Extending Working Lives in Europe

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Abstract The European economies face aging populations without adequate savings to fiancé pensions. The length of retirement has risen since 1950, but savings do not appear to have increased in line. This suggests that incomes in retirement may be less adequate than people expect. Survey evidence suggests people underestimate their life expectancy and hence save too little. The paper analyses a change in the perception of lives on savings, and also looks at the impacts of an extension of working lives in the UK and the Euro Area. A distinction is drawn between the impacts of these changes on output (GDP) and income (GNP) in open economies with capital mobility.

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Introduction

European economies face significant problems in relation to their aging populations, and in particular the level of private sector saving is widely regarded as being too low and the scope of government commitment to pension payments as too high. In most European countries the population is projected to decline and the ratio of those above working age to those of working age is expected to rise markedly. In others, such as the UK, the population is expected to continue to increase, but there are other problems to address associated with the increase in the proportion of the population above retirement age. Khosam and Weale (2008) investigate the savings shortfall in relation to pensions in a number of European economies, and conclude that there is a problem to be addressed. Our results build on their analysis. Economists are careful in the use of the term 'too little' in relation to the outcomes of the decisions of optimising agents, and if we think there is a market failure, we have to describe that failure. Agents who are saving for retirement have to make decisions on the date at which they retire, the level of savings during their working lives and the level of consumption they will undertake when retired as well as whilst working. They may have inadequate savings because of misperceptions about their life expectancy or about the provision of publicly funded goods or money, such as health services and retirement pensions. Changes in those perceptions will change behaviour.

Analysing individual optimising decisions in a macro economic context is difficult, especially as the most commonly used overlapping generations models do not aggregate. This paper looks at changes in retirement ages and in perceptions of expected life using the National Institute's rational expectations global macro model, NiGEM. The first section discusses the implications of the model of perpetual youth discussed in Blanchard and Fischer (1989) for the analysis of savings behaviour. This form not only allows us to aggregate across consumers to produce an equation we can use in a macro model, but also allows us to investigate analytically as well as empirically the implications of a change in expected life. This section also discusses the supply side of the model and other features that structure the outcomes of the simulations, and in particular looks at the importance of the assumption that the economy is open with mobile capital. The next section goes on to analyse the implications of a change in expected life[2] for savings, output and incomes, using NiGEM with fully forward looking consumers. The major focus of the paper is on the impact of extending working lives on output, incomes and saving in the UK and the Euro Area. The model simulations for the UK on these two topics are then brought together to evaluate the overall impacts of a change in the perception of longevity in the UK accompanied by an extension of working lives. We build up the final simulation by parts in order that the overall effects of the policy package can be more clearly understood.

Extending working lives implies inducing older people to work longer, and they may choose to work fewer hours, and they may be less productive than average workers. It is assumed that older workers are not less productive per person hour, but that they work around two thirds of average hours. It is possible to look at the adequacy of our assumptions that extending working lives does not affect average productivity. Survey evidence from the UK indicates that although hours and incomes decline after the age

[2] A distinction is drawn between expected life, which we see as a perception held by individuals and can be incorrect, and life expectancy, which is an actuarial concept,

of 45, earnings per hour do not, and hence we can assume that increasing working lives does not affect average productivity. Extending working lives means that a lower stock of saving is needed, and the implications for incomes depend in part on the rate of return on assets. Increasing the work force will require that capital accumulates and more assets become available to own, but fewer are demanded by domestic residents. In a closed economy the increase in desired capital and the fall in saving would mean the rate of return on assets would rise, whilst in an open economy it means that the stock of net foreign assets will decumulate, and the rate of return will stay (approximately) the same. In an open economy an increase in working lives is associated with a fall in the current account surplus (or increase in the deficit). A distinction is drawn between the effects on a small open economy, such as the UK, where there are no (noticeable) effects on world real interest rates and a large open economy such as the Euro Area, where there are feedbacks onto real rates of return.

The modelling framework

We utilise the NiGEM model which can be used in various ways. In this paper we use a version that is similar to the Dynamic Stochastic General Equilibrium models in use by institutions such as the Bank of England[3]. Output (Y) is determined in the long run by supply factors, and the economy is open and has perfect capital mobility. The production function is CES, where output depends on capital (K) and on labour services (L) which is a combination of the number of person in work and the average hours of those persons. Technical progress (tech) is assumed to be labour augmenting and independent of the policy innovations considered here

$$Q = \alpha(\delta(K)^{-\rho} + (1-\delta)(Le^{\lambda_L tech})^{-\rho})^{-1/\rho}$$

We assume forward looking behaviour in production and because of 'time to build' issues investment depends on expected trend output four years ahead and the forward looking user cost of capital. However, the capital stock does not adjust instantly, as there are costs involved in doing so. The equilibrium level of unemployment is given by the bargain in the labour market, as discussed in Barrell and Dury (2003), and the speed of adjustment depends on (rational) expectations of future inflation. Financial markets follow arbitrage conditions and they are forward looking. The exchange rate, the long rate and the equity price will all 'jump' in response to news about future events. Fiscal policy involves gradually adjusting direct taxes to maintain the deficit on target, but we assume that this has no direct effect on the labour supply decision. Monetary policy involves targeting inflation with an integral control from the price level, as discussed in Barrell, Hall and Hurst (2006) and inflation should settle at its target in all our simulations.

Perhaps the most important feature of the model for our discussion is that consumers react to the present discounted value of their future income streams which we may call total wealth (TW), although they may face liquidity constraints from their personal disposable income in the short run. Total wealth is defined as

$$TW_t = Y_t - T_t + TW_{t+1}/((1+rr_t)(1+my_t))$$

[3] The Bank of England Quarterly model is discussed in .Bank of England (2006)()

where TW is real total wealth, Y is real income, T are real taxes. The variable with suffix t+1 is an expected variable, and it is discounted by the real interest rate I and by the premium faced by consumers, *my*. The equation represents an infinite forward recursion, and permanent income is the sustainable flow from this stock. The dynamics of adjustment may depend on financial and housing asset based wealth. Total wealth and permanent (PI) income can be linked by the stock flow relationship where γ is the rate of return on the perpetuity TW.

$$PI_t = \gamma * TW_t$$

Although consumers know their total wealth and hence their permanent income, they may not consume it all as they are either risk averse or face a probability of death (ρ) in each time period and also a probability (τ) that they will make the transition from working to not working. If life expectancy is uncertain, then consumers will have precautionary savings as discussed in Blanchard and Fisher (1989). In addition during working years they save and use their interest income and run down assets in retirement, and hence the saving rate out of current income will depend on the annuity rate, which in turn rises with the probability of retirement taking place in any year. The steady state saving rate will also depend on the other determinants of the annuity return, including the real rate of return to capital in the economy and the rate of growth, both of which will reduce required saving if they increase. We may call the annuity related saving rate out of permanent income β, and hence the marginal propensity to consume out of TW in relation to retirement needs can be written λ=γ*(1-β). Khoman and Weale (2008) show that in the steady state an increase in working life of one year with given life expectancy will reduce saving rate by around 0.6 percentage points.

Consumption out of TW will depend on the probability of death and on the annuity elated marginal propensity to consume. Consumers may also put a premium θ on future consumption. The Blanchard and Fisher (1989) model of perpetual youth is a useful abstraction as it allows us to build on an analysis of annuity related saving and to aggregate across consumers. In particular it allows us to analyse the impacts of changes in expected life on the savings decision. In this model the long run marginal and average propensity to consume (MPC) can be derived from the relationship between consumption C_t and total wealth TW_t which is the net present value of all future incomes,

$$C_t = (\theta + \rho + \lambda))(TW_t)$$

If the probability of death declines then consumers will reduce consumption now, whilst if total wealth goes up they will increase their consumption. If the probability of retirement goes down, consumption will also rise. If consumers become less cautious about their prospects, consumption will rise.

Total wealth will also change when asset prices change. Non-human wealth may rise when, for instance house prices rise, and this may increase consumption even though real output may not have risen. Real house prices are net wealth under exactly the same conditions as government bonds, and hence changes in asset prices can affect consumption. This may indeed be one reason why saving has been so low in the UK. Consumers also have to make a decision on the consumption of goods and leisure, and hence we can see the timing of retirement to be at least in part a consumption or

leisure choice. If expected life rises but the average age of retirement does not then the timing of consumption changes, which requires more saving whilst in work to finance more consumption during retirement. One might expected a change in expected life to impact on the retirement decision. In our discussion below we first analyse the impacts of a change in working life with no change in retirement age, then a change in the retirement age with no change in expected life and then we combine the two.

Changing perceptions of life expectancy in the UK

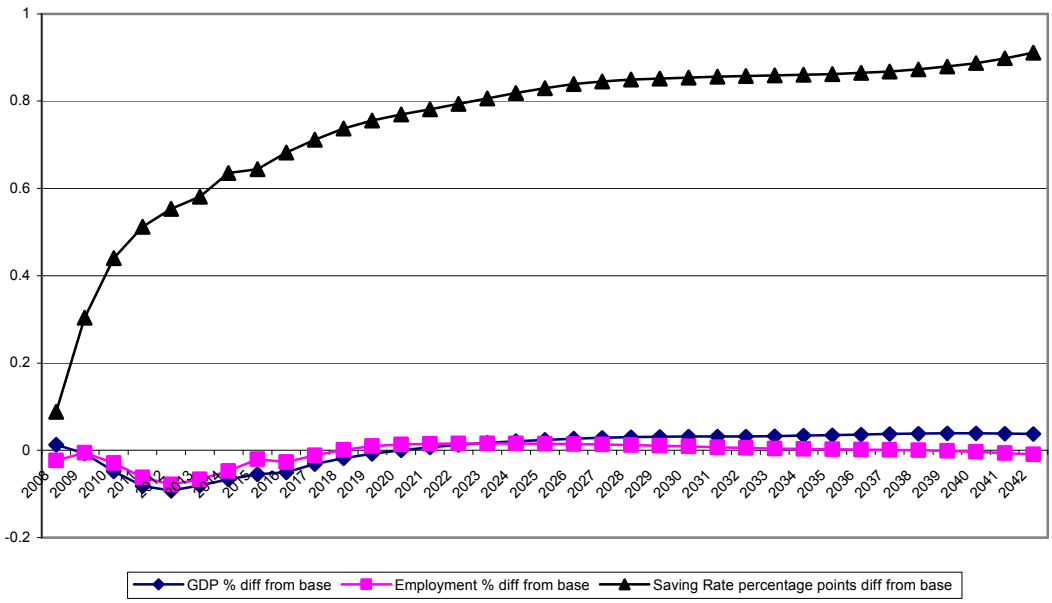
Between 1950 and 2005 the average age of retirement for men in the UK fell from 67 to 64 (it was less than 63 in 1995) and for women it fell from 64 to 62 (after being below 60 in 1995). Over the same time life expectancy at 65 has risen by 9 years, giving men 12 extra years of retirement. However, it is clear that individuals have not fully kept up with their increased life expectancy, and survey evidence suggests that people expect to die rather earlier than their statistical life expectancy would suggest. Men aged between 50 and 59 underestimate their life expectancy by almost 4 years and women underestimate theirs by around 5 years. For the 60 to 69 age group the numbers are almost 3 years for men and over 4 for women. It is therefore not surprising that actual saving is lower than individuals need, and part of the reason for raising retirement ages is to help change perceptions and bring expected of life into line with life expectancy.

If the campaign to raise awareness is successful, and people realise they will live longer than they currently believe, savings will rise. We can use our model to analyse the impacts by raising expected life by one and a half years, which is chosen both for the UK and the Euro Area to be equivalent to a one year increase in working lives if the ratio of work to retirement is expected to remain constant. The impacts depend how quickly the realisation of longer expected life is absorbed in the population and we assume it takes 10 years for the full perception of longer expected lives to sink in fully. The rise in saving this would generate is accompanied by an initial decline in consumption, as it takes time for increased saving to generate higher incomes, and after 6 years or so consumption would be more than one per cent below baseline. Higher saving would generate assets, and incomes would rise as the assets would provide a revenue stream.

In a model of a small open economy with forward looking behaviour the effects on output in the short to medium term are limited, as we can see from Figure 1, which plots the difference of employment and output from baseline. Initially the exchange rate would jump down, as lower demand at home would induce a fall in interest rates, and this would induce a small strengthening of growth, but slower consumption growth would outweigh this after a year or so. Employment settles down around baseline relatively quickly, and unemployment would be at its bargaining determined equilibrium for most of the period plotted, and would rise only marginally in the first few years[4]. The level of output would be marginally higher as even in a small open economy there would be a minor fall in real rates of return, with long real rates falling by less than 0.1 percentage points and the user cost of capital would be about half a percent (or 1/160th) lower.

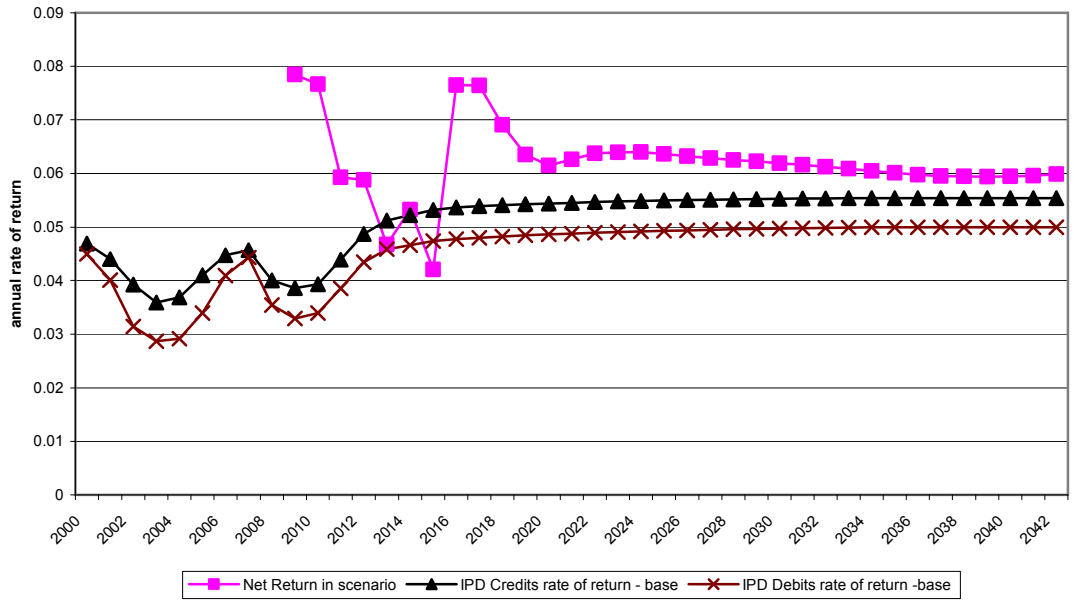
[4] These results are consistent with those in Barrell (2007) which uses a longer baseline.

Figure 1 Raising expected life by 1 1/2 years
effects on UK output, employment and saving



If the increase in saving were to push down the real rate of interest noticeably, as it would in a closed economy, then the equilibrium capital stock and the equilibrium level of output would rise. However, the UK is a small open economy, and the rate of return on capital is determined in world markets and hence the increase in saving is accumulated in foreign assets. This requires that the UK run a balance of payments surplus, and hence the real exchange rate has to be permanently lower. The increase in assets would raise income (Gross National Product or GNP) by more than half a percentage point as compared to baseline. The rate of return on foreign assets is plotted in Figure 2.

Figure 2 UK rates of return
increased saving scenario



Extending working lives[5]

Our analysis above assumes that increases in expected life leads only to higher saving and a change over time in the allocation of consumption. It is highly likely that as people realise that they will live longer they will also choose to work longer. They may of course be fully constrained from doing so by government regulation, but this is unlikely to be the case. Indeed part of the declared intention of raising the state pension retirement age is to raise awareness of life expectancy and persuade people to work longer voluntarily.

The UK government have announced plans to increase the retirement age for both men and women to 68 by 2046. The increase will come in three stages to be completed in 2036 , 2036 and 2046. Evidence from surveys of women in the UK suggest that a change in retirement age induces individuals to begin reacting to the increase in the retirement age ten years before they reach the new retirement age, with those above 55 changing their behaviour with fewer of them taking early retirement.. In the long run output will rise (approximately) in proportion to the increase in the supply of labour, as in a small open economy with capital mobility that factor of production will be available to work with labour at round about the existing capital labour ratio and rate of return. An increase in the supply of labour puts downward pressure on wages and temporarily raises the real return to capital and hence capital inflows will take place until returns are back down at world levels. Net capital inflows require a current account deficit, and this will be brought about by the increase in demand for imports and downward pressure on export prices as supply increases. If no new capital flows were needed these pressures would be absorbed by a fall in the exchange rate, but the supporting capital mean this is not needed.

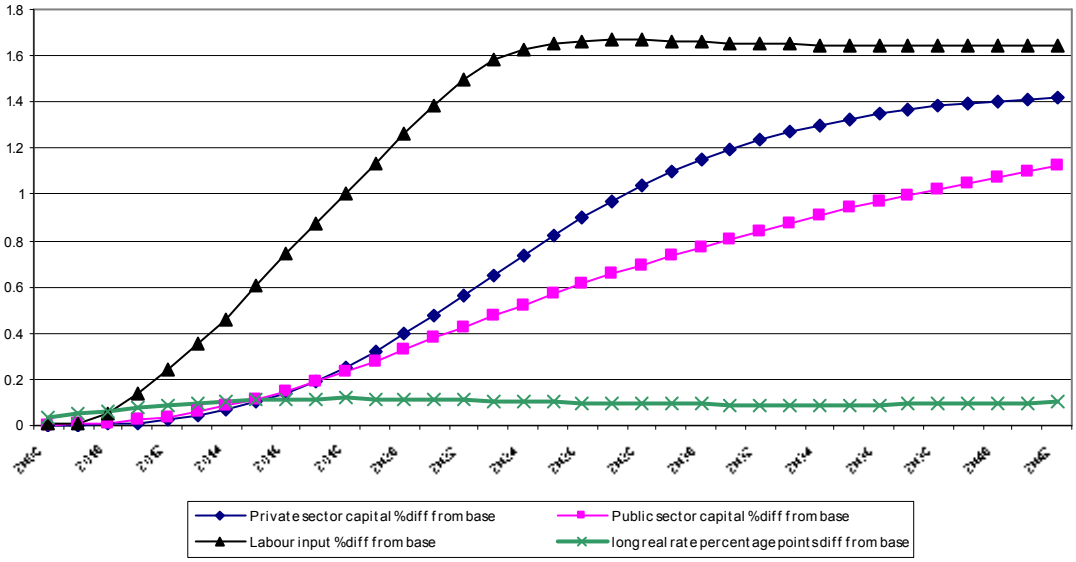
We analyse the impact of a one year increase in effective working life, which is consistent with the one and a half years increase in expected life in the previous section if planned retirement is expected to stay unchanged. Obviously it might be wise to raise expected working lives longer, and the effects can be extrapolated from our results. We assume that the working age population begins to increase one year after the start of the scenario and that it takes 12 ½ years to increase the length of working lives by one percent

As the availability of increased labour is fully anticipated and slow to come through in this simulation, the market adjusts and in our simulation there is virtually no impact on the unemployment rate, which is determined by the wage bargain. Employers have enough time to raise investment in advance of the anticipated increase in labour supply so that the capital stock can grow approximately in line with employment. The business sector capital stock is assumed to be determined by the underlying production function and hence rises in line with employment given any changes in real wages relative to the user cost of capital. If all capital did the same, then output should rise in exactly in line with labour input in the long run, as we would expect from the production function. We assume that government investment rises with expected capacity output, and hence the government capital stock increases more

[5] Although we use the same model as in DWP (2006) we have made different assumptions about the impact of policy on labour market participation.. In particular we assume that the increase in labour input starts 5 years earlier than we did in the DWP simulations, and comes to an end 5 years earlier. This reflects a different interpretation of the impacts of policy, but mot a difference in substance. We assume the same overall impacts on employment and hours as in the DWP central case.

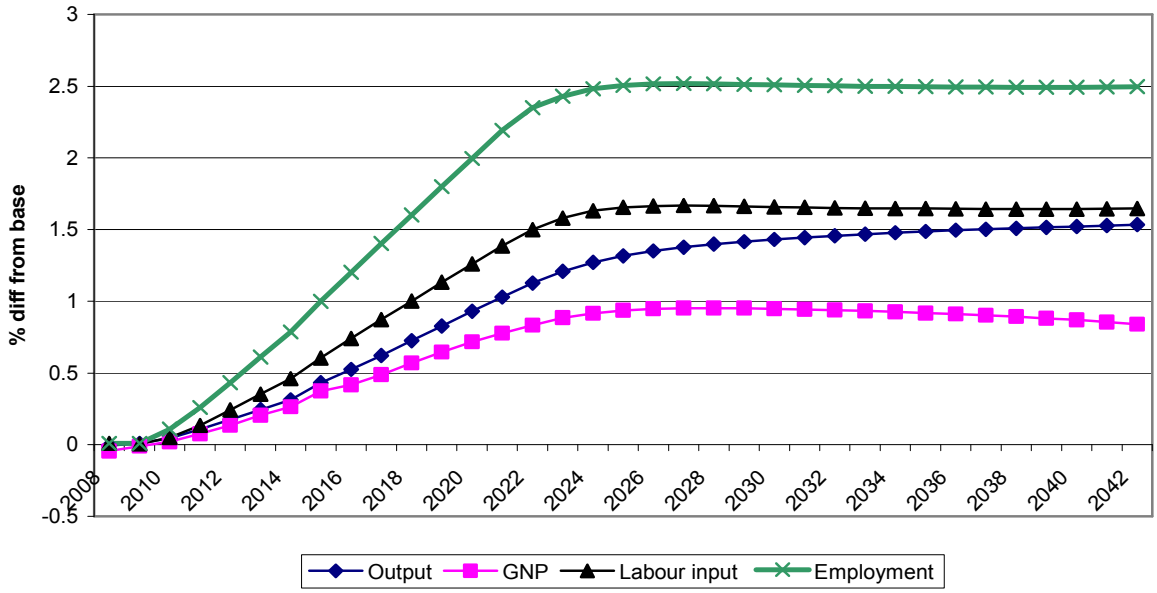
slowly than business sector capital but eventually adjusts. All investment plans are assumed to depend on capacity output anticipated for 4 years ahead as well as the forward looking user cost of capital. As a result of these assumptions the capital stock rises less than the workforce, as we can see from Figure 3. Private sector capital rises less than employment as the increase in demand for capital, and hence the reduction in net saving, puts marginal downward pressure on long term real interest rates and hence on the user cost of capital.

Figure 3 Extending working lives - factor inputs



In this scenario GDP rises marginally less than labour input, and continues adjusting after 35 years. These marginal changes could be smoothed if we assumed the government capital stock moved at the same pace as private sector capital, but we consider it useful to demonstrate the effects of budget rules. Figure 4 plots the impact of an increase in working lives on output and employment as well as on GNP.

Figure 4 Extending working lives - output and income effects

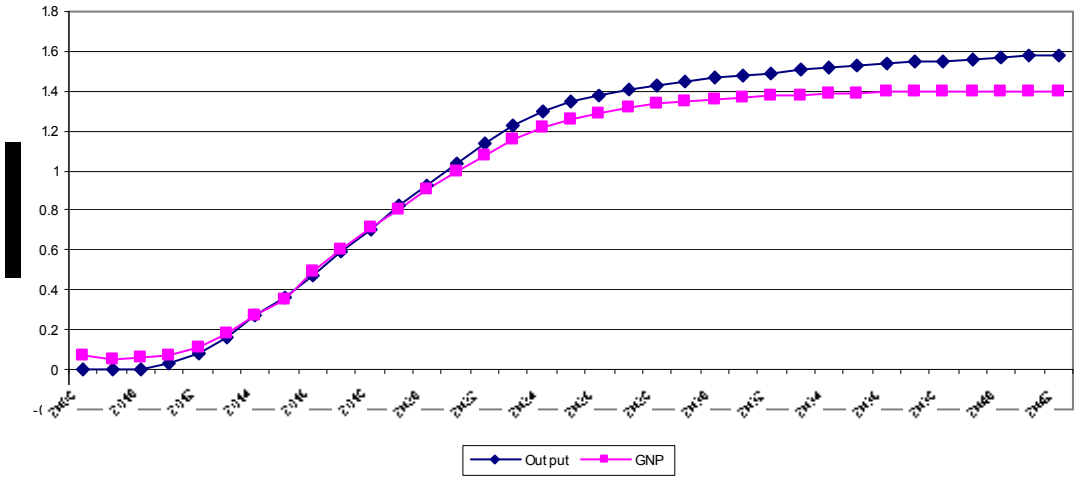


The need to finance capital inflows that go with an increased labour force require current account deficits and hence a build up of foreign liabilities (or a run down in assets). This connection between lower saving, a worse current account and declining net assets is symmetrical to that discussed in the previous section, and the implications for the relationship between GNP and output are the mirror image of those discussed above. The long run results may be much as we might expect, but in the short term an expected or anticipated increase in working lives will reduce savings immediately, albeit by a small amount. Total wealth rises as people anticipate higher future incomes and the effects are brought forward by rational optimising consumers. Total wealth is the net present discounted value of future incomes, and hence current wealth rises. In the short run consumption rises and the saving rate falls, but effects are initially small but build up, as we can see from Figure five. This result is not surprising as populations with longer working lives with a given life expectancy save less because they need less saving to spend in their retirement. As an example we know that US workers have similar life expectancy to the UK and Germany but save less because they work 7 years longer (see Sefton and Kirsanova 2007). In our simulation consumption rises ahead of the increase in activity and incomes because consumers are presumed to face only short term liquidity constraints, and even then these do not apply to the whole population.

Effects of combined EWL and perception of longer life

We can combine our analyses of a change in expected life and a set of policies to extend working lives in order to evaluate the effects of the set of policies and waves of persuasion that are currently being set up. This scenario would reflect the effects desired by the government, and indeed may well be the most likely outcome. We are combining two scenarios with differing effects, and the overall outcome should be approximately the sum of the two. Raising the perception of expected lives raises saving, improves the current account and increases GNP but not GDP, whilst increasing the length of working lives reduces savings, worsens the current account and increases both GDP and GNP, but the former rises more than the latter. Hence we cannot a priori say what direction the effects of the combination are on savings or the current account, but we can say that the effects on GDP and GNP will be positive.

Figure 5 Combining extending working lives and increasing saving output and income effects



Output and employment begin to rise as more labour becomes available, and they continue to increase as compared to baseline as a result of the continuing increase in labour input and they are approximately the sum of the changes in the previous two simulations. Because the absolute impact on savings of increased expected life is by design the same size, but with an opposite sign to that of extended working lives the savings rate hardly changes and hence there is only a small increase in foreign assets. The increase in the long real rate is around one fifth of that in the extended working lives scenario as the marginal increase induced there is almost entirely offset by the decrease induced by the rise in saving.

Productivity, Retirement and the Age Earning Profile

Our analysis of the impact of extending working lives on output depends upon the assumption that productivity does not decline with age. Although it is clear that earnings do peak, and then decline towards retirement, it is not absolutely clear that productivity does the same. Physical strength may decline after 45, but few occupations derive their product purely from this input. Physical dexterity may not decline in quite the same way, and its decline may be compensated for by increases in experience. In addition the majority of occupations of occupations in the UK do not require physical or only semi skilled learning. Robinson (2000) plots the average earnings profiles for British men and women in full time employment broken down by skill levels, with three levels of skill for men and two for women. These are abstracted from the NES, and represent a large sample of the population, and suggest that there is little impact of age, as indexed by years of experience, on full time earnings. Of course, as people approach retirement they may work fewer hours and hence their average earnings will fall, and those who become less productive when they get older are more likely to exit the workforce. However, it appears that those who stay in full time work suffer no productivity loss as they become older.

The age earnings profile may be influenced by regulation and by institutions such as unions. Over the period from which the data are derived there was no effective minimum wage in the UK, and hour regulation was relatively lax. Although trade unions were relatively strong in the first half of the period covered that were more important in male unskilled occupations than they were in either female or skilled groups. There is no evidence that the earnings profiles differ between these groups. In addition, over this period, the UK labour market was probably the closest in Europe to a US style open competitive structure where individuals are paid their marginal product.

There is significant evidence that hours of work do decline as people get older, and in the ten years prior to retirement average hours progressively decline and fewer individuals work full time. Hence the full time earning profile and the overall age earned income profile should differ, and the age earned income profile takes the expected shape and declines in the 10 to 20 years before retirement. Hence our assumption that average productivity does not decline can be defended, and we do allow for a decline in average hours worked in the run up to retirement.

We should treat the assumption of constant productivity with care, as it depends upon the assumption that the extension of working lives takes place in all skill groups. This would be particularly the case if the reason for the extension were purely voluntary and resulted from the campaign to persuade people that their life expectancy exceeded their own expectations of length of life. If the extension of working lives is purely the result of compulsion then our results would differ, and the output effects would be

lower. As Sefton, van der Ven and Weale (2007) show, increasing the compulsory retirement age is likely to have a greater effect on the poorest, and least productive, groups of workers in the economy, as they are more dependent on state retirement pensions rather than their own assets than the average member of the population They show that retirement decisions in the UK depend upon a calculation of the adequacy of assets produce a retirement income, and wealthier groups have more assets and hence choose to retire earlier. Their decisions will not be impacted much by a change in the state retirement age, but would be influenced by a successful campaign to raise awareness of misperceptions of expected lives.

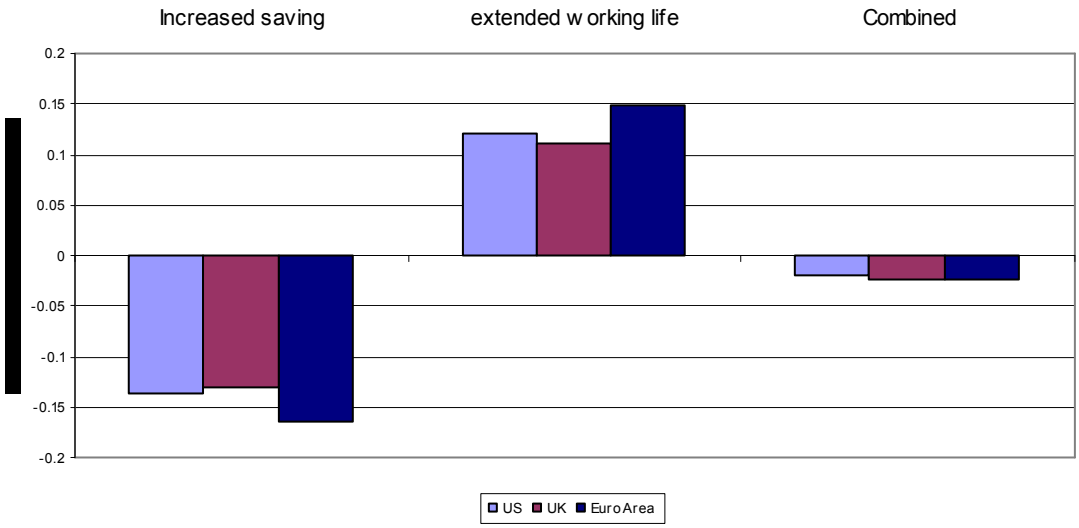
Extending Working Lives and raising saving in the Euro Area

The aging problem is more severe in the Euro Area than in the UK, and the problem of public pensions and their costs is also in general more of a problem. NiGem has a model of each of the 12 main Euro Area countries, and each has a complete supply side and rational expectations. The forward projection of population depends on Eurostat data both for the total population and the breakdown into the population of working age, the retired and those below working age. In each country government transfers to individuals depend on three factors, where ytrend is capacity output in nominal terms, as transfers are also nominal

Transfers=a*ytrend+inactive*replacement rate+pensioners*pension replacement rate

The replacement ratios are uprated with trend output in nominal terms. As a result of the uprating rule and the increase in the dependent population transfers rise as a share of GDP, and taxes rise to finance this in order that governments are solvent. If the retirement age is raised then transfers for pensions are reduced by initially unemployment rises, and the net effect depends on the two replacement ratios. The increase in the workforce is relatively quickly absorbed, and hence government spending is reduced and the direct tax rate falls when retirement age increases.

Figure 7 Effects of scenarios on long real rates (last decade)



We repeat our three experiments for the Euro Area, first by raising saving in each country by shifting down the long run marginal propensity to consume the enough to represent a 1 ½ years increase in the length of expected life[6]. Although the Euro Area

[6] As with the UK we assume that θ and ρ are approximately the same size.

is open, it is not small, and an increase in saving on this scale would affect world real interest rates noticeably. Figure 6 plots real long term interest rates in the Euro Area, the UK and the US in each of out three scenarios. Rates go up by a similar amount everywhere in the increased working life scenario, as we would expect, and they go down by similar amounts in the increased saving scenario.

Figure 8 The effect of scenarios on the Euro Area current balance

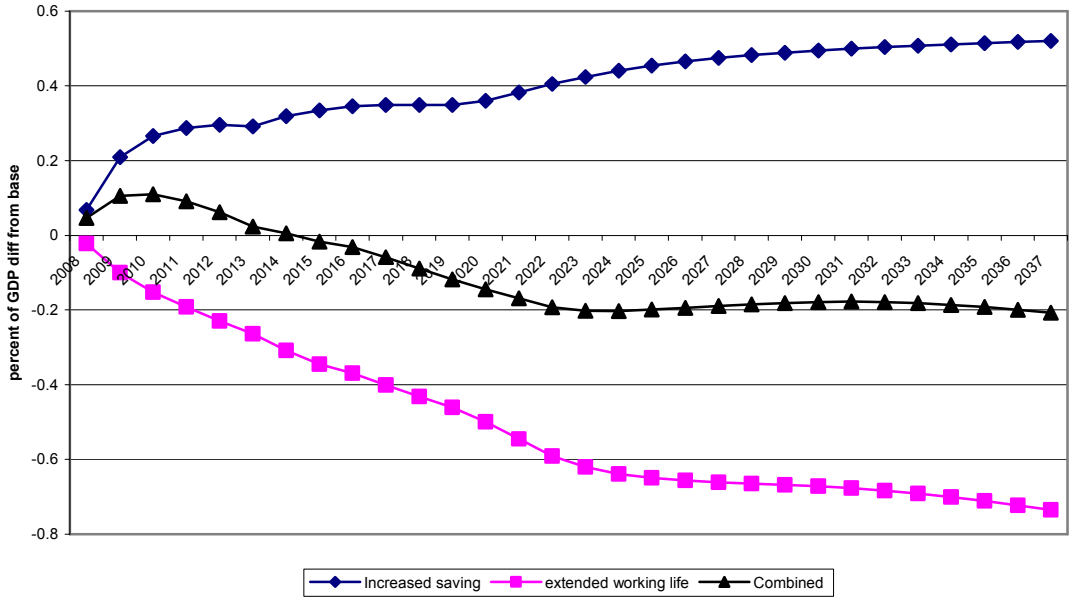
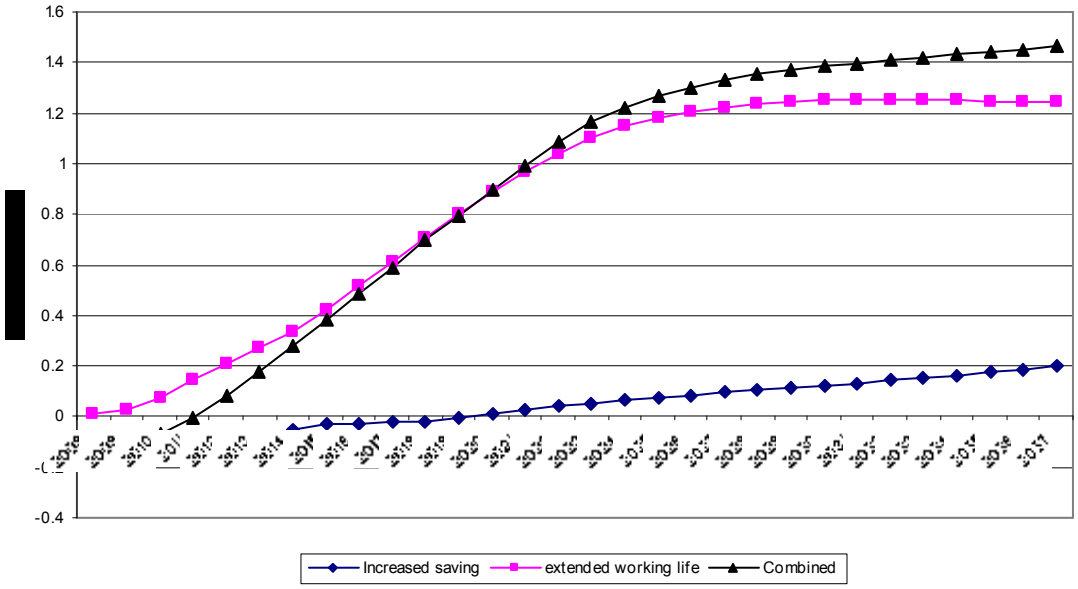


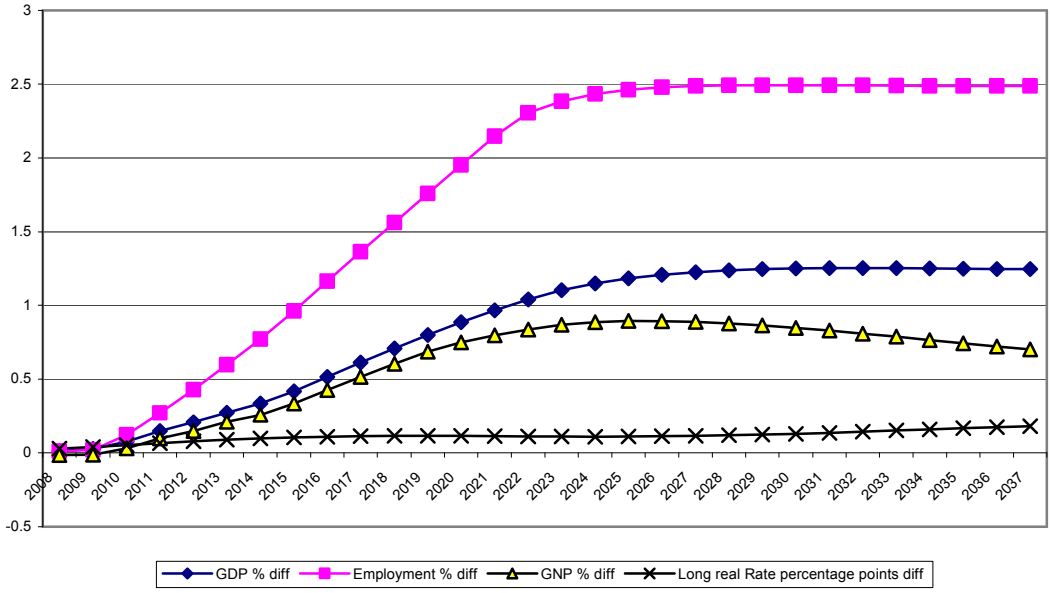
Figure 7 plots the impacts of the three scenarios on the Euro Area current balance as a percent of GDP, an this gauges the scale of the effect on world saving. As we have set up the saving scenario and the work scenario to represent and increase in expected life that matches the increase in working life leaving the ratio of retirement to total adult life unchanged, it is not surprising that the overall effect on the current account and on real interest rates is small in the combined scenario. Figure 8 plots the output effects.

Figure 9 The effect of scenarios on Euro Area GDP



The major focus of this paper is the impact of extending working lives on the Euro Area countries, and figure 9 reports on the overall effects of increasing employment by one year, or around 2 ½ percent with those extra person working an average or 2/3rds of normal hours. As a result output rises by about 1 ¼ percent which is less than the labour input increase. As in the UK, this is in part because the government capital stock does not rise as quickly as the private sector capital stock. We assume that the Stability and Growth Pact would leave no room for significant increases in infrastructure investment, and hence government investment rises with capacity output.

Figure 10 Extending working lives



The saving rate in the Euro Area falls ahead of the increase in labour income, and it is permanently lower as savings needs are less, much as in the UK. Forward looking consumer can see that their incomes will be higher in future, and hence they consume some of the gain now. They also know they will be retired for a shorter period. Their behaviour will depend both on the income stream, on the real interest rate they use in discounting their future real incomes, and the real 'myopia' premium they add on to this discount factor. The more financially constrained are consumers, the larger this additional factor. The change in the Euro Area current balance of around 0.8 percent of GDP plotted in figure 8 indicates the potential scale of the decline in national saving, although it is perhaps an overestimate of the effects on consumers. The current account will also deteriorate to the extent that increased capital spending is financed from abroad.

In addition the increase in the demand for capital and the decline in saving in the Euro Area mean that global saving and investment have changed, and as we can see in Figure 7 global real interest rates rise by around 0.15 percentage points. As a result the user cost of capital increases by about 1 ½ percent in the Euro Area. The user cost is the weighted average of bank borrowing costs, which are the long real rate plus the mark up of private sector bonds over government bonds plus the cost of equity finance. The impact of the rise in long rates depends in part on these weights which

vary across countries. The effects also differ from country to country depending on corporate tax rates. Hence the equilibrium capital stock falls by around ¾ of a percentage point, as the average elasticity of substitution is estimated to be about one half in the Euro Area. This in turn reduces capacity output by about a quarter of a percentage point, explaining most of the difference between the increase in labour input and in output in the Euro Area.

In each country we have details on the effects on labour input and output, and these are detailed in Figures 11 and 12. By construction the increases in labour input are similar across countries in the long run but in the short run depend on how quickly labour markets adjust to increased labour input. The more forward looking the wage bargain, the faster the increase in the supply of labour is absorbed. The effects on output vary more across countries, especially in the short run, where the dynamics of the trade equations will also have an impact. In the long run the effects depend mainly on the parameters of the production function (and the impact on the user cost which feeds into the production function) They vary a little across countries and they are least in Spain where we estimate the elasticity of substitution to be around 0.8 as compared to the Euro Area average of around 0.5.

The effects on public finances depends on the impacts on government spending. Direct tax rates are set to meet the targets embedded in the SGP, and if spending were to fall as a percent on FDP then tax rates could fall. We assume that government consumption and investment rise in line with capacity output, and hence there can be no major saving there, and if they were the only type of spending, tax receipts would rise in line with capacity as well. However, we also have government interest payments, which must rise a little as real rates have risen, and transfers to individuals. These will be affected by the policies we are analysing because they have the effect of reducing the number of those receiving state pensions.

The effects on tax rates will depend in the long run on the generosity of the state in this area. The impacts on tax rates are plotted in Figure 13, and the effects are least in the less generous countries such as Greece and Italy, but also n Germany. The short run effects depend on the relative generosity of state aid to the unemployed as the majority of the flow onto the labour force from pensioners are initially unemployed, but get work within a year. The speed of absorption of the retained workers depends on the flexibility of the labour market, and increases in such flexibility will increase the speed of adjustment

The effects on personal sector savings rates also differ between countries as we can see from Figure 14. They depend in part the sources of income of the country, as labour incomes have risen, but other incomes may have fallen as more assets are owned by foreigners. The average is to reduce personal sector savings rations by 0.7 percentage points

Other policies would also have differing effects across the Euro Area, but some of the difference between countries would be absorbed if policies to raise saving were introduced to offset the effects of the Euro Area on world real interest rates. Much but not all of the diversity in impacts comes from this source.

Figure 11 Output effects in the Euro Area

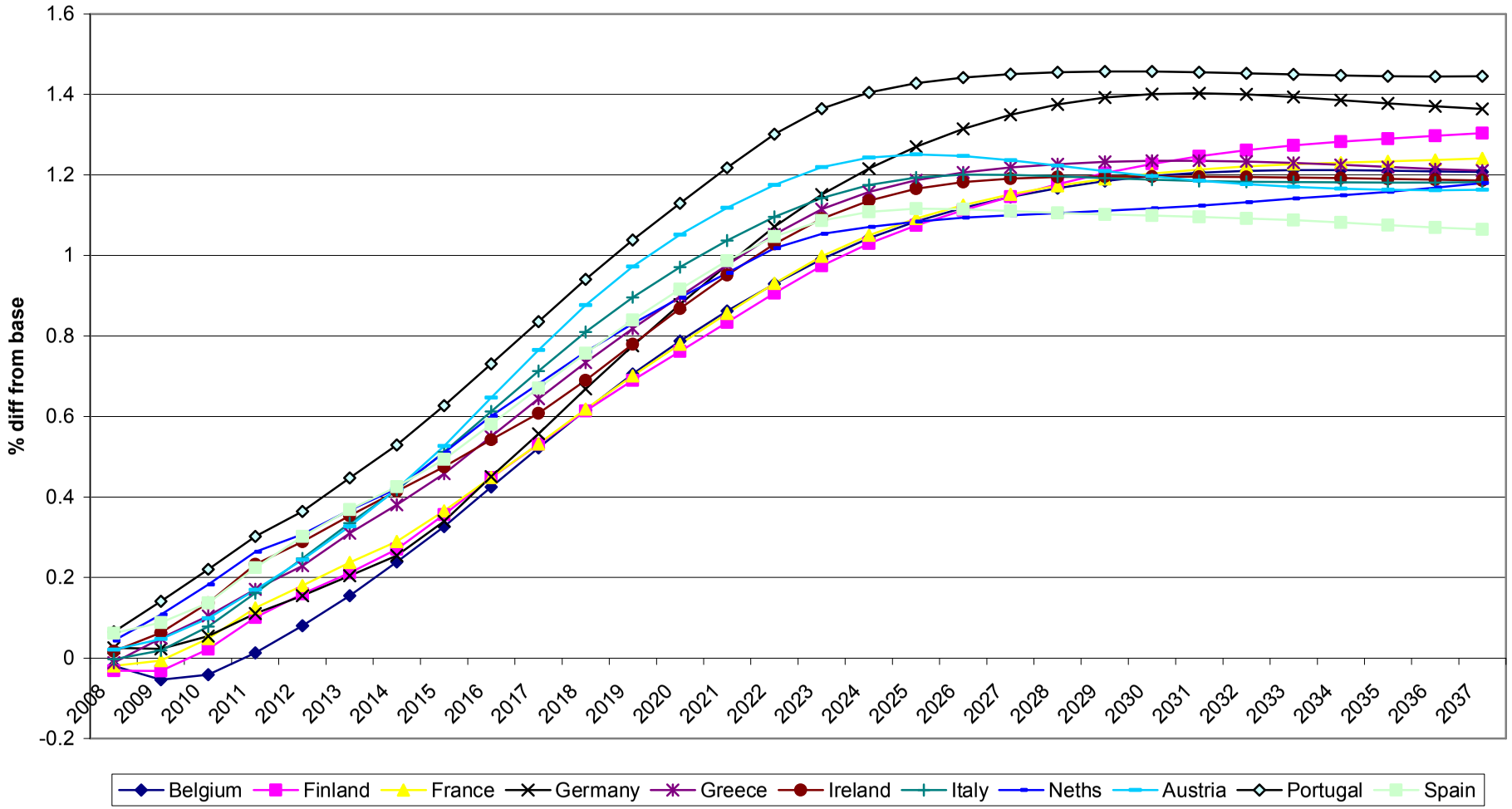


Figure 12 Labour input in the Euro Area

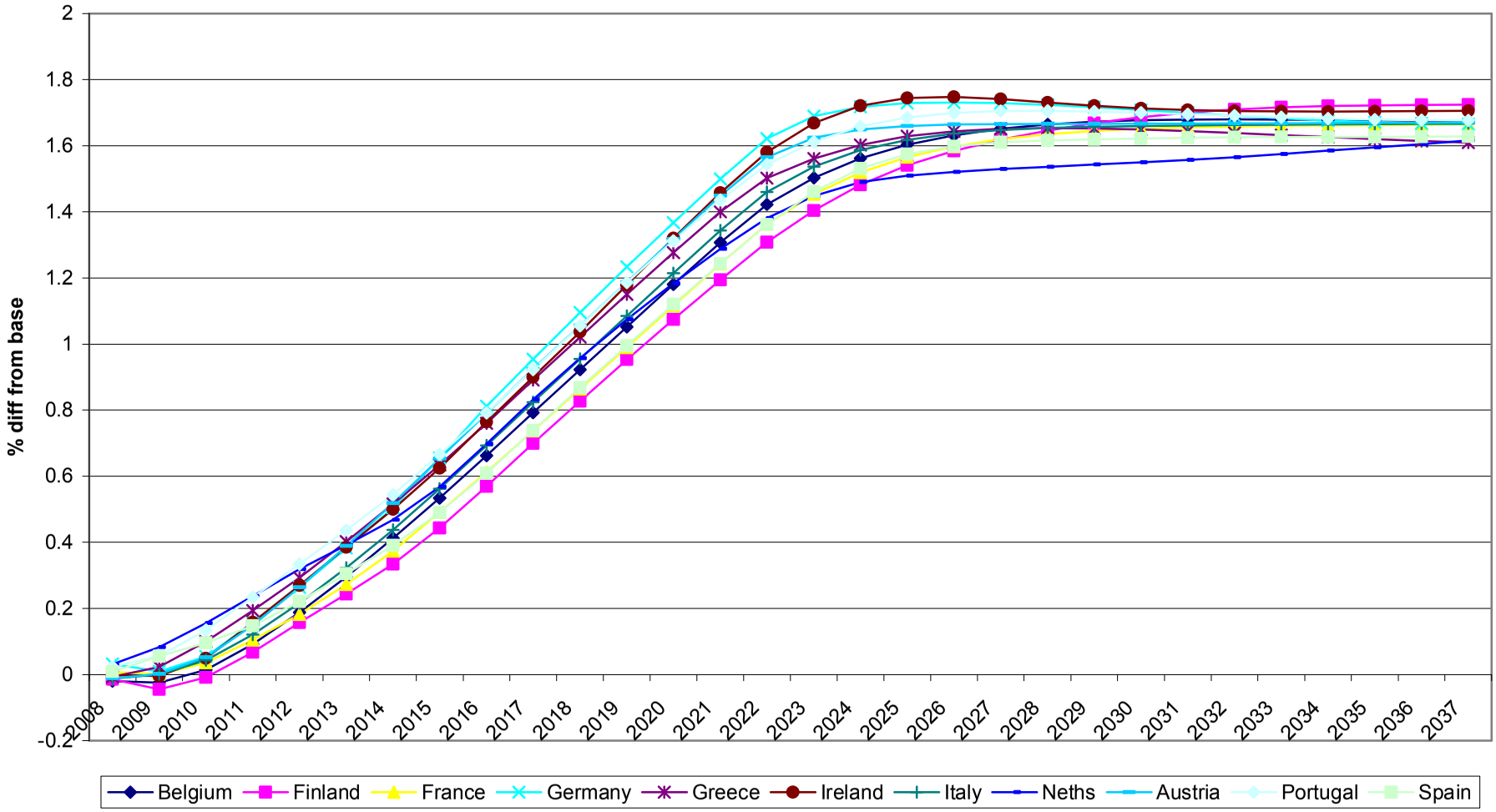


Figure 13 Impacts on direct tax rates

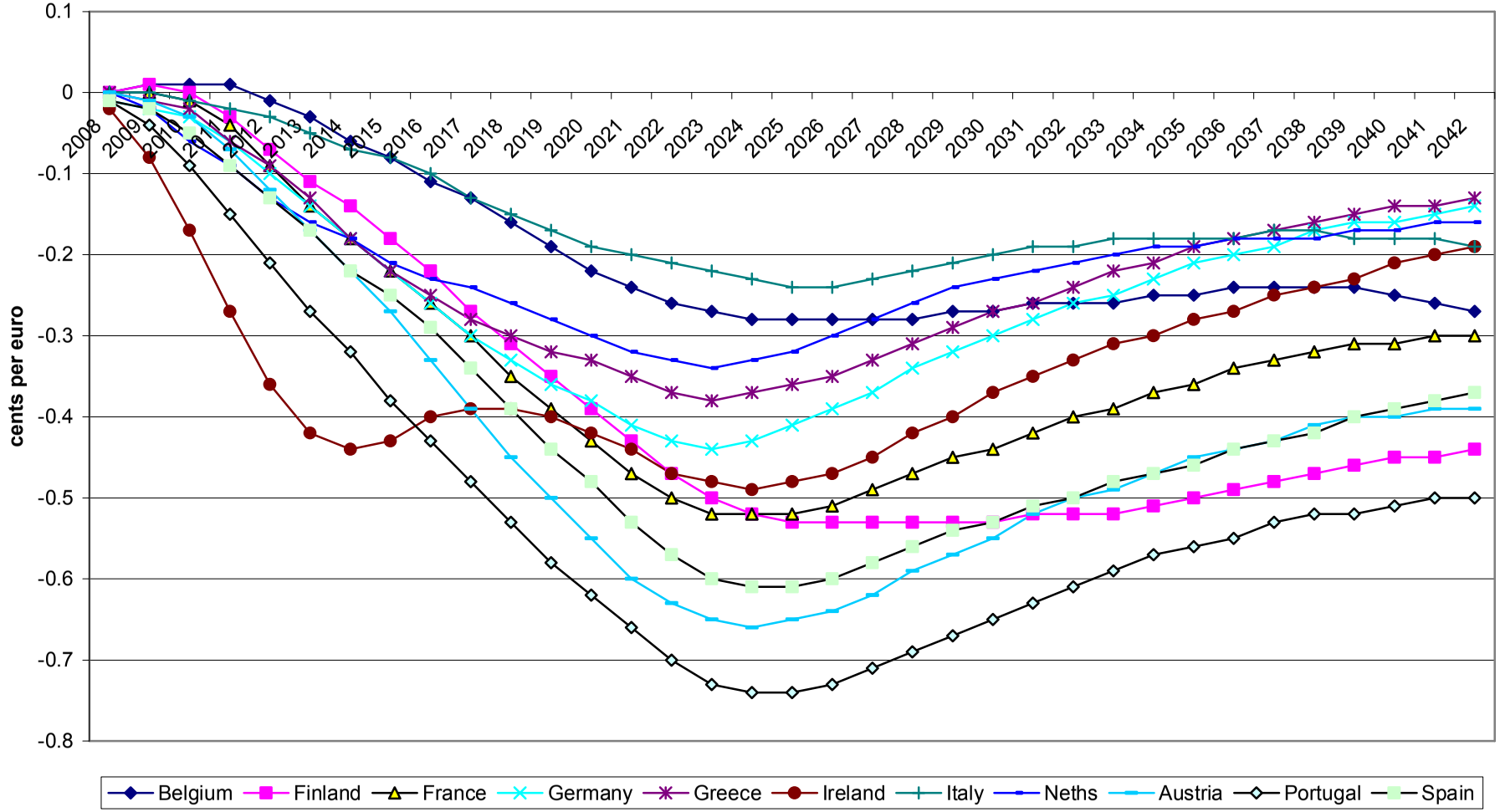
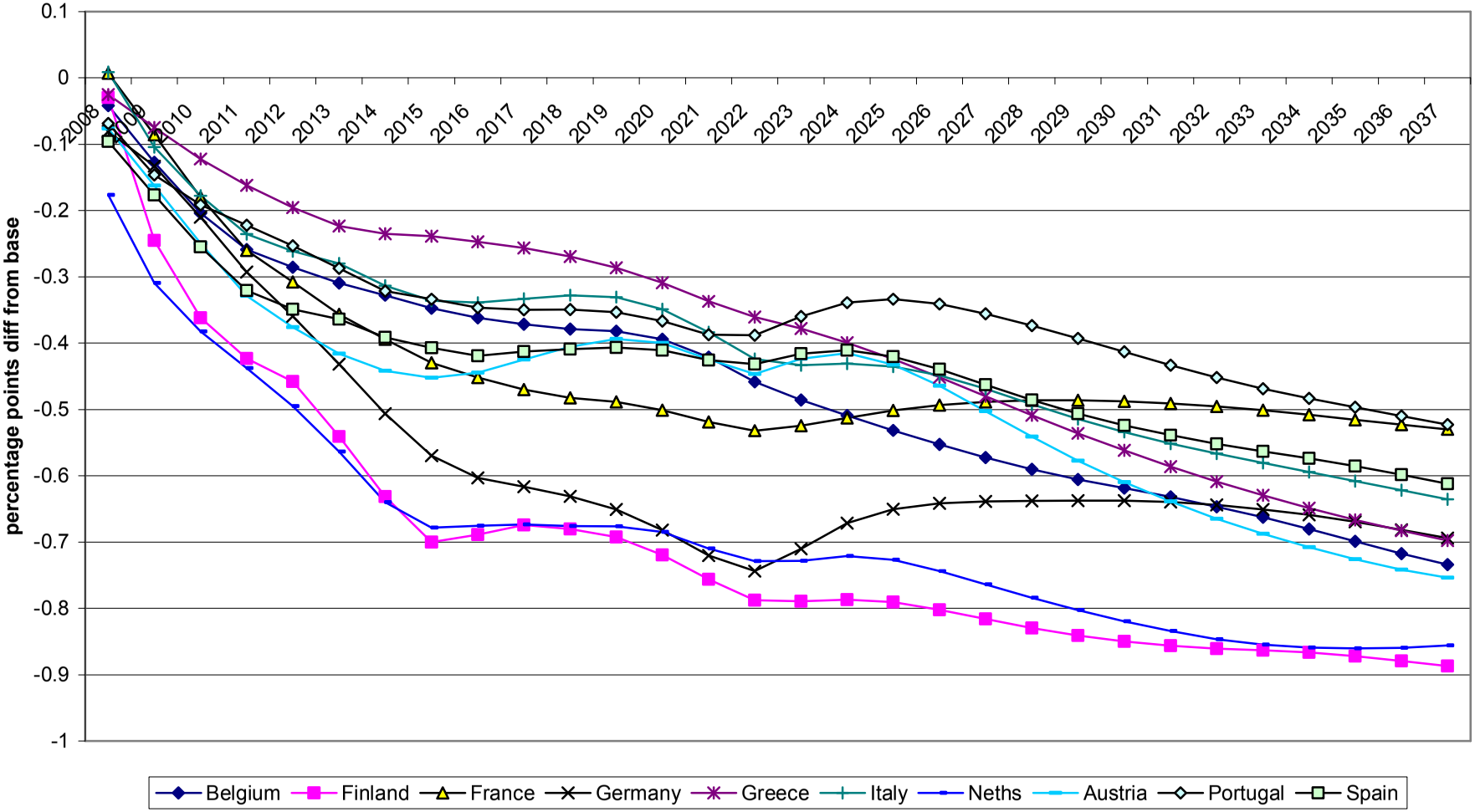


Figure 14 The impact of extending working lives on saving ratios



Conclusion

It is widely acknowledged that the US has a shortfall of savings and as a result has a shortfall on the resources available to cove retirement incomes. Two sets of policies are available. Raising saving raises wealth and GNP with little effect on GDP. Extending working lives reduces saving as it reduces the need for assets to cover a shorter retirement. There are at least two ways to increase saving. Compulsory savings and voluntary schemes based on greater returns to saving may have an impact on overall savings but they may face significant substitution out of other forms of saving (or out of working lives) unless people are persuaded of the need to save. Increasing perceptions of expected life to bring them into line with life expectancy should raise overall savings substantially. Increasing working lives can be driven either by a statutory increase in the age at which state retirement pension is available, or by changes in the perception of expected life. It is indeed possible that increasing the state retirement age would change perceptions of expected life more effectively than any other policy. We have analysed a policy bundle that raises saving and increases working life. It is easy to do this in a fully forward looking model of the economy. It is perhaps a little harder to do it in reality, but progress is being made.

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