

Is Immigration the Answer to the UK's Pension Crisis?

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Abstract: As a result of population ageing and declining fertility, the UK state pension system is unlikely to remain viable without a steady inflow of young immigrant workers from abroad. Using plausible assumptions we show that up to 500,000 immigrant workers pa. will be needed to save the state pension system. Other things equal, a positive annual net inflow of immigrant workers is required whenever:

- the real growth rate in pensions exceeds 2.5% pa.
- the number of retirees exceeds 660,000 pa.
- the number of deaths falls below 570,000 pa.
- the real growth rate in wages is below 1.5% pa
- the number of births is below 590,000 pa.

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Introduction

In 1990, there was one pensioner in the UK for every four workers. By 2030, there is projected to be nearly two pensioners for every five workers¹. Furthermore, the average birth rate per female in the UK is below two. These two trends indicate that, if there are no other changes, the indigenous population of the UK is ageing and will eventually decline. Each subsequent generation will be smaller than the previous one and this makes it much harder to sustain a pay-as-you-go state pension system without an excessive burden being placed on each future young generation.

Ceteris paribus, the supply of labour will fall relative to capital which, in turn, will raise wages relative to interest rates (the return on capital). This will encourage a substitution away from labour towards capital in the production process. The resulting capital creation (i.e., investment financed by borrowing or equity issuance) will increase capital per worker and hence increase labour productivity. The effect on total output and national income depends on whether the growth rate in productivity exceeds the rate of decline in population. Unless it does, a pay-as-you-go state pension system would still not be viable.

What would alter the calculation, however, would be population migration. We live in a rapidly globalising economy with increasing capital and labour mobility². The UK and also the rest of Europe are clearly very attractive places for people located outside Europe to work in³, so immigration would be one key way of changing the worker-pensioner balance as well helping to attenuate the growth rate in wages that would otherwise be induced by labour shortages. Population migration (whether planned or unplanned) is likely to have a dominating influence on the future demographics of the UK, since immigrant populations also tend to have very high birth

¹United Nations, *World Population, 1950-2050 (2000 Annual Revision)*. New York: UN Population Division, 2000.

² The International Organisation for Migration notes that migration flows are ‘amongst the most reliable indicators of the intensity of globalisation’. At the beginning of the 21st century, 175m people or 2.9% of the world’s population were classified as international migrants (*World Migration 2003: Managing Migration – Challenges and Responses to People on the Move*, Geneva: International Organisation for Migration, 2003). Proportionately though migration flows were much larger in the 19th century when 10% of the world’s population migrated, mainly to the New World (Timothy J Hatton and Jeffrey G Williamson, *The Age of Mass Migration: Causes and Economic Impact*, New York: Oxford University Press, 1998)

³ ‘During the 1990s, Europe became a continent of immigration’ according to the International Organisation for Migration (2003).

rates. In this article, we calculate the number of immigrants needed to preserve the viability of the UK state pension system⁴.

A simple framework for determining the level of immigration needed to maintain a viable state pension system

Suppose the government's objective is to stabilise the pension bill to wage bill ratio at some desired level, say K. This is equivalent to active workers facing a stable average tax rate over time of K% of earnings in order to pay the pensions of retired workers. That is:

$$\frac{\text{Pension bill at } t}{\text{Wage bill at } t} = K$$

where

Pension bill at $t = \text{Average pension at } t \times \text{Number of pensioners at } t$

$$= [P_0 \times (1+p)^t] \times [N_0 \times (1+n1)^t \div (1+d)^t]$$

Wage bill at $t = \text{Average wage at } t \times \text{Number of employed workers at } t$

$$= [W_0 \times (1+w)^t] \times [L_0 \times PR_0 \times (1+pr)^t \times (1+b)^t \times (1+i)^t \div (1+n2)^t]$$

P_0 = current average pension

p = annual real growth rate in the pension

N_0 = current number of pensioners

$n1$ = annual growth rate in pensioners (as a percentage of pensioners)

$n2$ = annual exit rate from work due to retirement (as a percentage of the labour force)

d = annual death rate in pensioners (as a percentage of pensioners)

W_0 = current average wage

w = annual real growth rate in average wages

L_0 = current labour force

PR_t = participation rate of the labour force at t

pr = annual growth rate in the participation rate (as a percentage of the labour force)

b = annual entry rate into the labour force (assumed to be the same as the domestic birth rate, as a percentage of the labour force)

i = annual rate of immigration (as a percentage of the labour force)

⁴ Immigration can also be used to sustain a country's fiscal policy, see, e.g., Kjetil Storesletten 'Sustaining fiscal policy through immigration' *Journal of Political Economy*, 108 (2000), 300-323.

This requires the annual growth rate in the wage bill to equal the annual growth rate in the pension bill:

$$p + n_1 - d = w + pr + b + i - n_2$$

The required annual rate of immigration is therefore:

$$i = p + n_1 + n_2 - d - w - pr - b$$

This rate can be estimated using data for the UK for the period 2001/2002:

$Po = £7,790$ (*Simplicity, Security & Choice*, DWP Green Paper 2002, Fig 6.3)

$No = 11.1m$ (*Annual Abstract of Statistics 2003*, Table 10.15)

$Wo = £23,400$ (*Annual Abstract of Statistics 2003*, Tables 7.25 and 7.1)

$Lo = 27.7m$ (*Economic Trends*, December 2002, Table 4.3)

$PRo = 63\%$ (*Economic Trends*, December 2002, Table 4.3)

$p = 2\%$ (assumption)

$w = 2\%$ (assumption)

$pr = 0\%$ (assumption)

$b = 2.6\%$ (= births (730,000)/ labour force) (*Annual Abstract of Statistics 2003*, Table 5.2)

$d = 5.6\%$ (= deaths (632,000)/ pensioners) (*Annual Abstract of Statistics 2003*, Table 5.2)

$n_1 = 5.6\%$ (= retirements (620,000)/ pensioners) (*Pensions Pocket Book 2003*, p5)

$n_2 = 2.2\%$ (= retirements (620,000)/ labour force) (*Pensions Pocket Book 2003*, p5)

Hence $K = £86bn/£648bn = 13\%$ and $i = 2 + 5.6 + 2.2 - 5.7 - 2 - 0 - 2.6 = -0.5\% (-140,000)$.

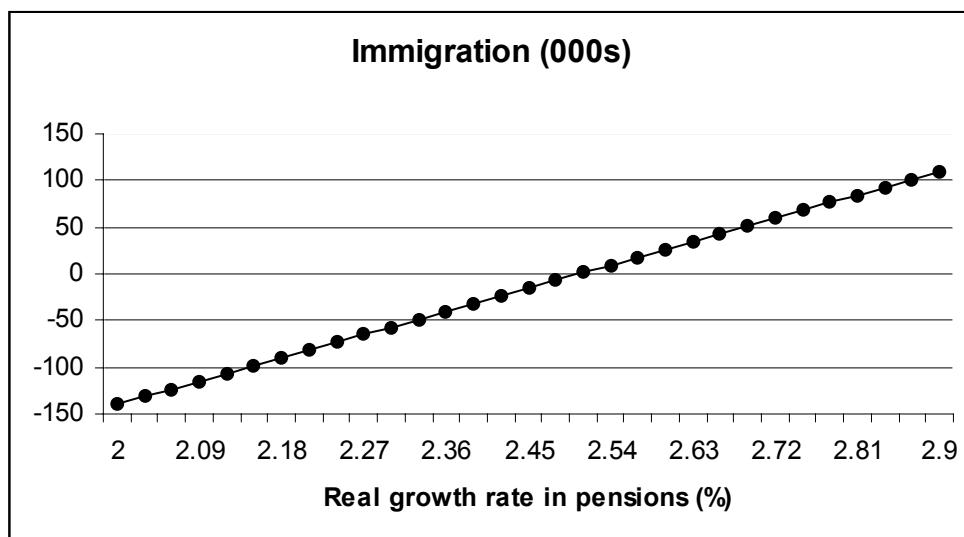
Under current conditions, therefore, the state pension system would remain viable even if 140,000 active workers per year emigrated from the UK.

However, the annual number of births has fallen from 960,000 pa in the 1960s to 730,000 in the 1990s, a fall of 24% in four decades. Suppose this trend continues and b falls to 2%. Suppose the increased ageing of the population leads to d falling to 5.4%. And suppose as the baby boomers begin to retire (at the rate of 800,000 pa), n_1 rises to 7.2% and n_2 rises to 2.9%. Then $i = 2 + 7.2 + 2.9 - 5.4 - 2 - 0 - 2.9 = 1.8\% (+500,000)$. Under these circumstances it would take 500,000 immigrant workers per year to keep K at 13% and hence preserve the viability of the state

pension system. This would be a fairly large number of new workers to absorb every year, particularly if they had families as well⁵.

There are, of course, a number of alternative solutions. For example, there would be no need for any net immigration if the real growth rate in pensions were reduced to zero ($p=0$).⁶ A large increase in the participation rate would also help, as could an increase in productivity (which requires an increase in capital per worker, and hence an increase in investment per worker). The sensitivity of the required number of immigrants to changes in the above assumptions is shown in the following set of graphs.

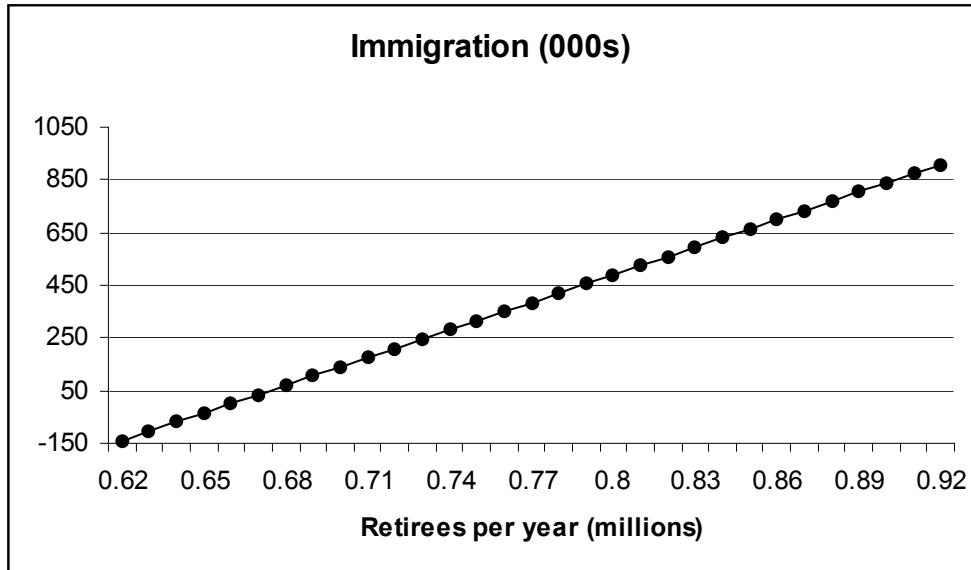
This graph shows how the required annual level of migration varies (positively) with the real growth rate in pensions. The level is positive when the real growth rate in pensions exceeds 2.5% pa.



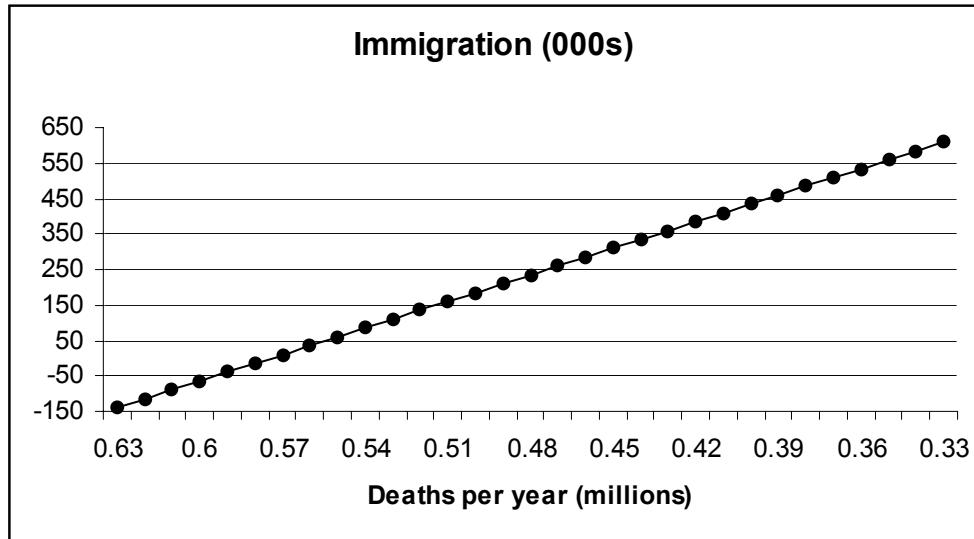
This graph shows how the annual required level of migration varies (positively) with the number of retirees per year. The level is positive when the number of retirees exceeds 660,000 pa.

⁵ The current level of migration into the UK is below 200,000 pa. The average annual net migration of workers (those granted work permits or exemptions under EU rules) into the UK between 1995 and 2000 was 83,000, the difference between an average annual gross immigration of 309,000 and an average annual gross emigration of 226,000 (*Annual Abstract of Statistics 2003*, Table 5.8). However, there were also 92,000 asylum seekers in 2001, the largest figure for any country in the world for that year (*Trends in International Migration*, Paris: OECD, 2003, and UN High Commission for Refugees).

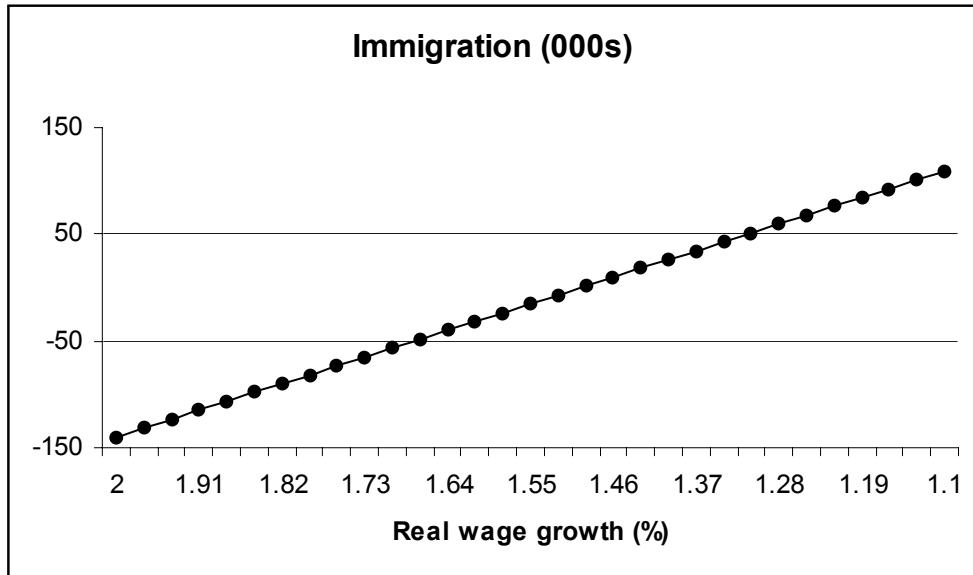
⁶ The current government in the UK has explicitly ruled out cuts in the growth rate of pensions. On the contrary, as a result of the Minimum Income Guarantee and Pension Credit, increasing numbers of pensioners will see their pensions increasing in line with national average earnings. This assumption has been built into the above calculations.



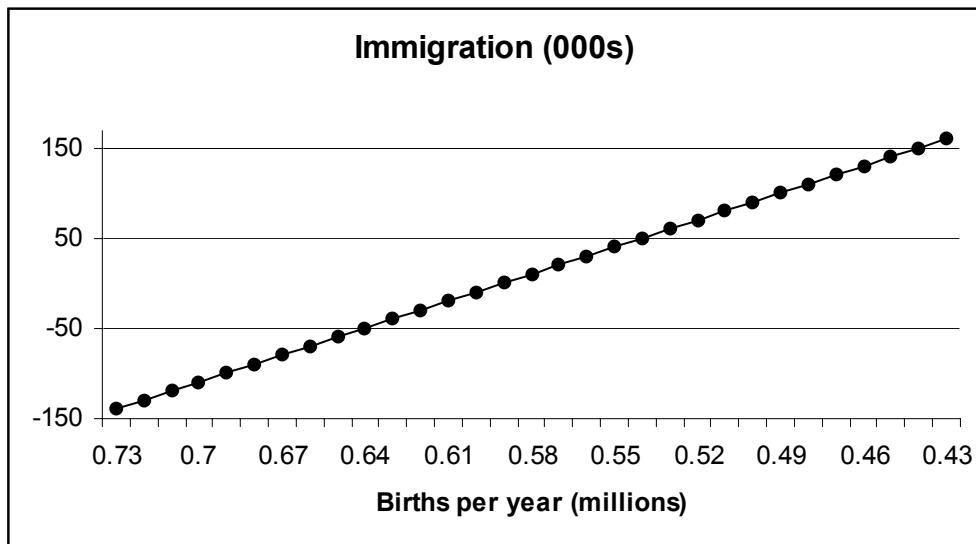
This graph shows how the annual required level of migration varies (negatively) with the number of deaths per year. The level is positive when the number of deaths is below 570,000 pa.



This graph shows how the annual required level of migration varies (negatively) with the real growth rate in wages. The level is positive when the real growth rate in wages is below 1.5% pa.



This graph shows how the annual required level of migration varies (negatively) with the number of births per year. The level is positive when the number of births is below 590,000 pa.



There are other factors that need to be taken into account in this analysis:

- A key assumption underlying the above calculation is that the immigration is demand-led and brings in qualified immigrants with needed skills⁷. This is the policy followed by countries such as Australia and the US and is one that has been successful in maintaining

⁷ George J Borjas, ‘The economic benefits of immigration’, *Journal of Economic Perspectives*, 9 (1995), 3-22.

a high degree of social cohesion in a way that an influx of low-skilled immigrants who would be competing in the labour market with the incumbent workforce might not be⁸.

- The rapidly changing nature of the global economy also needs to be taken into account. Even key services can now be provided internationally, eg Prudential and British Telecom have set up call centres in India. So, with the spread of information technology, the ‘immigrant workers’ do not necessarily need to move from home. We should not forget the failed attempt to save the UK textile industry in the 1970s by bringing in low-wage immigrants to the northern industrial cities.
- The impact of immigration on domestic wages also needs to be taken into account. Estimates from the US⁹ suggest that ‘an immigrant influx that increases the supply of workers in a particular schooling-experience group by 10% lowers the wages of natives in that group by 3 to 4 % and reduces weeks worked by 2 to 3 %’ .
- Increasing levels of immigration are supply-led and such immigrants might not have the requisite skills. The UK is now one of the most densely populated countries in the world which makes it more difficult to absorb large numbers of immigrants, with major implications for housing, transport and public services.

Conclusion

An ageing society which is also declining because its birth rate is too low faces stark choices if it is going to have a credible and viable pension policy. Credible pension policies have to be time consistent, and time consistent policies cannot pass the buck to future generations (i.e., they have to exhibit intergenerational fairness). This implies that the ratio of the pension bill to the wage bill cannot rise systematically. If the next generation is smaller in number than the current generation, the current generation has to:

- accept a cut in its pension or
- save more whilst in work or
- work longer and retire later or
- accept more immigration.

⁸ Michael Ben-Gad, ‘Importing human capital: Immigration in the endogenous growth model’, Department of Economics Working Paper No. 3, Central European University, Budapest, 2003.

⁹ George J Borjas, ‘The labor demand curve is downward sloping: Re-examining the impact of immigration on the labor market’ Harvard University, November 2002

Using plausible assumptions we have shown that up to 500,000 immigrant workers pa. will be needed to save the state pension system in the UK. Other things equal, a positive annual net inflow of immigrant workers is required whenever:

- the real growth rate in pensions exceeds 2.5% pa.
- the number of retirees exceeds 660,000 pa.
- the number of deaths falls below 570,000 pa.
- the real growth rate in wages is below 1.5% pa
- the number of births is below 590,000 pa.

It is highly likely that the demographics will dominate the economics over next 50 years in the UK, since increases in labour productivity by themselves will not be sufficient to compensate for the combined problems of population ageing and declining fertility. It is therefore also highly likely that pensions and immigration issues will increasingly dominate the political agenda on national resource allocation over next half century.