EUROPEAN
POLICYBRIEF

ADAPTING TO POPULATION AGEING: THE WELFARE STATE REFORM

Analysing the future consequences of public reforms in the light of population ageing requires projecting the evolution and interaction of key demographic and economic indicators. The strategy followed in the AGENTA project is going backwards to understand past historical demographic changes and behavioural responses in order to properly project the future economic consequences of population ageing. Overall, our simulations allow us to investigate the extent to which the pressure exerted on the welfare state is mitigated by timely human capital investments, which help extending employees' working lives and improve their productivity. The secular increase in life expectancy together with the delayed entry into the labour market due to a longer education period clearly imply that increasing the retirement age becomes not just a necessary but a natural way to adjust for ageing.

September 2017

INTRODUCTION

To analyse and project future challenges of the population ageing process, it is crucial to understand the economic impact of past changes in the demographic structure and the transfer system. Population ageing is usually associated with a slowdown in economic growth, since the number of workers supposedly declines while the number of dependent persons is expected to increase. As a consequence, this process raises concerns about the sustainability of current welfare state programmes. However, economic growth is also determined by the growth rate of the production per worker. This crucial link is affected not only by changes in the age structure of workers but also by compositional changes in the working-age population (e.g. gender, education) and by behavioural responses to the new demographic and economic circumstances—e.g. a longer retirement period needs to be financed by higher savings and an increasing labour supply. Since the supply of labour and capital will also change, wages and interest rates will vary as well. Hence, a shift-share analysis, which does not consider behavioural responses and changes in wages and interest rates, is inadequate to fully understand the implications of the ageing process on economic growth and on the future evolution of public transfer systems. Thus, we develop a demographic/economic model in which individuals differing in educational attainment decide about their consumption, labour supply and savings. The model replicates the main macroeconomic indicators of three European countries (Austria, Spain and Sweden) from 1870 to 2015 and takes into account the evolution of two main public transfer programmes—i.e. publicly provided education and pension expenditures.

The role of past changes in age structure and education on economic growth

The unprecedented economic growth (i.e. increase in per-capita income) observed in western European countries during the last century and a half was accompanied by a change in the age structure of the population, known as the demographic transition, and by the expansion of the educational system. Thus, past changes in population age and educational structure are related to many of the economic outcomes that we currently observe. The strategy followed in the AGENTA project is to understand the behavioural responses to these historical changes in order to properly project the economic consequences of population ageing, taking into account those behavioural responses.

Using an Overlapping Generations (OLG) model (Sánchez-Romero et al. 2016, 2017), we assess the impact of demography on several macroeconomic indicators and especially on per-capita income growth. Demographic changes can produce a demographic dividend (i.e. higher per-capita income) either when the working-age population grows faster than the dependent population or when it induces an increase in the productivity per worker, but it can also cause a demographic burden when the opposite effects occur. Figure 1 shows the contribution of changes in age structure and educational expansion to per-capita income growth in three European countries (Austria, Spain and Sweden). These countries are good representatives of the economic and demographic patterns as observed in central, southern and northern Europe, respectively. The total height of the bars in Figure 1 shows the total per-capita income growth rate observed during the period 1870–2014 and the projected growth from 2015 until 2100. Colours blue and orange show the per-capita income growth associated with changes in the age structure and in the educational attainment of the population, respectively, while the grey colour represents the contribution of all other factors. The sum of the blue and orange bars suggests that demography, i.e. changes in population size and composition, accounts for at least around 25 per cent of the total per-capita income growth during the period 1870–2014. Figure 1 shows a smaller impact of demography on the per-capita income growth during the 21st century. This is explained by a small negative effect of the change in the age structure of the population on per-capita income and a positive effect of education, especially in countries like Spain with a late introduction of public upper secondary and tertiary education. The small impact that education will have on per-capita income growth in Sweden during the 21st century is explained by the already low inequality in labour income across educational groups which implies that the educational expansion will not produce an increase in the productivity per worker. Our simulation suggests that education, rather than the age structure of the population, will have the biggest influence on economic growth in the future. Hence, we find that the future demographic dividend can only be an **educational dividend**.
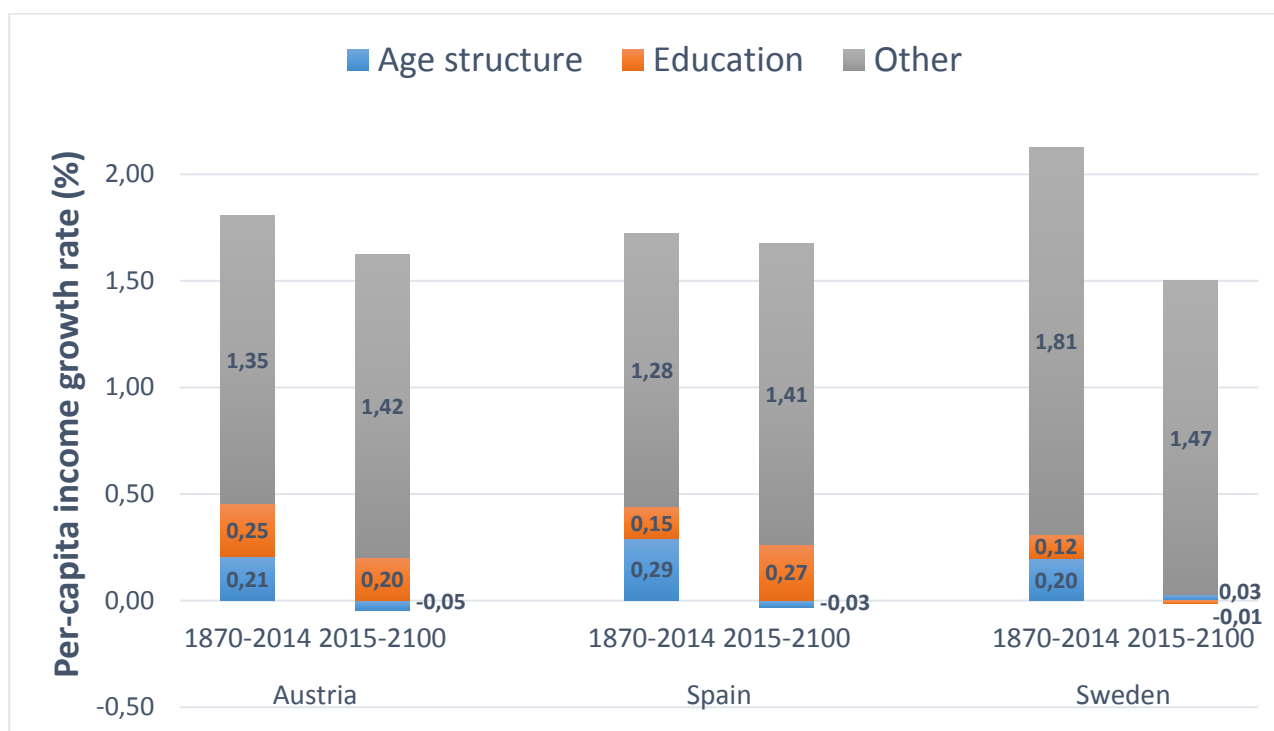
Figure 1: Source of per-capita income growth during the period 1870–2100 in Austria, Spain and Sweden

Facing the future: the effect of an increase in the retirement age

In addition to understanding the impact of past changes in demographics on income growth, the model allows us to project the evolution of taxes and pension contributions that are necessary to finance the public transfer system. It also allows us to run simulations about alternative policies on the sustainability of the welfare state. For instance, during the last two decades many governments have introduced policies aiming at increasing the average retirement age so as to reduce the cost of the public pension system for future workers and to guarantee the sustainability of the system. The impact of this policy on the future evolution of per-capita income is key for understanding its economic consequences. We approach this question by running two alternative simulations. In the first scenario we keep the retirement age at 65, while in the second scenario we implement an increase of the retirement age from 65 to 70 over the period 2020–2040.

Table 1 shows the economic impact of increasing the retirement age from 65 to 70 in Austria, Spain and Sweden. In particular, Table 1 shows the increase in per-capita income and the evolution of the pension cost as a percentage of GDP from 2010 to 2070. In order to simulate this policy, the government is assumed to increase the retirement age linearly from 65 up to age 70, starting in year 2020 (phase-in) and concluding in year 2040 (phase-out). Moreover, pension benefits are adjusted downwards when the social security contribution rate exceeds 35 per cent. Table 1 illustrates how policy under this setting has a moderate impact both on per-capita income and on the total cost of pensions by year 2070. However, this policy substantially reduces the burden of population ageing by the year 2040. Specifically, the total cost of public pensions as a fraction of GDP is reduced by 3.6 (=21.3-17.7) percentage points in Austria, by 6.7 percentage points in Spain and by 2.5 percentage points in Sweden. Per-capita income also increases in 2040 by 4 ((=158.9/152.8-1)*100) per cent in Austria, by 13.8 per cent in Spain and by 4 per cent in Sweden.

Table 1: Economic impact of increasing the retirement age in Austria, Spain and Sweden

YEAR	Retirement age 65		Retirement age 70	
	Per-capita income (2010=100)	Pension to output %	Per-capita income (2010=100)	Pension to output %
AUSTRIA				
2010	100.0	12.4	100.0	12.4
2040	152.8	21.3	158.9	17.7
2070	254.8	21.8	256.1	20.5
SPAIN				
2010	100.0	9.2	100.0	9.2
2040	156.0	21.9	177.5	15.2
2070	261.1	21.2	263.5	19.8
SWEDEN				
2010	100.0	7.2	100.0	7.3
2040	150.6	9.5	156.6	7.1
2070	245.6	10.8	254.4	8.4

References

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POLICY IMPLICATIONS AND RECOMMENDATIONS

Simulating and projecting the reforms of public transfers is crucial for assessing its redistributive effect, its efficiency and its impact on economic growth. In general, a standard shift-share analysis is insufficient for a proper assessment of these reforms, since individuals will react to a longer and healthier retirement period by changing their behaviour. It is therefore necessary to develop models that do not only account for changes in the age structure of the population but also for the behavioural reactions of individuals to the new economic and demographic environment. These models must be able to explain the economic consequences of past changes in the age structure and in the transfer system.

We find that changes in the age structure and educational composition of the population account for 25 per cent of the observed per-capita income growth during the period 1870–2014 in Austria and in Spain. In addition we also find that education will be an important driver of future economic growth

from 2015 to 2100, while the change in the age structure will have a small negative effect in the future.

Within our model we can also study reform scenarios of the public transfer programme. To reduce the burden of public pension programmes on future workers, governments are introducing policies that extend the normal retirement age above age 65. We find that this policy helps to substantially reduce the economic burden on the pension system around year 2040, while its effect is not as important when the baby boom generations disappear.

Overall, our simulations allow us to investigate the extent to which the pressure exerted on the welfare state by an ageing population might be compensated by human capital investments, which result in higher productivity and extended working lives. The secular increase in life expectancy together with the delayed entry into the labour market due to a longer education period both imply that increasing the retirement age becomes not just a necessary, but a natural way to adjust for ageing.

RESEARCH PARAMETERS

The AGENTA project aims at explaining the past and forecasting the future of taxes and public transfers and services in the light of demographic change in the European Union. AGENTA puts a special emphasis on the links between the public and the private sectors (particularly households) in providing transfers to children and elderly persons. The guiding principle of the project is to provide evidence-based policy proposals to ensure the long-term sustainability of public finances in Europe.

A central component of AGENTA is the generation of National Transfer Accounts (NTA). NTAs introduce the age dimension into the System of National Accounts (SNA) and measure age-specific income, public and private transfers between age groups, as well as the age-specific use of disposable income for saving and consumption.

PROJECT IDENTITY

PROJECT NAME	Ageing Europe: An application of national transfer accounts (NTA) for explaining and projecting trends in public finances (AGENTA)
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FUNDING SCHEME	FP7 Framework Programme for Research of the European Union – Collaborative project – Socio-Economic Sciences and Humanities – Thematic area: The impact of ageing societies on public finances in Europe
DURATION	January 2014 – December 2017 (48 months)
BUDGET	EU contribution: EUR 2,496,850
WEBSITE	www.agenta-project.eu
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FURTHER READING

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