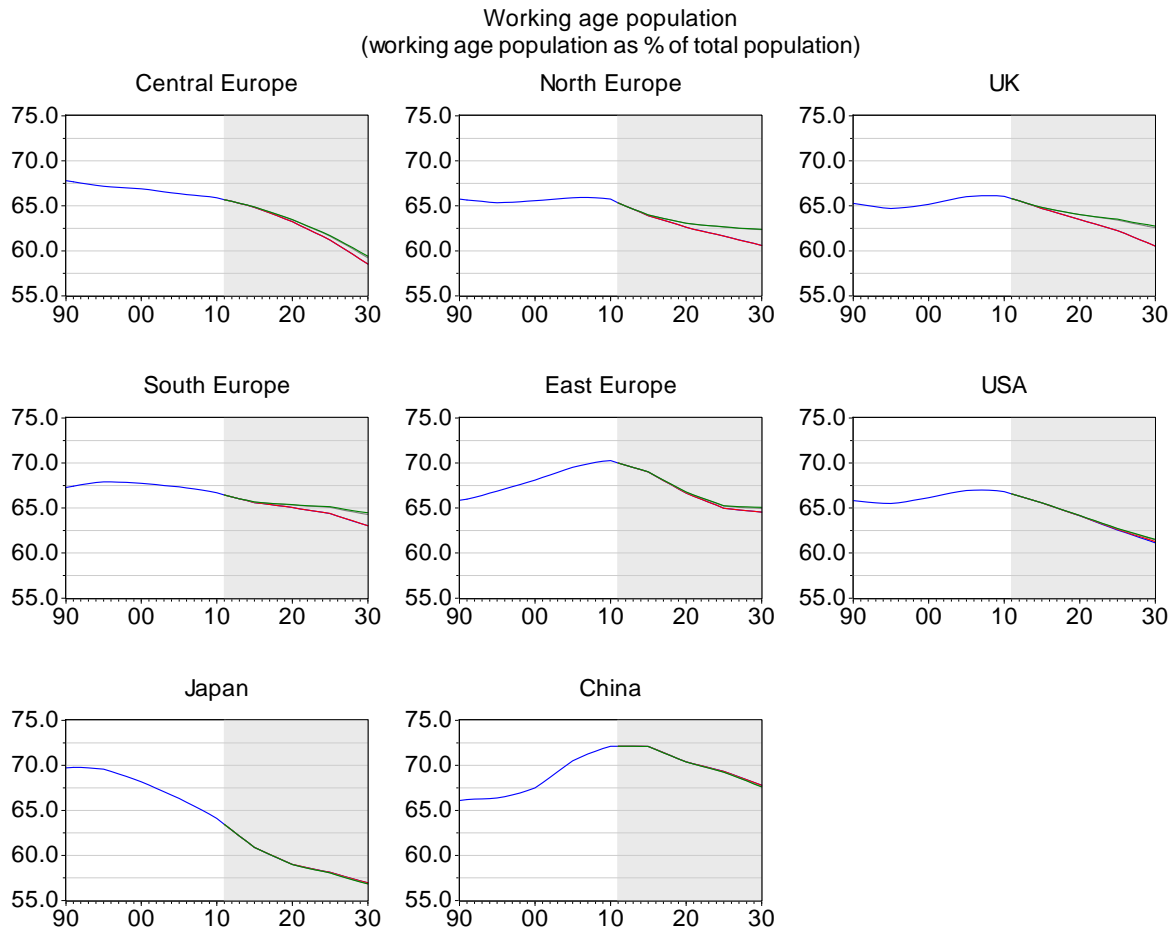
The outcome of these two effects, in combination with net migration, can be observed in the trends of the Working-Age population, which are shown shown in **Figures III.3**. For the same reasons as those discussed above, there is little divergence from the baseline projections since the age structure of the total population is given primarily by the external UN projections.

However, as in Figures III.1 and Figures III.2 above, there is a slight deterioration in the Working Age Population for some European blocs under the scenarios for Reduced Government and China-US Intervention. This is due to reduced inward migration. For the UK, North Europe and South Europe this reduction results in a fall in the Working Age Population of 1-2 percentage points in these 'consolidation'

scenarios compared to the other scenarios and the baseline. **[Title below should be at the top of the figures. Include coloured lines in the figures]**

The outlook for West Europe depicted in these figures appears particularly worrying, since the trend fall in the Young Dependency Ratio observed in all of the other blocs is not replicated for it. Thus, since West Europe also experiences the sharpest increase in the Elderly Dependency Ratio, those of working age are predicted to fall well below 60% of the total population under the two 'consolidation' scenarios.

Figure III.3 Working Age Population (% of total population)



III.3 AUGUR Projections: Economic Dependency Ratio

We now turn to the Economic Dependency Ratio (EDR), as defined in the previous section. The trends in this indicator show a much wider spread of outcomes, both across geographical blocs and across the different scenarios. Despite this spread, there are some important common patterns that emerge.

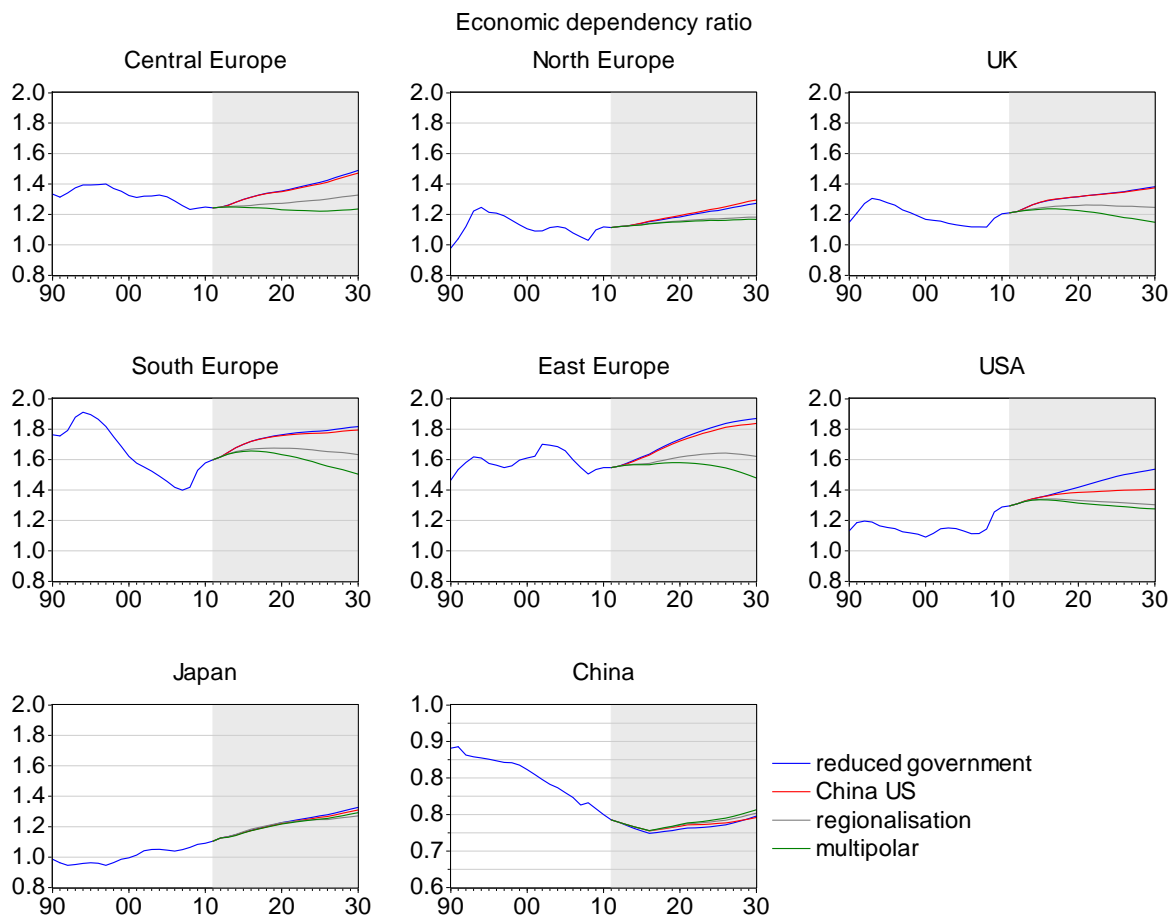
For any given bloc, we can 'rank' each scenario using the predicted level of the Economic Dependency Ratio as our index. What we find is that the ordering of the four scenarios is the same in almost all of the blocs under examination, although the degree of divergence between the scenarios differs substantially.

Specifically, what we observe is that under the assumptions of the two 'consolidation'

scenarios (Scenarios 1 and 2), the level of dependency as measured by the EDR is projected to be greater than in the Baseline scenario.

Conversely, under the 'Regionalisation' and 'Multipolar Governance' scenarios (Scenarios 3 and 4), the projected performance is an improvement on the Baseline, sometimes to a significant degree. Finally, while both the 'Regionalisation' and 'Multipolar Governance' scenarios result in improvements over the baseline, the 'Multipolar Governance' scenario results in the most significant improvements in almost all cases. We now examine the results for each bloc in more detail.

Figure III.4 Economic Dependency Ratio (dependent persons per employed worker)



The European Blocs

The Economic Dependency Ratio in West Europe has fallen steadily from around 1.40 in 1990 to around 1.24 in 2010. As discussed in the previous section, under the baseline scenario this ratio is projected to rise again, returning to its 1990 level of 1.40 in 2030. Under the two 'consolidation' scenarios, a similar pattern is projected: there is a steady rise in the ratio over the next 20 years. However, the trajectory is steeper under the 'Reduced Government' scenario, such that the EDR is projected to reach almost 1.5 by 2030.

Conversely, under the 'Regionalisation' scenario, the increase in the EDR is much less

pronounced, reaching only around 1.33 by 2030. Finally, under the 'Multipolar Governance' scenario, the EDR in West Europe is projected to decline until around 2020 and then rise lightly, such that by 2030 the ratio of dependants to employed workers is projected to have *fallen* below the current level.

In North Europe, the divergence among the different scenarios is less pronounced than in West Europe, with the EDR projected to rise in all four scenarios from a low point reached around the time of the global financial crisis. The two 'consolidation' scenarios provide the least favourable outcome, but uniquely for North Europe, the 'China-US Intervention' scenario is projected to produce a slightly more negative outcome than the 'Reduced Government' scenario.

Under both of the remaining two scenarios, the EDR also rises over the period to 2030, but much more gradually than in the 'consolidation' scenarios. Again the most favourable outcome for the EDR occurs with the 'Multipolar Governance' scenario, in which a rise of around only 5 percentage points takes place from the 2010 level of about 1.12.

However, across all of the four scenarios, the EDR in North Europe remains the lowest among all the European blocs, having been below 1.00 in the late 1990s.

In the remaining three blocs—the United Kingdom, South Europe and East Europe—the pattern is similar to that for West and North Europe. The two 'consolidation' scenarios result in inferior outcomes in comparison to the Baseline, while the 'Regionalisation' and 'Multipolar' scenarios not only exhibit improvements relative to the Baseline but also, in all three cases, result in the EDR reaching a peak before starting to fall back again. The timing of these dynamics varies across the three blocs.

In the case of the United Kingdom, the 'consolidation' scenarios result in a continuation of the sharp increase in the EDR that began with the onset of the global crisis. In both scenarios, the EDR is thus projected to rise continuously from around 1.12, before the crisis occurred, to a level of almost 1.40 in 2030, with no sign of a change of trend.

Under the 'Regionalisation' scenario, the EDR is projected to peak just above 1.25 in 2020 before entering a mild decline. As in all of the other blocs, the most favourable outcome for the UK is observed under the 'Multipolar Governance' scenario, in which there is a peak of the EDR earlier than in the 'Regionalisation' scenario and a more pronounced fall thereafter. This last scenario offers the possibility of the EDR falling to around 1.15 by 2030.

Of all the European blocs, South Europe and East Europe face the most severe challenges. The current ratio in South Europe is around 1.60 dependants per employed worker and in East Europe the situation is not much better, with a ratio of around 1.55. As in the other blocs, the two 'consolidation' scenarios result in deterioration from these levels. This deterioration is more severe in East Europe, with the EDR projected to rise to 1.8-1.9 by 2030. The rise in South Europe is not as severe and is projected to result in an EDR of around 1.80 by 2030.

Uniquely among the European blocs the baseline scenario projected a levelling off of the EDR for South Europe at a level of around 1.70, in contrast to the projected rise for all the other blocs. As discussed above, the 'consolidation' scenarios result in a rise in the ratio. Under the 'Regionalisation' and 'Multipolar Governance' scenarios,

the opposite outcome is predicted, with mild declines in the EDR—for example, to a low of around 1.50 in 2030 in the case of the latter scenario.

Finally, in East Europe the 'Regionalisation' scenario again offers a significant improvement over the Baseline, with the EDR peaking at around 1.65 shortly before 2030. But the most optimistic projections are provided by the 'Multipolar Governance' scenario, under which the EDR levels off at around 2020 before entering a steady decline back to a level of about 1.50 by 2030.

USA, Japan and China

Figure III.4 shows that there are marked differences between the projections for the USA and the two Asian countries, Japan and China. While the USA shows a wide spread of potential outcomes across the four CAM scenarios, ordered in the same way as was observed in Europe, both Japan and China show much less sensitivity to the different macroeconomic assumptions underlying the scenarios.

As in the Baseline, Japan's EDR continues to rise to a level of around 1.30, with only minor variations in outcome across the four policy scenarios. China's remarkably low EDR (note the different scale in the graph) rises modestly across the four scenarios, as is the case in the Baseline, again with little differentiation in outcomes across all the scenarios.

In contrast to the results for Japan and China, only the projections for the USA show any strong differences across the scenarios. The baseline projection for the USA shows a steady rise in the EDR from a pre-crisis low of around 1.10 up to a ratio of around 1.40. But only the 'Reduced Government' scenario shows a more unfavourable outcome for the USA than that in the Baseline, with the EDR projected to reach over 1.50 by 2030.

Conversely, under the 'US-China Intervention' scenario, the EDR levels out at around 1.40, reflecting the projected improvements in US employment. However, the only significant improvements over the Baseline performance are predicted for the 'Regionalisation' and 'Multipolar Governance' scenarios, with a decline in the EDR projected under both scenarios such that the ratio of dependants per employed worker reaches around 1.30 by 2030 in each case.

III.4 Decomposition of the EDR: Projections of the Underlying Ratios

We now turn to the question of how the variables that make up the EDR interact to produce the projections described in the previous section. As explained in Section II, the Economic Dependency ratio can be decomposed into the sum of two ratios: the ratio of the inactive plus the unemployed to the employed, and the ratio of elderly and young dependants to the employed.

In this section we examine how each of these two ratios varies under the four CAM scenarios in order to determine the relative contributions of each to the projections of the EDR discussed in the last section. We call the two components that combine to form the EDR the 'Demographic Dependency Ratio' and the 'Working Age Dependency Ratio' as shown in Figures III.5 and III.6 for the five European blocs.

Figure III.5 Decomposition of EDR, West and North Europe and UK

'Demographic Dependency Ratio', top, ratio of elderly and young to working

'Working Age Dependency Ratio', bottom, ratio of unemployed and inactive to working

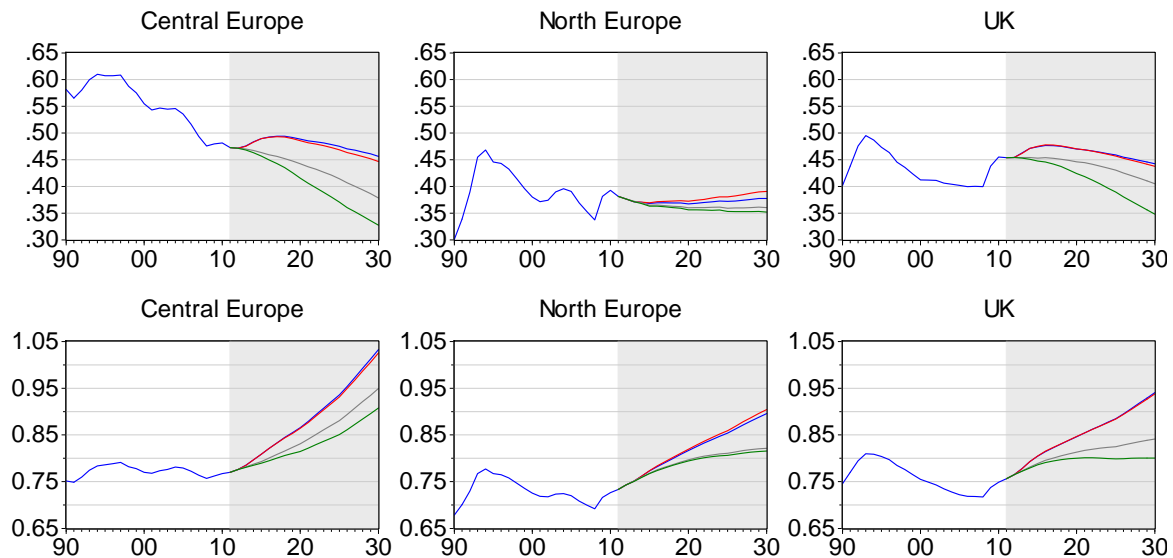
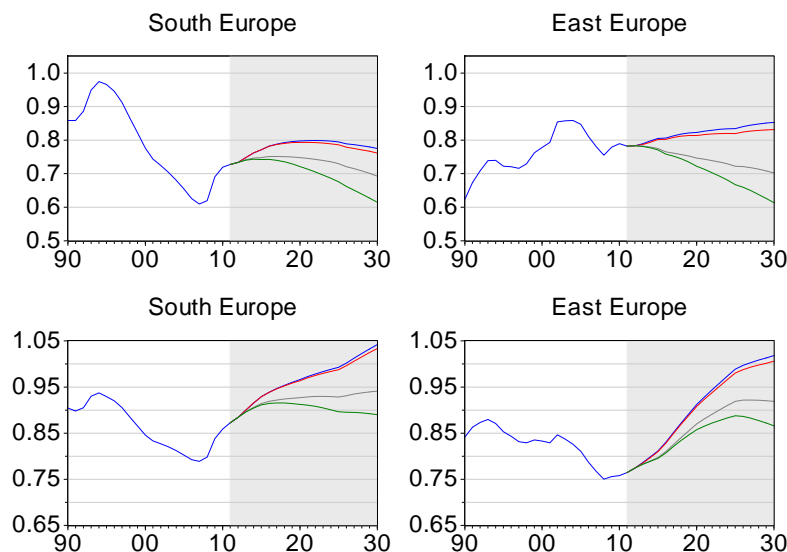


Figure III.6 Decomposition of EDR, South and East Europe

'Demographic Dependency Ratio', top, elderly plus young to working

'Working Age Dependency Ratio', bottom, unemployed and inactive to working



Starting with West Europe, the ratio of the unemployed and inactive to the employed (the 'working-age dependency ratio') is forecast to fall in all four scenarios, although the effect is considerably stronger in the 'Regionalism' and 'Multipolar Governance' scenarios.

The opposite trend is projected for the ratio of the elderly and young dependants to the employed (the 'demographic dependency ratio'), again with a significantly stronger upward trend projected under the two 'consolidation' scenarios. In the case of the 'Multipolar Governance' scenario, the decrease in dependency arising from the

increased employment of working-age people is enough to offset the rise in the 'demographic dependency ratio'.

In fact, as was discussed in Section III.2, within the 'demographic dependency ratio' (the ratio of the elderly and the young dependants to the employed), in almost all of the blocs under consideration, the phenomenon of a fall in young dependents is not strong enough to offset the increase in elderly dependants.

For example, in the most favourable scenario for West Europe, namely, the 'Multipolar Governance' scenario, in which the Economic Dependency Ratio is projected to remain constant at around 1.25, this relatively benign outcome arises due to the combined effect of increases in working-age employment and decreases in the number of young dependents, even though there is a rise in the numbers of elderly dependents. A similar dynamic occurs in most of the other blocs.

However, it is important to emphasize that since the effect of the rise in the number of elderly dependants is stronger than the effect of the decline in the number of young dependants, the key variable that ultimately determines whether the overall Economic Dependency Ratio will rise or fall is the level of employment.

This is demonstrated, for example, in the case of North Europe. Similar to happens for West Europe, the 'demographic dependency ratio' (the ratio of the elderly and the young to the employed) is projected to rise in all four scenarios, while the absolute levels of the ratio remain slightly lower than those for West Europe.

The difference in outcomes between the two blocs occurs in the 'working-age dependency ratio'. Whereas in West Europe the proportion of working-age people dependent on the employed is projected to decline in all scenarios, in North Europe this ratio is projected to stay relatively constant (or even increase slightly in the 'US-China Intervention' scenario). Thus, because of the lack of change in the ratio of the employed in the working-age population, the increasing proportion of elderly people in the economy results in a rising EDR in North Europe.

The decomposition of the EDR for the United Kingdom shows trends similar to those described for West Europe, although the positive effects of rising employment in the 'Regionalisation' and 'Multipolar Governance' scenarios is stronger. Thus, the 'demographic dependency ratio' in the UK, which starts at around 0.75, is projected to rise to almost 0.95 in the two 'consolidation' scenarios, remain almost constant in the 'Multipolar Governance' scenario, and rise moderately in the 'Regionalisation' scenario. However, the 'working-age dependency ratio' is projected to fall in all four scenarios, although not significantly in the two 'consolidation' scenarios.

In other words, the interaction of these two dependency ratios gives rise to a wide spread of projected outcomes for the EDR in the UK. In the most favourable outcome, namely, that for the 'Multipolar Governance' scenario, the unchanged ratio of the elderly and young to the employed combines with a falling 'working-age dependency ratio' so that the projected overall EDR exhibits a sharp decline.

At the other extreme, in the two 'consolidation' scenarios, an essentially unchanged 'working-age dependency ratio' combines with a sharply rising 'demographic dependency ratio' to give a significant overall rise in the EDR. The UK is thus a good example of a country in which macroeconomic policies that target employment have the potential to affect—either positively or negatively—the overall economic dependency rates in the economy.

The trends in the two dependency ratios in South Europe are similar to those projected for the UK, although both ratios start from significantly higher levels than those for the UK. The elderly and young dependency ratio starts just below 0.90 in 2010 and is projected to rise to around 1.05 in the two 'consolidation' scenarios and to fall slightly in the 'Multipolar Governance' scenario.

In South Europe unemployment is projected to rise in the two 'consolidation' scenarios and fall significantly in the 'Multipolar Governance' scenario. Thus, as is the case with the UK, there is a fairly wide spread of projected outcomes. The overall 'Economic Dependency Ratio' could either rise or fall depending primarily on the trend in employment.

Finally, in East Europe employment outcomes can vary widely depending on the scenario. This is evident in the trends for the 'working-age dependency ratio'. Starting from nearly 0.80, the highest level for any European bloc, this ratio is projected to rise to about 0.85 in 2030 in the two 'consolidation' scenarios. However, in the 'Multipolar Governance' scenario, it is projected to fall to nearly 0.60.

The 'elderly and young dependency' ratio in East Europe starts from a level comparable to those of the other blocs, namely, at around 0.75. This ratio is expected to rise, although the extent of the increase varies across the scenarios. Thus, the overall spread of the Economic Dependency Ratio is very close to that of South Europe—with the two 'consolidation' scenarios projecting a level of over 1.80 in 2030 and the 'Multipolar Governance' scenario projecting a fall to around 1.50. But the dynamics are quite different in the two blocs: unemployment and the inactivity of the working-age population plays a more significant role in East Europe while the purely demographic variables are more important in South Europe.

III.5 Summary of Results

In this section we have examined how the evolution of dependency might vary on basis of the differing assumptions of the four major AUGUR scenarios. In particular, we have focused on our composite index, the 'Economic Dependency Ratio', and examined its projected path until 2030. In addition, we have demonstrated how the variables that compose the EDR interact across the different scenarios by disaggregating the EDR into two component indices, the 'working-age dependency ratio' and the 'demographic dependency ratio'.

The key finding that emerges from this exercise is that, despite the problems posed by demographic pressures due to ageing populations, a wide range of outcomes are possible on the basis of a country's or bloc's performance on employment. The scenario projections demonstrate that the adverse shifts in demographic dependency ratios can be considerably offset if employment can be increased.

In the most optimistic case, the 'Multipolar Governance' scenario, the Economic Dependency Ratio (EDR) is projected to decline in four of the five European blocs, and to rise only slightly in the fifth, North Europe (which starts, however, from the lowest overall value). Thus, in this scenario, the maximum value of the EDR by 2030 is 1.50 in South Europe and the minimum is just 1.15 in the United Kingdom.

At the opposite end of the spectrum, the results for the 'Reduced Government'

scenario projects that the EDR will be close to or above 1.50 in three of the five blocs. The value of the EDR in East Europe will reach nearly 1.90. This level implies that there would be nearly two dependent persons for every employed worker in East Europe by 2030.

Examination of the component ratios that constitute the EDR demonstrates that the relative effects of demographic and employment-related variables differ across the blocs. Even the most favourable outcomes in West and North Europe still show a steady rise in the ratio of elderly and young dependents to the employed. In the UK, South and East Europe, it appears that these ratios could potentially be stabilised.

The projections of the 'working-age dependency ratio' show a more consistent pattern across the five blocs. This ratio is projected to remain flat or rise only in North Europe. In all other blocs, the ratio is projected to fall under the two most favourable scenarios, whereas it tends to rise initially, then fall back in the two 'consolidation scenarios'.

Finally, it should be noted that this analysis has not taken into account differences in the costs of dependency across the various dependent groups, i.e., the costs of supporting the unemployed, the inactive, the young and the elderly. This analysis has also not examined the effects of labour productivity in the different scenarios. In future scenarios we will focus more on the issue of labour productivity, particularly in those scenarios in which employment is increased.

We will also extend our analysis of trends in the Economic Dependency Ratio to the three new Europe-focused 'sub-variant' scenarios that have been recently developed for the AUGUR project: 'EU Breakup', 'Federal Europe' and 'Multi-Speed Europe'.

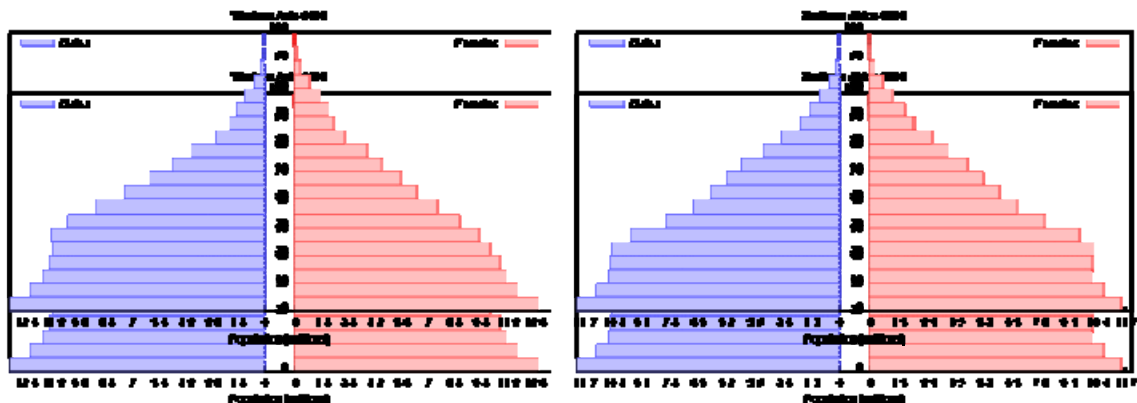
IV. Demographic and Employment Trends: Analysis of North Africa and West Asia

In this section of the Deliverable we switch our focus from Europe to North Africa and West Asia (the latter often called ‘Middle East’). The problems associated with economic dependency in this region are particularly acute. However, these problems arise from a combination of demographic and employment-related factors that are different from those observed in the European blocs. In particular, in this region ageing-related problems are of a lower significance. Unemployment, particularly among young people, represents by far the greatest demographic challenge.

IV.1 Demographic Trends

Figures IV.1 shows the age structure of the population in North Africa and West Asia. In contrast to the situation in Europe and other developed economies such as Japan, the population in these countries contains a very high proportion of young people. This ‘youth bulge’ can be seen at the bottom of the age distribution in the figures below.

Figure IV.1 Demographic Structure in the MENA region.



Source: UNDP

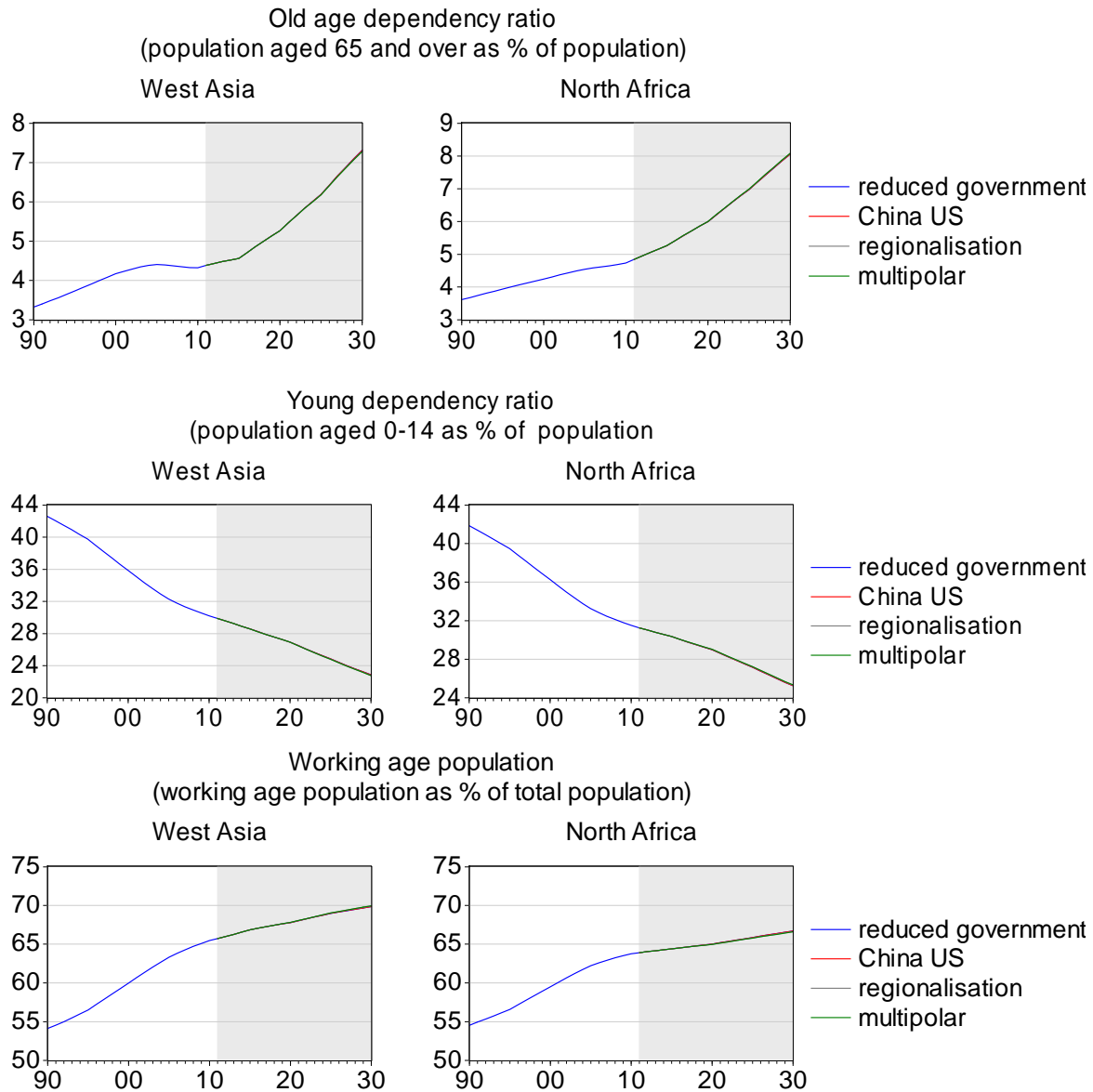
Figures IV.2 shows the old-age and youth dependency ratios for North Africa and West Asia (the NAWA region). It is readily observable that the demographic structure in this region results in a very different combination of the elderly and youth dependency ratios to those previously discussed for the European blocs. While the trends in the historical data and the projections for this region of a falling youth dependency ratio and a rising elderly dependency ratio are similar to that seen in Europe, there is a significant difference in the respective absolute values of the ratios.

In Europe the old-age dependency ratio in 2010 took a range of values, from a low of around 15% in East Europe to a high of around 20% in West Europe. In contrast, in the NAWA region this ratio was below 5% in 2010. Thus what is widely regarded as

the key demographic issue in Europe—namely, an ageing population—is not at all of comparable significance for the NAWA region.

The same is true at the opposite end of the age spectrum. Figures IV.2 shows that while the young dependency ratio is in the 15%-17% range for the European blocs, it is about double this value in the NAWA region, i.e., around 30%-32%.

Figures IV.2 The Elderly and Young Dependency Ratios and the Working Age Population



When the two elements of the young dependency ratio and the elderly dependency ratio are combined, the total levels are around 35% in the NAWA region, which are close to those observed in Europe. However, while the proportion of working-age persons in Europe is projected to decline steadily over the next twenty years as increases in the elderly population outweigh decreases in the young, the opposite is observed in the NAWA region: the working-age population is projected to increase as young dependents join this grouping at a greater rate than older workers leave to

become elderly dependants. Given the age structure of the population in the NAWA region, it is clear that purely demographic issues do not pose problems in the same way as they do for the ageing populations of European countries and Japan.

IV.2 Trends in the Economic Dependency Ratio

The problems of the NAWA region are primarily related to providing adequate employment for a growing working-age population, particularly among its younger cohorts. This condition becomes clear when we examine the Economic Dependency Ratio for the two blocs in the region. **Figures IV.3** shows the trend in the EDR along with the trends in its two sub-components.

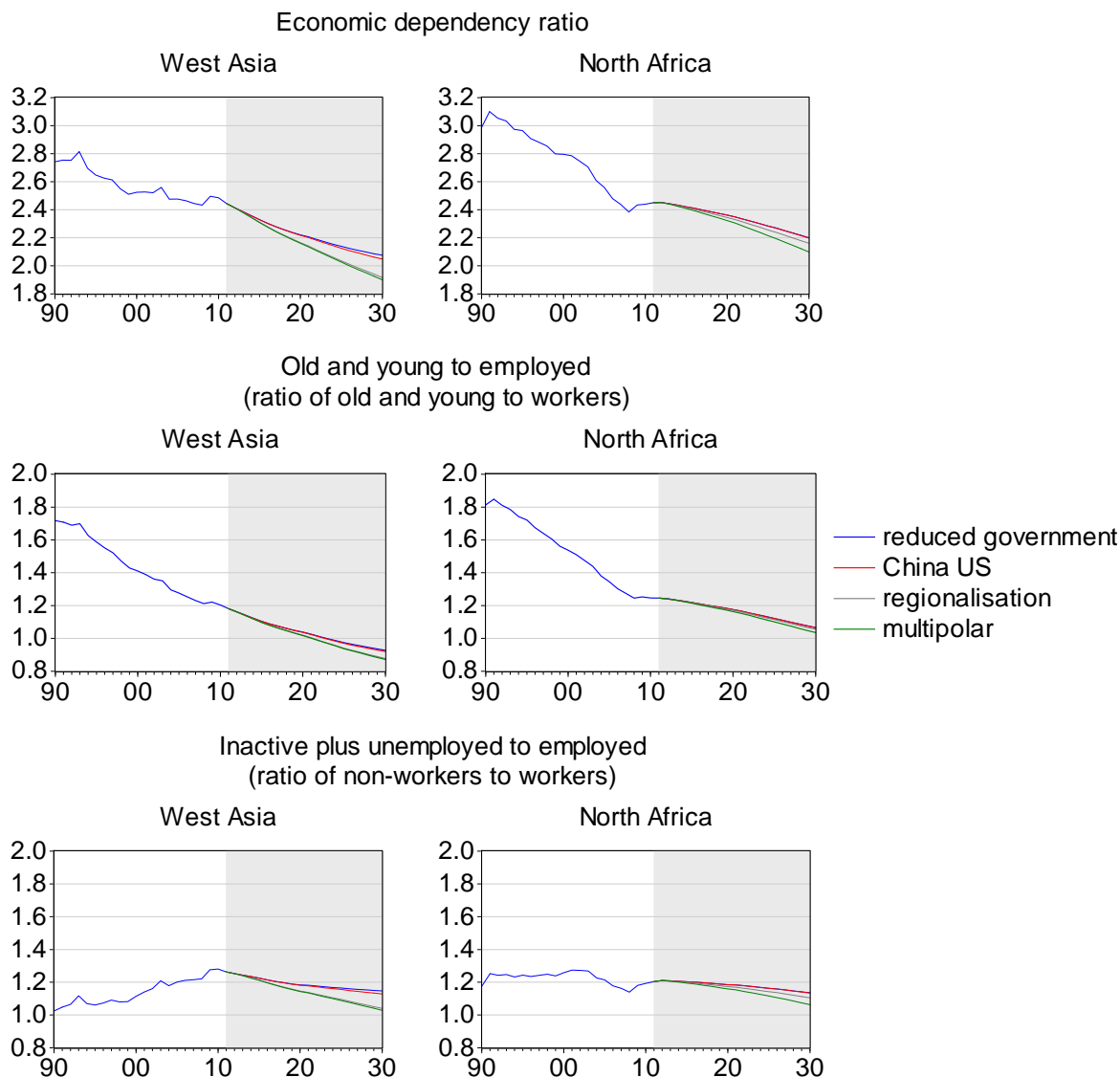
Although the EDR has fallen significantly in both blocs over the last 20 years, the level is still strikingly high: in 2010, the EDR was around 2.4 for both blocs, implying that every employed person was effectively supporting well over two dependants. This level was significantly higher than that for any European bloc. Even under the least favourable projections (such for the two 'consolidation' scenarios), East and South Europe are expected to reach dependency levels of between 1.8 and 1.9 by 2030.

Furthermore, the projected dependency ratios for the NAWA region are much less sensitive to the alternative policy scenarios in the four AUGUR scenarios. In contrast, there was significant divergence across the four scenarios in the European blocs. The best- and worst-case scenarios for the EDR for West Asia are 1.9 and 2.1, respectively, and for North Africa 2.1 and 2.2, respectively.

If we examine the two major components of the EDR, i.e., the 'demographic dependency ratio' and the 'working-age dependency ratio', we find that the historical and projected paths of the 'demographic' dependency ratio are almost identical in the two NAWA blocs. There is a strong steady decline between 1990 and 2030 in all scenarios. By 2030, this ratio is projected to have fallen to around 1.0 from its original value of about 1.8. Despite almost halving over this period, the projected value is still remarkably high in comparison with the levels across Europe.

Because of the different projections for the working-age population in Europe and the NAWA region, it is clear that the high level of dependency in North Africa and West Asia is the result of low employment levels (in the denominator of the ratio) instead of a high proportion of the population falling outside of working age (in the numerator).

Figures IV.3 The Economic Dependency Ratio and Its Component Ratios



The main divergences between the trends observed in the two NAWA regions are found in the ratio of the inactive and the unemployed to the employed, the 'working-age dependency ratio'. This ratio remained fairly flat at around 1.25 in North Africa over most of the 1990s, before dropping in the next decade to a low point of around 1.15 before the global financial crisis caused the ratio to rise again. In West Asia, however, this ratio rose from around 1.00 in 1990 to over 1.25 in 2010.

In both blocs the 'working-age dependency ratio' is projected to fall. Of the two components of the EDR, it is the 'working-age dependency ratio' that displays greater sensitivity to different assumptions of the four AUGUR scenarios. In particular, for West Asia, the value of this ratio varies from a projection of close to 1.2 in the two 'consolidation' scenarios to a projection of around 1.0 in the other two scenarios.

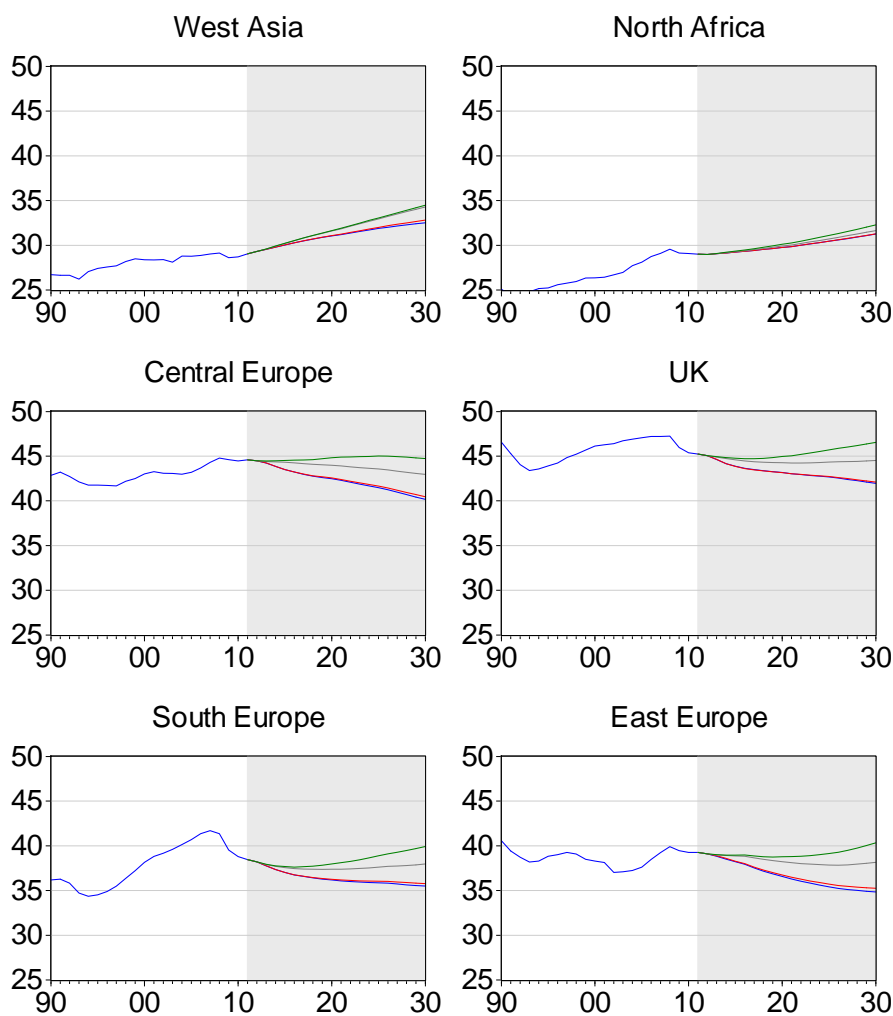
Despite the projected fall in the 'working-age dependency ratio' for the NAWA region, this ratio is still relatively very high in comparison to the values for the European blocs, where it has not risen above 1.00 in any bloc over the last 20 years.

IV.3 Levels of Employment and Economic Activity

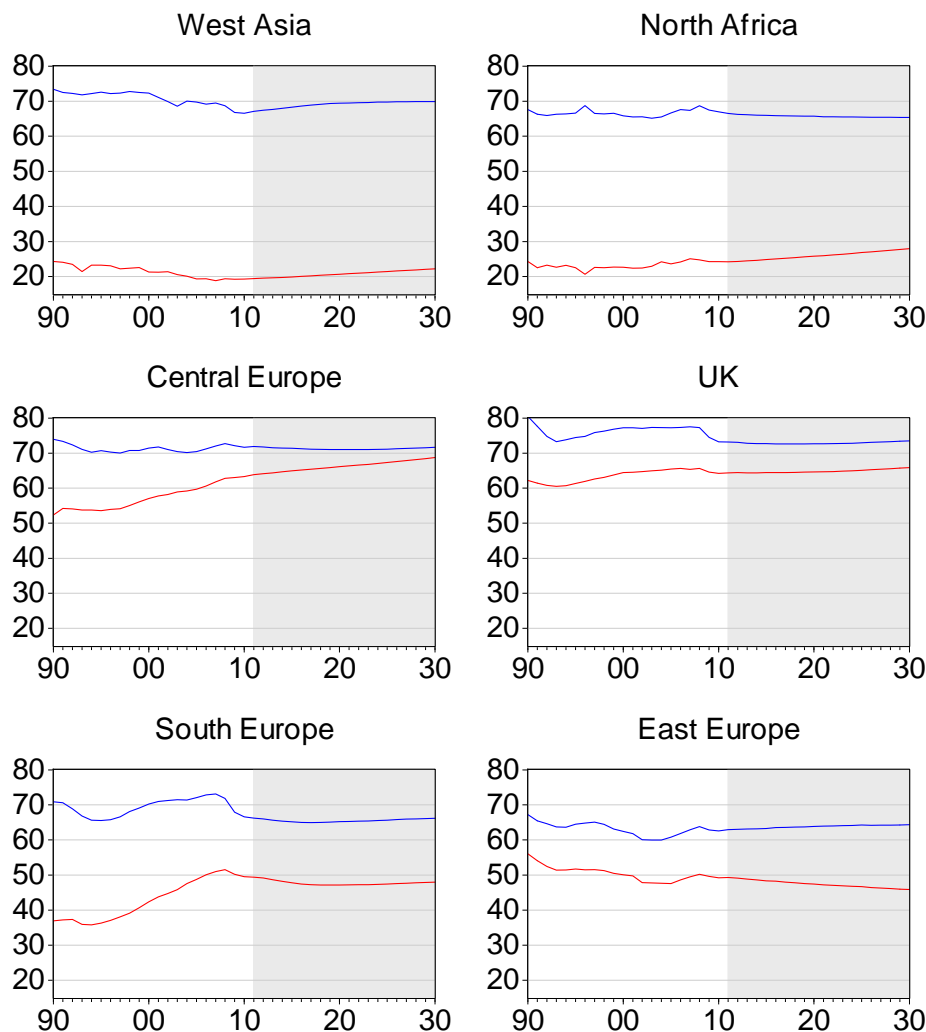
We now examine in more detail one of the key underlying factors in the remarkably high dependency ratios in the NAWA region, i.e., the very low levels of employment. **Figures IV.4** shows employment as a percentage of the total population in the two NAWA blocs, as well as for selected European blocs for the purposes of comparison. In both NAWA blocs, the proportion of the total population employed has been under 30% for the last 20 years. While the 'Regionalisation' and 'Multipolar Governance' scenarios improve the employment outcomes for this region in comparison to the 'Baseline' scenario and the two 'consolidation' scenarios, the improvements do not qualitatively change the condition of low employment levels in the region.

One significant element in the very low overall levels of employment in the NAWA region is the divergence between male and female employment rates. This is demonstrated in **Figures IV.5**, which show male and female employment as a proportion of the total population for the NAWA region and some European blocs. (We use the baseline projection here for the sake of simplicity).

Figure IV.4 Employment Rates in NAWA and Europe (% of population)



Figures IV.5 Male and Female Employment Rates in NAWA and Europe (% of total respective population)



As can be seen, the difference in the levels of male employment (the blue lines) between the European blocs and the NAWA blocs is not wide, with values of 60%-80% in all blocs.

It is in the relative levels of female employment (the red lines) that the differences between Europe and the NAWA region are most visible: in both North Africa and West Asia, formal female employment is between 20% and 30% of the total female population. This trend contrasts with levels of formal female employment that reached at least 50% by 2010 in all European blocs, and that were above 60% in the UK and West Europe. Thus, in order to reduce dependency rates in the NAWA region, it would be useful for policy to focus on increasing the level of female participation in the workforce.

Another significant feature of the demographic make-up of North Africa and West Asia is the level of youth unemployment. Since youth unemployment statistics are not yet included in the AUGUR model, we illustrate this point using estimates of youth employment and activity from the ILO (ILO KILM 2012). **Table IV.1** shows the ILO estimates of relevant variables for selected countries in the NAWA region.

The first three columns of the table show the estimated statistics for the population aged 15-24 in each country in these two regions, along with the number of active and employed people in that age group. Thus, if we take Egypt as an example, the youth population (15-24 years of age) is estimated at around 16 million persons. Of these 16 million persons, 5.4 million are classified as 'active', and almost 4 million are classified as 'employed'.

Table IV.1 Youth Activity and Employment, NAWA Region

Youth Activity and Employment, 2010, 15-24 age group, ILO Estimates, (000s)

	Population	Activity	Employment	Unemployment Rate	Activity Rate	Employment % of population	Youth Unemployment and Inactivity Ratio
West Asia							
Bahrain	188	85	61	32.4%	45.2%	32.4%	67.5%
Iran, Islamic Republic of	16253	5042	3897	23.9%	31.0%	24.0%	76.0%
Iraq	6205	1791	1050	16.9%	28.9%	16.9%	83.1%
Jordan	1332	361	259	19.4%	27.1%	19.4%	80.6%
Kuwait	423	150	132	31.2%	35.5%	31.2%	68.8%
Lebanon	759	223	173	22.8%	29.4%	22.8%	77.2%
Oman	611	247	193	31.6%	40.4%	31.6%	68.4%
Saudi Arabia	4947	799	566	11.4%	16.1%	11.4%	88.6%
Syrian Arab Republic	4166	1242	1005	24.1%	29.8%	24.1%	75.9%
Turkey	12883	5163	4067	31.6%	40.1%	31.6%	68.4%
Yemen	5327	1965	1411	26.5%	36.9%	26.5%	73.5%
North Africa							
Algeria	7292	2048	1590	21.8%	28.1%	21.8%	78.2%
Egypt	16009	5438	3965	24.8%	34.0%	24.8%	75.2%
Libyan Arab Jamahiriya	1124	420	325	28.9%	37.4%	28.9%	71.1%
Morocco	6268	2256	1875	29.9%	36.0%	29.9%	70.1%
Sudan	8568	3022	2317	27.0%	35.3%	27.0%	73.0%
Tunisia	1994	658	452	22.7%	33.0%	22.7%	77.3%

This example serves to demonstrate the shortcomings of traditional measures of unemployment: the 'employment rate' is conventionally calculated by dividing the number of employed persons by the number of active persons. Thus for Egypt, youth unemployment would be placed at roughly 25% using this standard measure. However, when we consider that only 5.4 million of 16 million young people are classified as 'active', it is clear that this statistic might be misleading. An alternative measure is the proportion of the total population in a given age group which is not in employment due to either 'inactivity' or official 'unemployment'. Using this alternative definition of 'non-employed', Egypt's youth 'non-employment' rate is roughly 75%.

A key observation is that the NAWA regions has very low 'activity rates'. Thus, policy that is directed at increasing the level of youth activity as well as employment rates, if successful, could potentially make a significant impact on overall dependency ratios in the region.

V. INITIAL POLICY IMPLICATIONS: AN EMPLOYMENT-FOCUSED ECONOMIC RECOVERY FOR EUROPE

V.1 Introduction

In this section we apply a 'fiscal expansion' approach to economic recovery in Europe, focusing on the need, first and foremost, to foster significant growth in employment. The results of this scenario are compared specifically to those for the 'Baseline' scenario, which is a regular feature of the CAM modelling for the AUGUR project. The demographic and employment trends for the 'Baseline' scenario are presented in Section II of this deliverable.

Employment generation should be a high priority for European policy makers, particularly because of secular declines in the size of the working-age population across the continent (see Section II.1 for historical trends in the working-age population). Moreover, unemployment levels (especially among young workers) are unbearably high in many countries in the aftermath of the global financial crisis. For example, Eurostat data for 2010 shows high levels of youth unemployment for several European countries. The unemployment rate for the group that is 15-24 years of age in Spain stood at 41.6% in 2010, in Croatia at 30.7%, in Italy, Ireland and Hungary at about 27% and in Sweden at 25% (Eurostat 2011). Hence, a growth strategy that gets people back to work—or helps them secure their first job—represents, indeed, one of the best strategies for debt reduction currently available.

We use the CAM global macroeconomic model to gauge the impact of implementing such a strategy. In this case, we construct a scenario that includes changes in macroeconomic policies that are designed to stimulate an employment-focused economic recovery in Europe (as well as in the US). We then compare this scenario's results with those of the 'Baseline' scenario (see Appendix 1, which presents the Eviews programming for our 'Employment-Focused Scenario').

We start with the policy lever that has the most immediate potential to stimulate Europe's economies, i.e., an increase in government expenditures. We also assume that these expenditures will help promote private investment. For example, they could take the form of public investment in infrastructure, skills training or new cutting-edge technology. In order to reinforce the desired increase in private investment, we also assume a modest stimulus to bank lending.

Both public expenditures and private investment are marshalled to target an increase in employment, not economic growth alone. This target is based on the ratio of the number of employed to the number of people of working age. We calibrate the size of the stimulus in order to achieve a desirable, but also feasible, level of this ratio for each European bloc.

V.2 Employment Targets

In the case of North Europe (e.g., The Nordic countries), West Europe (e.g., Germany and France) and the UK, the employment ratio targets are 70-74%. For

East Europe (e.g., Poland and the Czech Republic), the target is much more modest, namely, 60%. For South Europe (e.g., Greece, Italy, Portugal and Spain) the target is also low, i.e., 62%.

With the exception of North Europe, these targets would represent a significant improvement in employment. But they are still certainly feasible in comparison to past historical trends. **Table V.1** shows the historical trends in the employment rate (2000-2011) and the employment outcomes (2012, 2015, 2030) for the four European blocs, the UK and the US.

*Table V.1 Employment Scenario: Employment Rate,
2000-2030 (selected years)*

Employment Scenario: Employment Rate (%)									
Bloc	Bloc code	2000	2008	2009	2010	2011	2012	2015	2030
North Europe	Eun	72.5	74.8	72.4	71.8	72.4	72.6	73.3	75.6
West Europe	Euw	64.3	67.8	67.6	67.5	67.9	67.9	68.8	71.1
UK	uk	70.8	71.4	69.5	68.7	68.8	68.8	70.7	73.6
South Europe	eus	56.3	61.7	59.1	58.1	57.9	57.7	59.5	64.1
East Europe	eue	56.2	57.0	56.2	55.9	56.1	56.1	57.2	62.4
US	us	72.3	69.7	66.2	65.4	65.4	65.3	66.6	71.9

In order to support the recovery in Europe, we also assume that a similar set of policies will be implemented in the US. For example, its target for the ratio of the employed to the working-age population is 72% -- a level that the country last achieved in 2000 (Table V.1).

However, if the set of stimulus policies outlined above were implemented in isolation, they would not likely be feasible. They would probably not help reduce government deficits (because of the unilateral increases in government expenditures); neither would they likely help achieve sustainable growth in GDP and employment because of potentially adverse impacts on the current account.

Thus, we need to implement a set of more comprehensive, but also mutually compatible, macroeconomic policies. For this purpose, we consider, in turn, increases in revenue and changes in real exchange rates.

V.3 Supportive Policies

If future government deficits are going to be contained, government revenue will have to be boosted in conjunction with the projected increases in expenditures. So, for West Europe and the UK, we assume that net government income as a ratio to GDP rises to 25%. For North Europe, we assume a target of 28%. Our targets for South and East Europe are more modest, namely, 23% and 21%, respectively. We also assume a modest target of 20% for the US – though this target is still well above the abysmally low level of government income in 2010 (**Table V.2**).

Table V.2 Employment Scenario: Government Income as a Percentage of GDP, 2000-2030 (selected years)

Employment Scenario: Government Income as % of GDP									
Bloc	Bloc Code	2000	2008	2009	2010	2011	2012	2015	2030
North Europe	eun	32.3	34.4	31.0	28.8	28.8	29.0	28.3	28.0
West Europe	euw	22.8	21.9	20.1	19.4	20.2	20.8	23.6	25.0
UK	uk	21.2	19.3	15.1	15.3	17.1	18.7	22.8	25.0
South Europe	eus	19.7	18.9	16.0	14.8	15.2	15.9	20.6	23.0
East Europe	eue	18.3	20.0	18.1	17.5	18.2	19.1	20.3	21.0
USA	us	18.2	13.2	9.0	8.9	10.7	12.3	17.4	20.0

The last problem that we need to address is the potentially negative effects on European current accounts because of the projected employment-focused fiscal stimulus. To address this problem, we need to set targets for each bloc's real exchange rates. **Table V.3** shows the real exchange rate targets for the European blocs, the UK and the US.

Table V.3 Employment Scenario: Real Exchange Rates, 2000-2030 (selected years)

Employment Scenario: Real Exchange Rate (index)									
Bloc	Bloc Code	2000	2008	2009	2010	2011	2012	2015	2030
North Europe	eun	1.07	1.40	1.35	1.34	1.42	1.44	1.70	1.70
West Europe	euw	0.92	1.21	1.20	1.12	1.14	1.16	1.30	1.30
UK	uk	1.02	1.11	1.00	0.98	1.00	1.02	0.90	0.92
South Europe	eus	0.76	1.11	1.10	1.02	1.04	1.04	0.81	0.86
East Europe	eue	0.40	0.70	0.64	0.62	0.64	0.65	0.55	0.55
USA	us	1.03	0.92	0.96	0.94	0.90	0.90	0.97	1.00

As a global reference point, we set a ceiling ratio of 1 on the real exchange rate of the US dollar, the world's still dominant reserve currency. Setting a ceiling makes sense since even our baseline projection (which assumes no policy changes) suggests that there will be continuous pressure on the US dollar to appreciate after 2011.

We now squarely confront the controversial topic of breaking up the Eurozone, namely, abandoning the common nominal exchange rate for both West and South Europe. Though the pros and cons of such a position remain hotly contested, we nevertheless allow the nominal exchange rates to diverge between these two Eurozone blocs in order to achieve targets for their real exchange rates that are desirable for Europe as a whole.

The target for the real exchange rate for West Europe is set at 1.3 while that for South Europe is set at 0.75. These changes are also programmed to happen usually by 2015. These particular targets signify that relative to the US dollar, the real exchange rate of West Europe will appreciate while that of South Europe will depreciate.

Such a reform is designed to remove the inherent relative exchange-rate advantage of West Europe as well as the relative disadvantage of South Europe, both of which have resulted from adhering to a common currency.

Outside the Eurozone, the targeted appreciation of the combined real exchange rate of North Europe is set at 1.7. In contrast, the combined real exchange rate of East Europe is set at 0.55. Also, British pound sterling is assumed, relative to the US dollar, to depreciate in real terms to 0.9. All of these rates have been selected after extensive testing of their feasibility and impact in combination with the rest of our assumed policy changes.

V.4 Further Scenario Results

Economic Growth and Migration

In this section we expand on the results of our employment-focused scenario. Compared to the results for the 'Baseline' scenario, economic growth is more rapid across the board (see **Table V.4**). The most dramatic results are evident in South Europe and East Europe. Average growth of GDP jumps from 0.8% per year to 3.5% for South Europe, and from 2.1% to 5.5% for East Europe. There are more moderate increases for North Europe and the United Kingdom (as well as the US), and only a modest increase for West Europe.

*Table V.4 Projected Average Growth Rate of GDP,
Europe and the US, 2012-2030*

Bloc	Bloc Code	Employment Scenario (2012-2030)	Baseline Scenario (2012-2030)
North Europe	eun	3.2	2.4
Central Europe	euw	2.1	1.7
UK	uk	3.4	2.0
South Europe	eus	3.5	0.8
East Europe	eue	5.5	2.1
USA	us	3.9	2.8

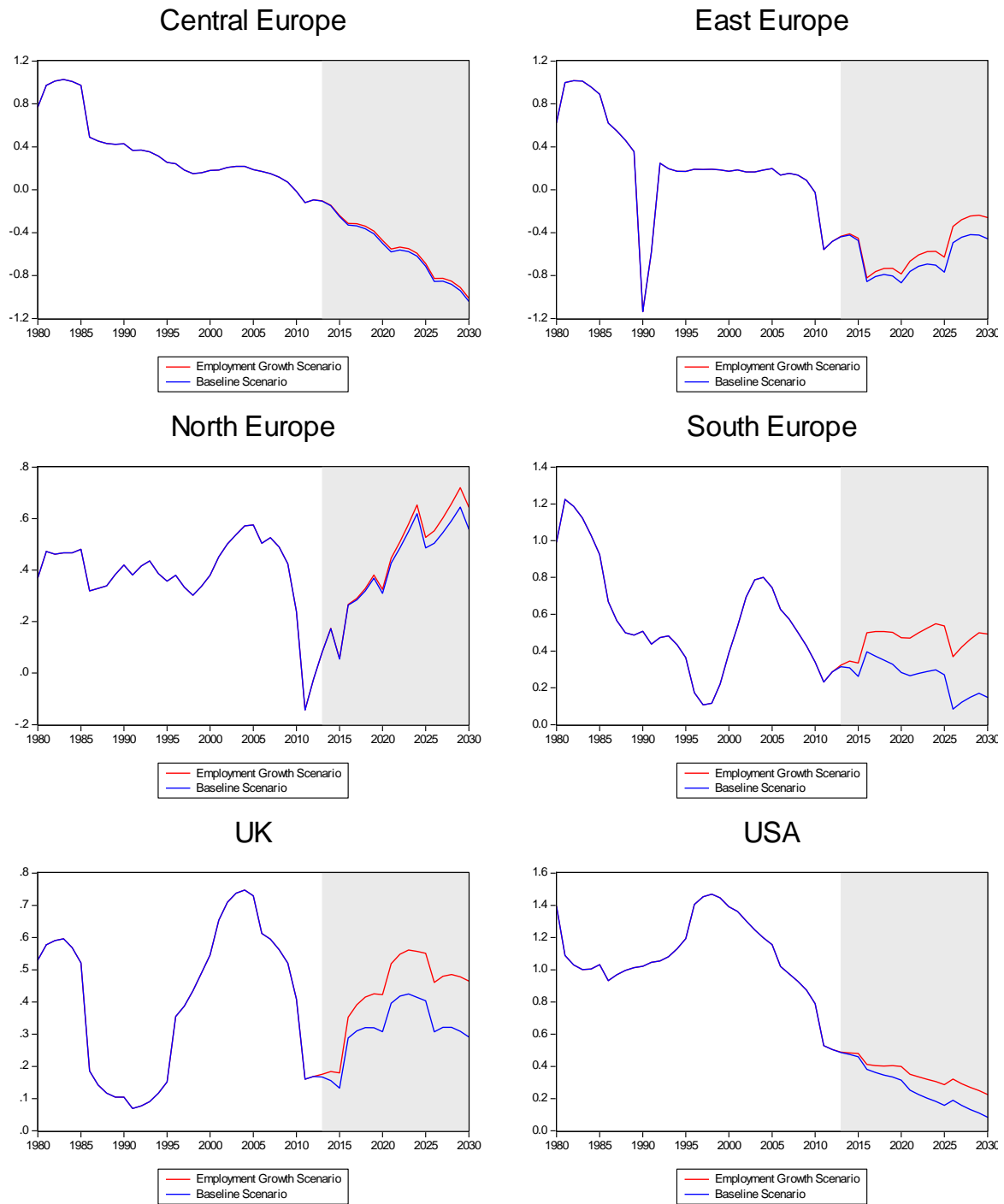
As highlighted earlier in Table V.1, in some blocs the increase in the employment ratio by 2030 exceeds our targets. Migration contributed to some of these increases (**Table V.5**). This is evident in North Europe, UK and South Europe, which experience an upswing in new migrant workers.

*Table V.5 Employment Scenario:
Net Migration as % of Employment (2000-2030)*

Employment Scenario: Net Migration as % of Employment									
Bloc	Bloc Code	2000	2008	2009	2010	2011	2012	2015	2030
North Europe	eun	0.33	1.04	0.98	0.90	0.88	0.88	0.94	1.43
West Europe	euw	0.38	0.36	0.34	0.32	0.32	0.31	0.31	0.15
UK	uk	0.55	0.68	0.72	0.73	0.74	0.76	0.85	1.33
South Europe	eus	1.29	1.73	1.61	1.46	1.40	1.37	1.43	2.02
East Europe	eue	-0.24	0.09	0.08	0.08	0.09	0.10	0.15	0.42
USA	us	1.20	0.65	0.68	0.64	0.63	0.62	0.61	0.60

There also appears to be a *return* of workers to East Europe, a region that had suffered from marked out-migration after the mid-1980s. However, where there is an increased net inflow of workers, such as into South Europe and the UK, the impact on the size of the working age population is still not dramatic (**Figure V.1**).

*Figures V.1 Change in the Working Age Population:
Employment Scenario vs. Baseline Scenario*



Expenditure, Revenue and Net Lending

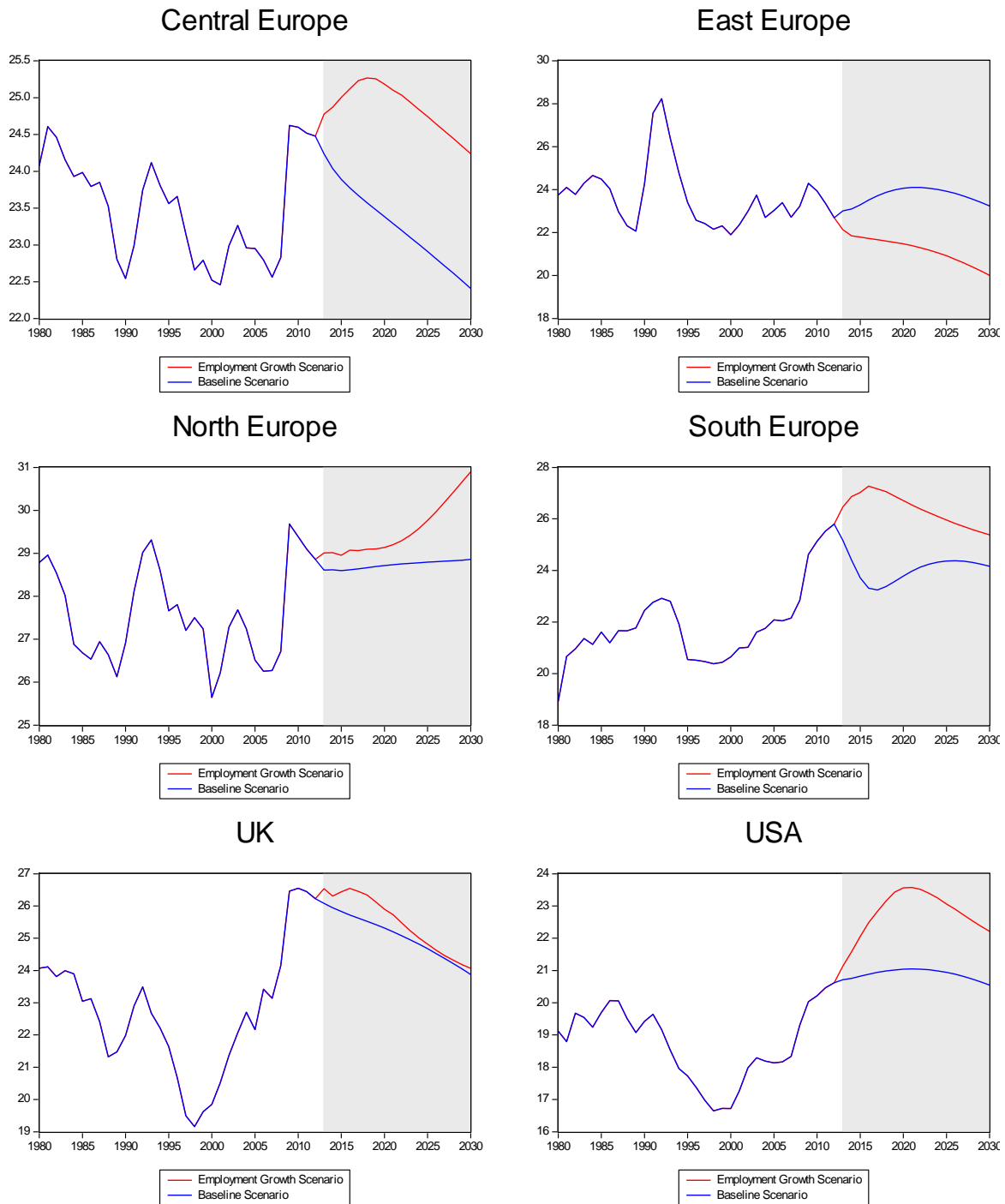
In the early years of our scenario, namely 2012-2015, the growth of government expenditures is rapid, but it markedly slows down in most blocs after 2015 (**Table V.6**). In the UK, for example, the growth of government expenditures is 2.6% after 2015, compared to 4.4% during 2012-2015. In West Europe, government expenditure increases by 1.7% per year after 2015, which is a decline from a 3.1% rate of growth during 2012-2015 (Table V.6).

Table V.6 Employment Scenario: Government Expenditure and GDP Growth, (2012-15 and 2015-30)

Employment Scenario: Growth of Government Expenditure and GDP (%)					
Bloc	Bloc Code	Government Expenditure		GDP	
		2012-15	2015-30	2012-15	2012-15
North Europe	eun	2.8	4.0	2.6	3.3
West Europe	euw	3.1	1.7	2.6	2.1
UK	uk	4.4	2.6	4.2	3.4
South Europe	eus	6.2	3.0	4.3	3.5
East Europe	eue	5.2	4.4	6.3	5.6
USA	us	5.9	4.1	3.6	4.1

Even though the ratio of government expenditures to GDP increases during the early years of our scenario in almost all blocs, it falls sharply thereafter, except in North Europe (Figures IV.2). There are two reasons for this trend. In almost all cases, growth of government expenditure (the numerator) slows substantially after 2015 while growth of GDP (the denominator) continues at a more rapid rate than that of expenditures. **Figures V.2** show the resultant trend in the shape of Government expenditures as a ratio to GDP for the European blocs and the US.

*Figures V.2 Government Expenditures as % of GDP:
Employment Scenario vs. Baseline Scenario*



As a result of these trends, Government Net Lending as a ratio to GDP converges towards zero in blocs such as West Europe, East Europe and the UK. Although this ratio also dramatically improves in other blocs such as South Europe and the US, it remains negative (**Table V.7**). In North Europe, net lending worsens, however.

*Table V.7 Employment Scenario: Government Net Lending
as % of GDP (2000-2030)*

Employment Scenario: Government Net Lending as % of GDP									
Bloc	Bloc Code	2000	2008	2009	2010	2011	2012	2015	2030
North Europe	eun	6.7	7.7	1.3	-0.5	-0.3	0.1	-0.6	-2.9
West Europe	euw	0.2	-0.9	-4.7	-5.2	-4.3	-3.6	-1.4	0.8
UK	uk	1.3	-4.9	-11.3	-11.3	-9.4	-7.6	-3.6	0.9
South Europe	eus	-0.9	-3.9	-8.6	-10.3	-10.3	-9.9	-6.5	-2.4
East Europe	eue	-3.6	-3.2	-6.2	-6.5	-5.2	-3.6	-1.4	1.0
USA	us	1.5	-6.1	-11.1	-11.4	-9.8	-8.3	-4.7	-2.2

Government deficits are eliminated or significantly improved partly due to the slowdown in government expenditure after an initial increase (as shown in Table V.6). Also, government net income as a ratio to GDP appreciably improves in the majority of the blocs (**Table V.8**). This trend is attributable, in part, to our assumption that governments would undertake explicit efforts to improve revenue generation. But the achievement of more rapid growth rates of employment and private incomes also indirectly helps to boost government revenue.

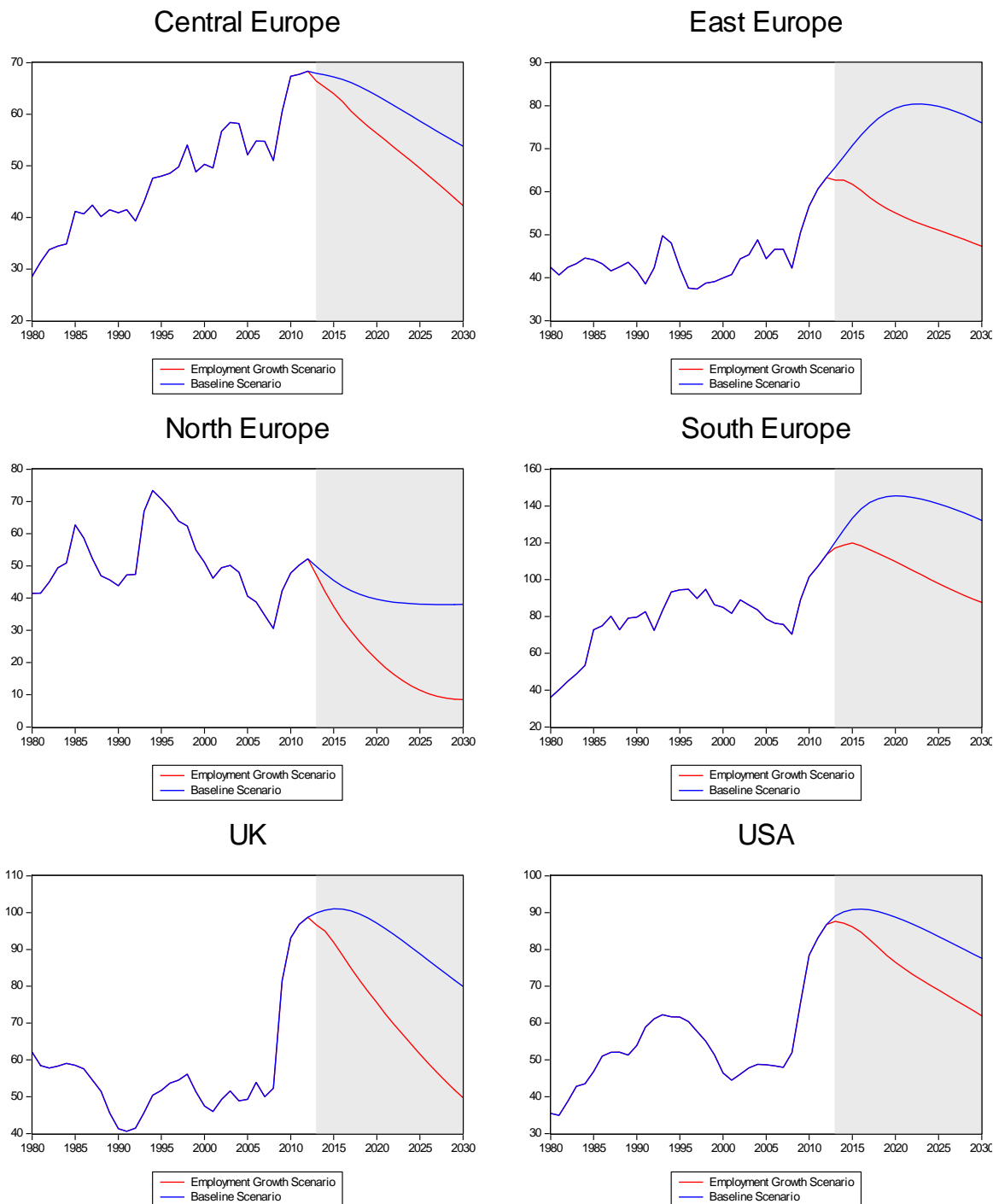
*Table V.8 Employment Scenario: Government Net Income
as % of GDP (2000-2030)*

Employment Growth Scenario: Government Income as % of GDP									
Bloc	Bloc Code	2000	2008	2009	2010	2011	2012	2015	2030
North Europe	eun	32.3	34.4	31.0	28.9	28.8	29.0	28.3	28.0
West Europe	euw	22.7	21.9	20.0	19.4	20.2	20.8	23.6	25.0
UK	uk	21.2	19.3	15.1	15.3	17.1	18.7	22.8	25.0
South Europe	eus	19.7	18.9	16.0	14.8	15.2	15.9	20.6	23.0
East Europe	eue	18.3	20.0	18.1	17.5	18.2	19.1	20.3	21.0
USA	us	18.2	13.2	9.0	8.8	10.7	12.3	17.4	20.0

Falling Debt

Not surprisingly, government debt as ratio to GDP falls dramatically in all blocs (**Figures V.3**). Though debt levels have been manageable in North Europe, West Europe and even East Europe, their debt-to-GDP ratios still fall substantially. For example, West Europe's debt/GDP falls from 67% in 2010 to 42% in 2030 and North Europe's from 48% to 9%.

*Figures V.3 Government Debt as % of GDP
Employment Scenario vs. Baseline Scenario*



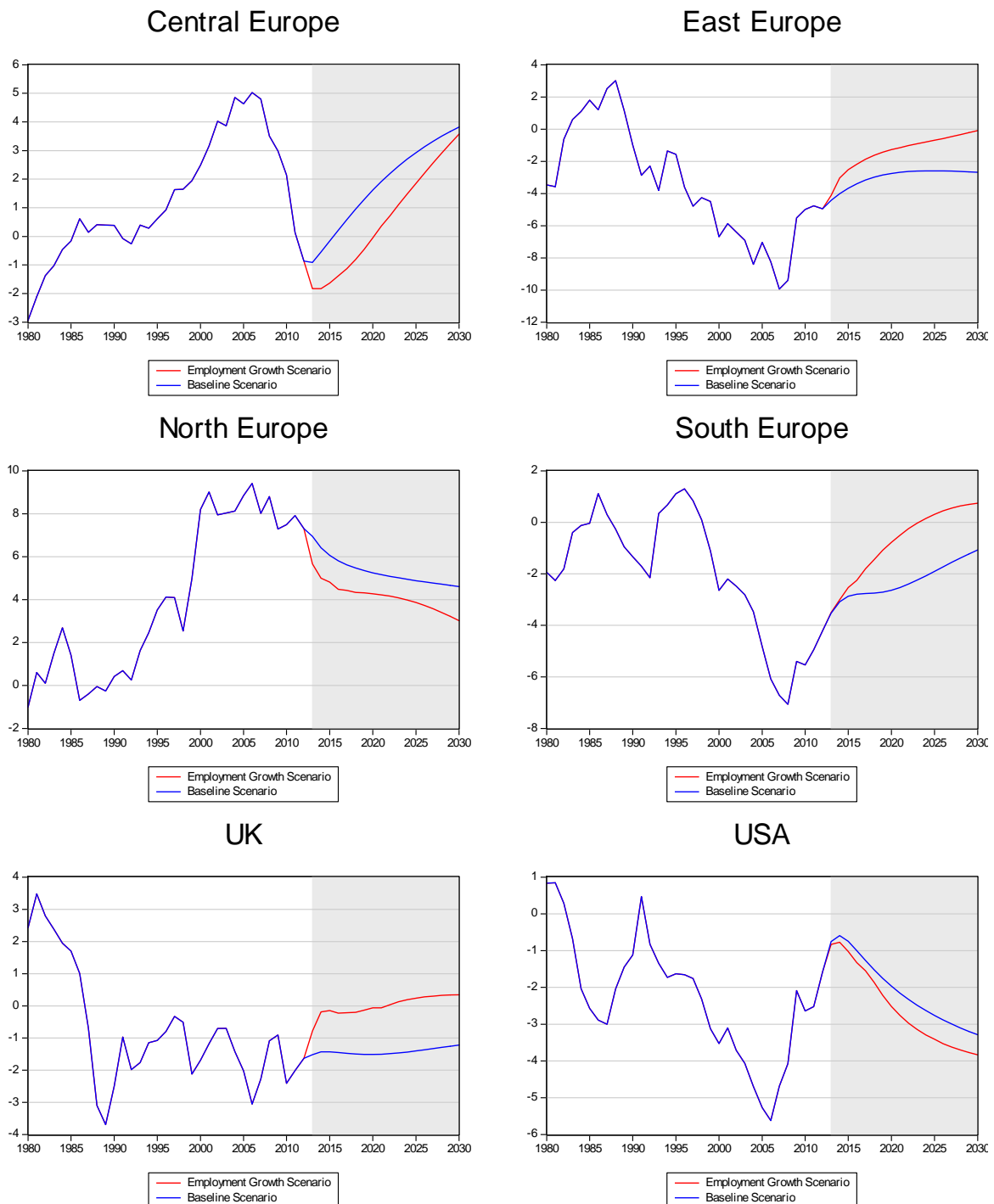
The other blocs with heavy initial debt burdens, such as South Europe, the UK and the US, also experience a significant lightening of their load. For example, the US's debt/GDP falls from 78% in 2010 to 62% in 2030. The latter is a more manageable level. The UK achieves almost a halving of its debt burden, from a level equivalent to 93% of GDP in 2010 to 50% in 2030.

South Europe's debt burden is also reduced but not as substantially as one would hope. Its debt/GDP declines from 102% in 2010 to 88% in 2030. In these circumstances, it should be obvious that some debt restructuring or relief is desirable, preferably sooner rather than later.

Exchange-Rate Impacts

In this section we assess the impact of our proposed changes in real exchange rates across the European blocs. First we examine the impact on trends in the current account (**Figures V.4**).

*Figures V.4 Current Account as % of GDP
Employment Scenario vs. Baseline Scenario*



Already becoming negative in 2011, West Europe's current account as a ratio to GDP becomes even more negative through 2013. Thereafter, however, it progressively improves, approaching a positive 3% by 2030. North Europe's large current account surplus declines markedly but still remains above 2% by 2030. Hence, the appreciation of the real exchange rates of these two blocs does not prevent them from running surpluses.

The current account deficits of South Europe, East Europe and the UK all progressively improve as a result of the depreciation of their real exchange rates. All of them approach or slightly exceed a zero balance by 2030.

However, almost from the beginning of the scenario, the US continues to slide into deeper current-account deficits, closing in on a -4% deficit by 2030. Hence, in order to correct this trend, the US dollar would need to be substantially depreciated, instead of being merely prevented from appreciating.

Our results suggest that domestic price inflation is not the driving force of the appreciation of the US real exchange rate since the rate of change of the price deflator for US domestic expenditures averages less than 2% during 2015-30 (**Table V.9**)

*Table V.9 Employment Scenario: Domestic Prices,
Average % Change (2000-2030)*

Employment Growth Scenario: Domestic Prices (exp. Deflator) annual % change								
Bloc	Bloc Code	2000-08	2008-09	2009-10	2010-11	2011-12	2012-15	2015-30
North Europe	eun	2.3	1.7	1.8	2.9	1.6	1.5	0.6
West Europe	euw	1.7	0.1	0.9	2.2	1.8	1.8	1.2
UK	uk	2.6	1.8	3.4	4.3	3.0	3.4	2.8
South Europe	eus	3.0	0.4	1.0	2.0	1.5	2.3	2.7
East Europe	eue	5.2	2.1	1.9	3.0	3.2	4.1	3.9
USA	us	2.8	0.2	1.7	2.7	1.3	0.9	1.7

Domestic price inflation also remains relatively subdued across the European blocs. For example, during 2015-2030, it averages a low 1.2% in West Europe, and a lower 0.6% in North Europe. But in East Europe, the UK and South Europe, average inflation is higher: 3.9%, 2.8% and 2.7%, respectively.

However, none of these inflation rates suggest that our proposed combination of an employment-focused fiscal stimulus and sharp depreciation of the real exchange rate would cause inflation to become unusually high.

V.5 Summary of the Employment Scenario

In this Section we have presented the results for various European blocs of a policy-oriented scenario generated by the CAM global macroeconomic model. The two defining features of this scenario are: 1) a proactive employment-focused fiscal stimulus and 2) management of the real exchange rate.

The first feature might appear counter-intuitive since the current focus on fiscal consolidation across Europe is generally interpreted to imply sharp reductions in government expenditures instead of systematic increases. Yet it is also being increasingly recognized now that austerity measures do not constitute any kind of growth strategy. Without such a strategy, continuous belt-tightening cannot, in fact, significantly lower the debt-to-GDP level because the denominator of this ratio is markedly decreasing. And if GDP is decreasing, then net government income is likely to follow suit, worsening, in the process, the net-lending position of the government.

A second distinctive feature of our scenario is that fiscal expansions are not geared to achieve GDP growth per se, but rather employment growth. In addition, the character of government expenditures is designed explicitly to boost private investment, not dampen it. So, together, the expansion in government expenditures (primarily public investment) and private investment are able to drive economic growth. And this economic growth is designed to create a higher employment rate.

Our scenario is also distinctive for acknowledging the need to significantly increase government revenue in order to contain fiscal deficits. Such an increase is especially important since revenue levels remain at historically low levels across Europe and the US in the wake of the global financial crisis.

Another distinctive feature of our scenario—which is no doubt as controversial as its employment focus—is the active management of the real exchange rate of each European bloc. This implies dissolution of the Eurozone in its present form, which is based on a common nominal exchange rate in both West and South Europe.

Of course, if management of the real exchange rate is going to be successful, it will still have to depend on coordinated efforts across Europe. This coordination will not only involve a larger number of blocs than just West and South Europe but must also acknowledge the persistent differentials in the levels of productivity, or competitiveness, across all blocs. So, while the common currency of the Euro is abandoned, it is being replaced by wider coordination of the real exchange rate across Europe as a whole.

Such an arrangement should help avoid the single-minded recourse to the drastic depression of domestic living standards, which is now becoming pervasive, for example, across South Europe. The adjustment of each bloc's real exchange rate will help relieve some of the inevitable pressure to resort to domestic price deflation as the primary vehicle to eventually restore international competitiveness.

In our future work, we will investigate further various policy options based on targeting significant increases in employment as our primary objective. This could include retaining, for example, the Eurozone. It could also include the imperative of substantially reducing the debt burdens of countries in South Europe.

One of our primary concerns, for example, is how to deal with the growing problem of youth unemployment in Europe. Solving this 'youth' problem, we believe, will contribute decisively to addressing the potential financial burden prompted by the progressive ageing of the European population.

VI. CONCLUDING REMARKS AND DIRECTIONS OF FUTURE RESEARCH

Deliverable 4.3 has changed direction compared to that pursued by Deliverable 4.2. Whereas Deliverable 4.2 had concentrated on econometric exercises in order to determine systematic relationships between demographic variables and macroeconomic variables, this Deliverable has focused more directly on the relationship between the age structure of the population and employment, and has primarily used the Cambridge-Alphametrics Model in order to make various projections until 2030 on four forms of dependency.

These forms of dependency include young dependants (14 years of age or younger), elderly dependants (65 years of age or older), working-age persons who are economically inactive and working-age persons who are active but unemployed. We combine these four forms of dependency into a combined variable, the Economic Dependency Ratio.

We have concentrated our attention on comparing trends in 'demographic' dependence (young and elderly) and trends in 'employment' dependence (inactive or unemployed). In some cases, such as comparing trends in Europe to those in North Africa and West Asia, we have also disaggregated demographic dependence into its two components, the dependence of the young and the dependence of the elderly. For instance, North Africa and West Asia do not have a problem of population ageing but they do have a relatively large young population that needs to be productively employed.

In investigating the relationship between the age structure of the population and the level of employment, we have used the four main scenarios developed for the AUGUR project. Two of the scenarios—i.e., the 'Reduced Government' scenario and the 'China-US Intervention' scenario—do little to solve the problem of population ageing in Europe. But the two more globally 'policy-ambitious' scenarios—namely, the 'Regionalisation' scenario and the 'Multipolar Governance' scenario—make significant contributions to solving this problem. Both substantially reduce the Economic Dependency Ratio.

When we apply the four major scenarios to North Africa and West Asia, we also find that the 'Regionalisation' scenario and the 'Multipolar Governance' scenario help to reduce the Economic Dependency Ratio. But the level of dependency in the NAWA region remains relatively high in our projections. A minority of women enter the labour force and become employed. Moreover, many young workers are unable to find decent jobs and many young people are economically inactive. These findings suggest that more ambitious employment-promoting economic measures will be needed in order to significantly reduce dependency in this region. For Deliverable 4.4, we will explore the viability of various such options.

For the European blocs that are identified in the CAM database, we have undertaken an explicitly employment-focused scenario that produces promising results. Such a scenario has been based on ambitious fiscal expansion tied to fostering more private investment and complemented by increases in net government revenue and management of the real exchange rate. The employment targets of this scenario are reached by 2030 while fiscal deficits, current-account deficits and inflation are held in check.

In our future research for Deliverable 4.4, we will seek to both fine-tune this scenario and explore other potentially viable policy options. This effort will also involve utilising the three new scenario sub-variants of the AUGUR project ('EU Breakup', 'Federal Europe' and 'Multi-Speed Europe') to explore the results for the Economic Dependency Ratio.

A major focus of our research for Deliverable 4.4 will involve a much more explicit focus on youth inactivity and youth unemployment—in both Europe and North Africa and West Asia. We will also attempt to link the efforts to solve these 'youth' problems with the efforts to deal with the problem of population ageing. Our assumption is that these two problems are tied together. In other words, substantially solving the problem of youth inactivity and unemployment will likely go a long way towards solving the problem of ageing.

In addressing the problem of population ageing, we will also explore complementary initiatives that could be usefully employed. These could include, for example, increasing net migration into Europe. We will also investigate the impact of raising the retirement age for workers since life expectancy is projected to continue increasing in the future. It is conceivable that a combination of various such measures—i.e., providing substantially more youth employment, increasing net migration and raising the retirement age—would adequately address the various challenges posed by population ageing.

VII. REFERENCES and DATAS SOURCES

Birdsall, N., A. Kelley and S. Sinding (2001), Population Matters: Demographic Change, Economic Growth, and Poverty in the Developing World. Oxford: Oxford University Press.

Bloom, D., D. Canning and G. Fink (2009), 'The Graying of Global Population and Its Macroeconomic Consequences.' Paper presented at a Royal Society of Edinburgh Research Workshop, July 2009.

Caselli, G., G. Wunsch and J. Vallin (2005), Demography: Analysis and Synthesis (A Treatise in Population). London: Academic Press. (Chapter 20: Population Models)

Hilderink, H. (2000), World Population in Transition: An Integrated Regional Modeling Framework, Amsterdam: Thela Thesis.

Howell, D. (2002) 'Increasing Earnings Inequality and Unemployment in Developed Countries: Markets, Institutions and the Unified Theory'. CEPA Working Paper 2002-01, New School University.

Islam, I. (2003) 'Avoiding the Stabilization Trap: Towards a Macroeconomic Policy Framework for Growth, Employment and Poverty Reduction.' Employment Paper 2003/53, International Labour Organisation, Geneva.

IMF (2004), World Economic Outlook: The Global Demographic Transition, Chapter 3, September 2004.

Kapsos, S. (2005) 'The Employment Intensity of Growth: Trends and Macroeconomic Determinants.' Employment Strategy Papers 2005/12, International Labour Organisation, Geneva.

Mason, Andrew (2005). 'Demographic Transition and Demographic Dividends in Developed and Developing Countries', paper for the United Nations Export Group Meeting on Social and Economic Implications of Changing Population Age Structure', Mexico City, 31 August – 2 September, UN Population Division.

Muqtada, M. (2003) 'Macroeconomic Stability, Growth and Employment: Issues and Considerations Beyond the Washington Consensus.' Employment Paper 2003/48, International Labour Organisation, Geneva.

Palley, Thomas (1991).

Preston, S., P. Heuveline, and M. Guillot (2001), Demography: Measuring and Modeling Population Processes. Oxford: Blackwell Publishers.

Data Sources

International Labour Organisation (2007) 'ILO/KILM Database'.

<http://laborsta.ilo.org/>

UN World Population Prospects: The 2008 Revision.

<http://esa.un.org/unpp/>

U.S. Census International Database

<http://www.census.gov/ipc/www/idb/informationGateway.php>

EUROSTAT

VIII. APPENDIX 1

EMPLOYMENT GROWTH SCENARIO PROGRAMMING

```

=====
' RULE DEFINITIONS
=====

smpl %actual+1 %end

call DropRules("G_EUS G_EUE G_EUW G_EUC G_EUN")
call DropRules("SP_EUE IP_EUE SP_EUW IP_EUW")
call DropRules("rxu_EUS rxu_EUE")
call DropRules("G_EUS_a")
call DropRules("IAGO_EUN_a")

G_EUE_ins=0.025
IAGO_EUN_ins=-0.04

call Target("IP_EUE", "(IP_EUE/VV_EUE)", "0.17", 0, 15)

'--- Employment target US and Europe
call Floor("G_US", "(NE_US/NWP_US)", "0.72", 0.12, 20)
call Link("IP_US", "G_US", 0.25)
call Floor("G_EUS", "(NE_EUS/NWP_EUS)", "0.62", 0.14, 20)
call Link("IP_EUS", "G_EUS", 0.5)
call Floor("G_EUC", "(NE_EUC/NWP_EUC)", "0.70", 0.15, 20)
call Link("IP_EUC", "G_EUC", 0.4)
call Floor("G_EUW", "(NE_EUW/NWP_EUW)", "0.73", 0.11, 20)
call Link("IP_EUW", "G_EUW", 0.4)
call Floor("G_EUN", "(NE_EUN/NWP_EUN)", "0.74", 0.2, 20)
call Link("IP_EUN", "G_EUN", 0.25)
'call Floor("G_EUE", "(NE_EUE/NWP_EUE)", "0.60", 0, 20)
'Call Link("IP_EUE", "G_EUE", 0.25)

'--- NFI bank lending stimulus
NFI_US_ins = 0.05
NFI_EUS_ins = 0.05
NFI_EUC_ins = 0.05
NFI_EUW_ins = 0.05
NFI_EUE_ins = 0.05
NFI_EUN_ins = 0.05

'--- Revenue Increase US and Europe
Call Target("YG_US", "YG_US/VV_US", ".20", 1, 30)
call Target("YG_EUS", "YG_EUS/VV_EUS", ".23", 1, 30)
call Target("YG_EUC", "YG_EUC/VV_EUC", ".25", 1, 30)
call Target("YG_EUW", "YG_EUW/VV_EUW", ".25", 1, 30)
call Target("YG_EUN", "YG_EUN/VV_EUN", ".28", 1, 30)
call Target("YG_EUE", "YG_EUE/VV_EUE", ".21", 1, 30)

'--- RER Adjustment US and Europe
call Ceiling("rxu_US", "rx_US", "1.0", 0.7, 100)
call Target("rxu_EUS", "rx_EUS", "0.75", 1.14, 100)
call Target("rxu_EUW", "rx_EUW", "0.9", 1.07, 100)
call Target("rxu_EUC", "rx_EUC", "1.3", 1.06, 100)
call Target("rxu_EUN", "rx_EUN", "1.7", 1.5, 100)
call Target("rxu_EUE", "rx_EUE", "0.55", 0.63, 100)

call Limit (95, "ALL")
=====
' PROCESSING'=====

```