National Institute of Economic and Social Research

THE IMPACT OF POSSIBLE MIGRATION SCENARIOS AFTER 'BREXIT' ON THE STATE PENSION SYSTEM

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1. Introduction and summary

Commissioned by the Institute and Faculty of Actuaries (IFoA), the purpose of this paper is to explore the impacts of changes in migration flows – in particular, those resulting from possible migration policy changes after a UK exit ('Brexit') from the European Union (EU) – on the finances of the UK state pension system.

Migration is one of the central issues in the EU referendum debate. At NIESR we have carried out extensive research and analysis on migration and the impact of migration on the economy.[1] One aspect which has not been considered to date is the extent to which migrants contribute to, and draw on, the state pension system. To our knowledge, this is the first research paper to quantify the possible impact of alternative migration scenarios on the pension system. To carry out this research we require some plausible alternative migration scenarios and a simulation model which differentiates the characteristics of EU and non-EU migrants and indigenous or native residents. We have presented three possible migration scenarios based on the volume of migrant flows, and a further three scenarios by assuming that the earnings of new migrants are significantly higher to simulate an 'Australian-style' points system.

Our main conclusions are that **reductions in immigration would have a negative impact on the public finances. To offset these impacts policy change in the form of increases in national insurance contributions, reductions in pensioner benefits, or increases in the state pension age could be used. More restrictive immigration policies would, not surprisingly, have more negative impacts. However, these impacts could be mitigated, and indeed reversed, were the government to be able to successfully implement a very significant change in the incomes (and implicitly the skills or qualifications) of new migrants by introducing a skills or points based migration policy (perhaps similar to the policy in Australia). The reduction in EU migrants, an increase in total non EU migrants and an up-scaling of skills are all possible policies which have been aired in the referendum debate. However, an important policy question, which we do not address here, is whether these policies would and could actually be delivered in practice.**

To carry out this analysis we use NIESR's Lifetime Income Distributional Analysis model (LINDA), originally developed by NIESR for HM Treasury, Revenue and Customs, and the Department of Work and Pensions. A full description and technical details can be found in van de Ven (2016) and a short non-technical summary is contained in Annex 1.2. We use this micro-simulation model to show the impact of each migration scenario on key elements of government spending and tax revenue and the overall budgetary impact. We then consider alternative policy options to address these budgetary impacts and, importantly, allow individuals in our model to adjust their behaviour in terms of how much they save and how much they work, accordingly. This ensures that behavioural responses are fully taken into account in our estimations. Note that much of the public debate thus far has only focussed on one side – either the additional expenditure, due to claimed in-work benefits, or the additional income, due to higher taxes paid. In this study we bring them together to show the overall

[1] http://www.niesr.ac.uk/eu-referendum-niesr-research

[2] http://www.niesr.ac.uk/publications/linda-dynamic-microsimulation-model-analysing-policy-effects-evolving-population-cross#.VznOhPkrKM8

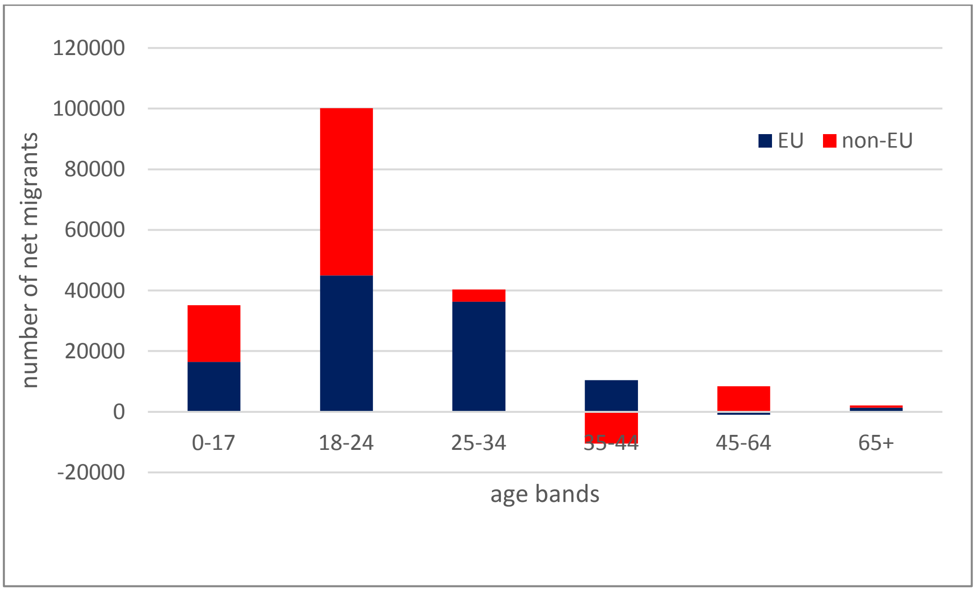
budgetary impact of the migration scenarios and assumptions about changes in future migrants' income.

We add two caveats to these findings. First, while the impact of alternative migration scenarios on tax revenue and expenditure are large and statistically significant, the net effect on the government budget – although substantive – is not statistically significant. This underscores the importance of uncertainty associated with the projected effects. Second, the increase in total state retirement benefits over the time period considered, without any change in migration policy, of around £94b dwarfs the higher costs due to any changes in migration scenarios we consider. From this perspective, the substantive issues are about domestic policy.

2. Migration scenarios

In order to model the impact of migration in LINDA, we need to know the number and characteristics of immigrants and emigrants, differentiating between EU and non-EU migrants. As our base case, we take the 2014-based Principal Population Projections for the UK produced by the Office for National Statistics (ONS), and the migration assumptions contained therein. These are the official migration statistics and projections and we believe therefore they are an appropriate place to start. The official projections show net migration falling to 185,000 from 2020-21, and remaining constant at that level in subsequent years. The ONS projects both immigration and emigration by age. We combine this with the ONS International Passenger Survey which shows the break-down between EU and non-EU migrants to project the base net migration scenario for 2020/21 shown in figure 1 below.

Figure 1: Base simulation scenario net migration from 2020/21



Sources: Office of National Statistics, 2015 and authors' calculations.

However, the ONS Population Projections data does not provide any further details on the characteristics of the projected new migrants. We use data on recent UK immigration and emigration to disaggregate between EU and non-EU migrants; and we use data from the Family Resources Survey to estimate the income distribution of new migrants, and hence their labour market characteristics and outcomes. A summary of recent immigrants by age and income quintile distribution is presented in table 1 below. For example, of the 25 to 34 year old immigrants, 51.8% are in the lowest 40% of the overall UK gross income distribution.

Table 1: Distribution of recent immigrants to the UK relative to the gross equivalised benefit unit incomes of the wider UK population

age	sample	gross equivalised income quintile				
band	size	lowest	2	3	4	Highest
18-24	483	0.232	0.222	0.162	0.172	0.205
25-34	1,127	0.270	0.248	0.186	0.158	0.137
35-44	476	0.291	0.278	0.143	0.118	0.162
45-64	241	0.277	0.246	0.200	0.111	0.165
65+	31	0.627	0.130	0.071	0.056	0.115

Source: Authors' calculations on Family Resources Survey data pooled over 2010/11 to 2012/13 cross-sections
Notes: Total gross income is reported in the Survey by the variable code = buinc
Income equivalised using the OECD revised scale
Income quintiles evaluated by age and year based on population omitting recent immigrants
Recent immigrants defined as benefit units in which all adult members reported as moving to the UK and where the most recent immigrant arrived within the 5 years preceding the month of their inclusion in the Survey.

2.1 Migration flow scenarios

We construct six alternative scenarios to assess the impact of changes to migration policy after a possible Brexit outcome. These scenarios are implemented in our modelling from 2017 onwards. The first three scenarios listed below – 1A, 2A and 3A – each differ by the number or flow of migrants, but we importantly assume that the incomes of new migrants remain unchanged from the base case based on the official projections. In each scenario we assume that emigration flows of UK natives out of the UK remains unchanged. The overall effect of these assumptions is shown in figure 2. The second set of scenarios, introduced in sub-section 2.2 below, allows for assumed differences in earnings of migrants to reflect an illustrative points-based policy, also shown in figure 2.

Base:

Population and migration projections contained in the ONS Populations Projections 2014.

Scenario 1A:

Scenario 1A could be described as a "restrictive" policy. We assume a substantial reduction in EU migration, with no offsetting change in non-EU flows:

- Immigration from the EU declines to 1/3 of base value in all years from 2017
- Immigration from outside the EU remains unchanged
- Emigration of immigrants who were originally from the EU declines linearly from 2018, stabilising at 1/3 of the original projection by 2027
- Emigration of UK natives and immigrants from outside the EU remain unchanged

Scenario 2A

In scenario 2A, we assume – as some proponents of Brexit have proposed – that a reduction in migration from the EU is offset, in part, by an increase in immigration from outside the EU:

- Immigration from the EU declines to 1/3 of base value in all years from 2017

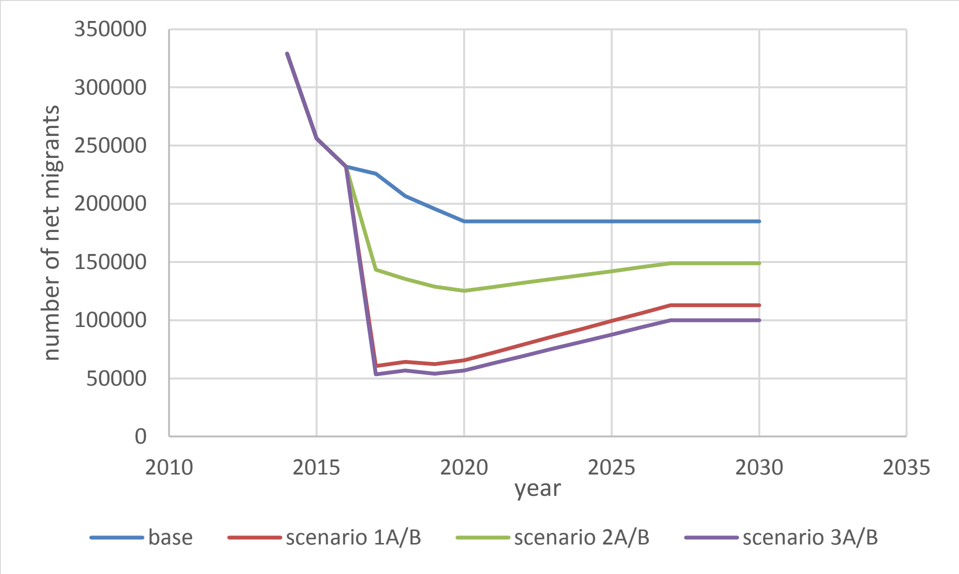
- Immigration from outside the EU increases to offset 50% of the reduction in immigrant numbers from the EU
- Emigration of immigrants who were originally from the EU declines linearly from 2018, stabilising at 1/3 of the original projection by 2027
- Emigration of immigrants who were originally from outside the EU increases linearly from 2018, stabilising in 2027 at a rate proportional to the rise in the number of non-EU immigrants arriving in the UK
- Emigration of UK natives remains unchanged

Scenario 3A

In Scenario 3A, we assume that policy is adjusted to meet the government's target that net migration should be reduced to 100,000 or below. This requires not just reductions in EU migration, but also some additional reductions in non-EU migration.

- Immigration from the EU declines to 1/3 of base value in all years from 2017
- Immigration from outside the EU adjusts from 2017, so that total net migration stabilises from 2027 at 100,000 net new entrants per year.
    - This requires a reduction in non-EU net immigration from 77,000 to 64,000 per year or 17% fall in total over ten years.
- Emigration of immigrants who were originally from the EU declines linearly from 2018, stabilising at 1/3 of the base projection by 2027
- Emigration of immigrants who were originally from outside the EU adjusts from 2018, to stabilise from 2027 at a rate proportional to the change in the number of non-EU (non-UK) immigrants.

Figure 2: Net inward migration flows by year and simulation scenario



2.2 Points-based migration assumptions

As noted above, in scenarios 1A, 2A, and 3A, we assume that that the incomes of new migrants remain unchanged from the base case; we simply vary the flow numbers. However, it is also possible that changes in policy will result in changes to the characteristics of new migrants. In particular, proponents of Brexit have argued that ending the free movement of labour would allow the UK to pursue a more targeted policy of economic migration, often described loosely as an "Australian-style points system".

We vary each of these scenarios by assuming that changes to migration policy mean that new immigrants have a different income distribution to past immigrants. In particular, we assume that policy changes mean that new immigrants to the UK have the same level of income relative to the resident population as currently observed for immigrants to Australia. This implies a considerable increase in the incomes earned by immigrants to the UK over that currently observed; the plausibility of this assumption is discussed below. Apart from immigrants under 25, all other immigrant age groups to Australia have a higher relative income than recent immigrants to the UK (comparing tables 1 and 2) although their incomes on average are still below the income of natives. The distribution of recent immigrants' income to Australia is reported in table 2 below.

Table 2: Distribution of recent immigrants to Australia relative to the gross equivalised benefit unit incomes of the wider Australian population

Age	gross equivalised income quintile				
Band	lowest	2	3	4	highest
18-24	0.272	0.250	0.159	0.160	0.159
25-34	0.231	0.218	0.197	0.198	0.156
35-44	0.177	0.195	0.167	0.223	0.239
45-64	0.203	0.214	0.211	0.189	0.183
65+	0.471	0.132	0.114	0.115	0.168

Source: Authors' calculations on Australian Survey of Income and Housing data, pooled over 2008 and 2010 cross-sections
Notes: Total gross income is reported in the Survey by the variable code = inctscu8
Income equivalised using the OECD revised scale
Income quintiles evaluated by age and year on population omitting recent immigrants
Recent immigrants defined as benefit units in which at least one adult member reported moving to Australia at some time after 1996.

Combining the shift in immigrant incomes with the changes in migrant numbers produces three additional simulation scenarios: 1B, 2B and 3B. The migration flows however remain the same quantum as shown in figure 2.

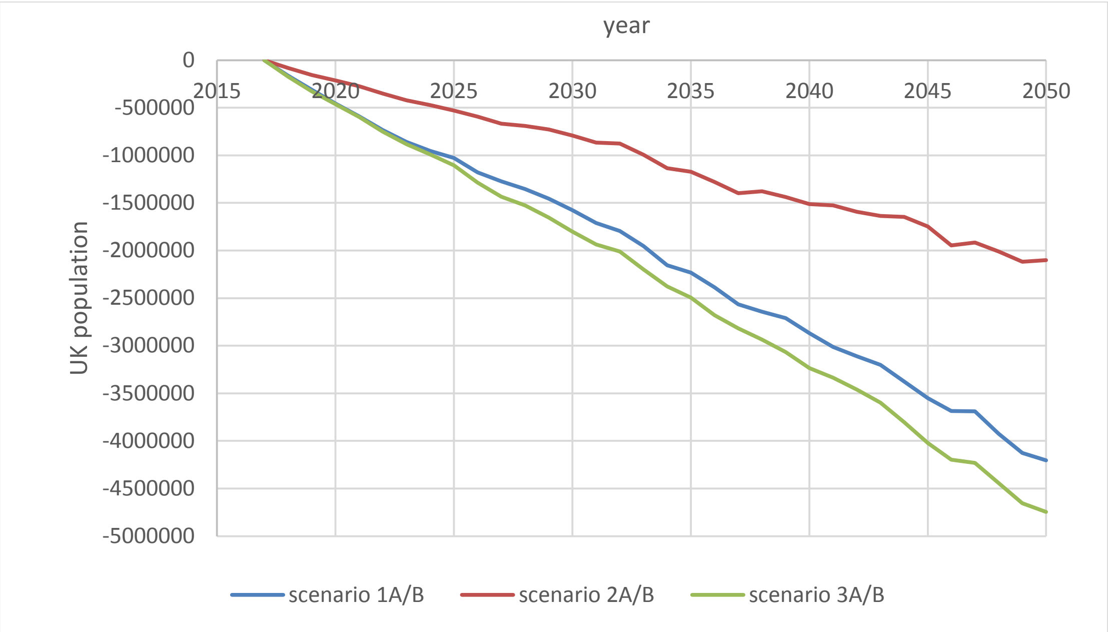
3. Results

3.1 Population

The impact of each simulated scenario, relative to the base scenario, on the UK population is displayed in figure 3.

We see a substantial decline in the UK population relative to the base case of the ONS population projection, driven by two effects. The first of these is the reduction in the number of immigrants living in the UK. Scenario 1A, for example, generates a decline in the immigrant population in the UK of 1.4 million by 2030, and by 2.9 million by 2050. The second effect on the resident population is fewer children born in the UK as a result of the decline in the immigrant population. This second feature reduces the UK population by a larger margin as the time horizon is lengthened: under scenario 1A, it reduces the population by 150,000 by 2030, and by 1.3 million by 2050. By 2050, the largest fall in the UK resident population, relative to the base line, is 4.7 million under scenario 3A, and the smallest fall, of 2.1 million, is under scenario 2A.

Figure 3: Impact of scenarios on UK resident population relative to base case



3.2 Budgetary impacts

As an illustration of the detailed simulation results, we show the impact of scenario 1A on the main taxes and benefits in 2032 (15 years from the beginning of the simulation) and in 2057 (40 years on) in Table 3. The data in the table are the aggregated results of 21 simulations of the model for the single scenario. The table shows the mean and the standard deviation for each item of revenue and expenditure for scenario 1A.

These results shows that the reduction in migration, not surprisingly, causes a reduction both in all (simulated) sources of government revenue, and in benefit expenditure with the exception of expenditure on pensions where the effect is not statistically significant. For example, limiting the flow of immigrants from the EU under scenario 1A results in a decline of working age benefits of around £5.2b and at the same time a fall in VAT receipts of £3.1b in 2032. Most of the impact on benefits comes through reductions in payments of working age benefits, while reductions in tax are felt across all the main taxes (income tax, National Insurance, and VAT). The overall impact is a reduction in net revenues of about £1.8b (0.6% of total tax revenues in the model) in 2032, and of £4.5b (1.2% of total tax revenues) in 2057.

Two additional points arising from Table 3 are of note. First, although scenario 1A results in a substantive reduction in net revenues in 2032 and 2057, the projected reductions are dwarfed by projected increases in total state retirement benefits between 2032 and 2057 even in the base case. In this regard, the £4.5b fall in revenues to 2057 is only 4% of the coincident increase in state retirement benefits of £94b (irrespective of migration scenario) simulated between 2032 (£171b plus £9b) and 2057 (£263b plus £11b) under the base scenario.

Secondly, the standard errors reported in the table indicate that, whereas scenario 1A results in statistically significant reductions in taxes, this is balanced by statistically significant falls in (working aged) benefits, so that the net effect on the government budget – although substantive – is not statistically significant at the 90% confidence interval to 2057, or at the 70% confidence interval to 2032. These results underscore the importance of uncertainty associated with the projected effects of changes in migration. Although the simulation methodology considered here made it impractical to generate standard errors for all results, this important result should be borne in mind when interpreting the remainder of the simulated output. Full results were obtained using a simulation profile that was found to be generally representative of the mean effects displayed for scenario 1A in the table below; associated statistics are reported in Annex 2.

Table 3: Budgetary effects of scenario 1A (£m)

Simulation	Government Expenditure			Government Revenue			Net Revenue
	working aged benefits	from state pension age contributory pensions	from state pension age other benefits	National Insurance	Income tax	Value Added Tax	
				2032			
base	111,480	171,115	8,540	53,397	99,624	127,560	-10,554
	(973)	(999)	(250)	(681)	(1,156)	(460)	(2,618)
scenario 1A	106,305	171,503	8,267	51,788	97,528	124,436	-12,324
	(645)	(932)	(229)	(623)	(1,038)	(404)	(2,020)
effects	-5,175	388	-273	-1,609	-2,096	-3,124	-1,770
	(822)	(237)	(172)	(277)	(621)	(240)	(1,723)
				2057			
base	170,100	262,981	11,072	80,260	138,832	181,083	-43,979
	(2,387)	(1,250)	(299)	(935)	(1,860)	(711)	(3,909)
scenario 1A	153,382	261,472	9,855	74,886	131,634	169,731	-48,457
	(2,471)	(1,284)	(311)	(899)	(1,592)	(661)	(3,613)
effects	-16,718	-1,510	-1,217	-5,373	-7,198	-11,352	-4,478
	(1,678)	(822)	(297)	(595)	(1,745)	(595)	(3,460)

Notes: table reports statistics generated by 21 independent repeated simulations of base and scenario 1A scenarios

Budget figures in £m (2016)

Table reports arithmetic means and standard deviations between simulations; standard deviations in parentheses

The budgetary effects for all simulation scenarios are reported in Table 4 below. Note that the results in the table show the outcome for a single simulation of each scenario. Therefore, the net budget shortfall of Scenario 1A of £3.2b in 2032 in table 4 is a single point estimate. By comparison, the results in table 3 show the mean of 21 simulations. The way to read this is that the simulation result of scenario 1A in table 4 of £3.2b is within one standard deviation (£1.7b) of the mean value reported in table 3 of £1.8b.

In order to focus on the sustainability of the pension system, the table shows the net budget impact of changes to immigration and the necessary adjustments to NIC rates, pensioner benefits, and/or pension age required to offset those impacts. The adjustments are estimated by running a number of simulations about the base policy parameters to find the true value. So, under scenario 1A, offsetting the impacts of the reduction in migration reported for 2032 would require an increase in NICs of 0.8%, a reduction in the value of pensioner benefits of 2.6%, or alternatively an increase of 0.4 years in the state pension age. By contrast, scenario 2B would allow a reduction in NICs of 0.8% to maintain budget neutrality in 2032. However, under this scenario we are increasing both the number of non-EU migrants and with higher earning potential.

Table 4: Simulated budget measures in 2032 and 2057

counterfactual	net budget effect (£m 2016)	NIC (%)	pensioner benefits (%)	pensionable age
		2032		
BASE	-	12	100	67
SCENARIO 1A	-3,203	0.8	-2.6	0.4
SCENARIO 2A	-711	0.2	-0.5	0.1
SCENARIO 3A	-3,926	1.0	-3.1	0.5
SCENARIO 1B	371	-0.1	0.3	0.0
SCENARIO 2B	3,045	-0.8	2.5	-0.4
SCENARIO 3B	281	-0.1	0.2	0.0
		2057		
BASE	-	12	100	68
SCENARIO 1A	-8,057	1.4	-3.6	1.1
SCENARIO 2A	873	-0.1	0.4	0.1
SCENARIO 3A	-7,712	1.4	-3.4	1.0
SCENARIO 1B	7,883	-1.4	3.5	-0.9
SCENARIO 2B	6,859	-1.2	3.0	-0.8
SCENARIO 3B	5,543	-1.0	2.5	-0.7

Notes: NIC: reports projected adjustments to class 1 basic rates required to obtain 0 net budget effect. Pensioner benefits: reports percentage adjustment to Guarantee Credit (applied to all pensioners), Savings Credit, and State Pension required to obtain 0 net budget effect pensionable age: reports change in years to state pension age required to obtain 0 net budget effect

3.3 Discussion

The key conclusions from this analysis emerge immediately from the table above. Reductions in immigration would have a modestly negative impact on the public finances and the sustainability of the pension system, in both the medium and long term. This is seen from scenario 1A in 2032 and 2057 in the table. These impacts could be offset to make a budget neutral policy by an increases in national insurance contributions, reductions in pensioner benefits, or increases in the state pension age. Table 4 shows that assuming that future immigrants have the same skills and earnings as those in the past, the effects on public finances are in the same direction for each of the three scenarios we have assumed. Scenario 2, which has a much smaller reduction in total migration, due to the assumption of an offsetting increase in non-EU migrants, has negligible effect on public finances. The takeaway message is that more restrictive immigration policies would, not surprisingly, have more negative effects on the net government budget.

These budgetary effects of limiting immigration to the UK could be mitigated, and indeed reversed, were the government able to successfully implement a radical change in the incomes (and implicitly the skills or qualifications) of new migrants. For example, if the distribution of migrant income relative to the income of UK natives resembled the distribution in Australia under the so-called 'points system'. These findings are intuitively plausible – migrants, since they are mostly of working age, can be expected to have a positive impact on the public finances, although this impact may attenuate over time as they age. However, the skills mix, and hence incomes, of new migrants is a key driver of their fiscal impact, so a substantial improvement in the skills mix of new migrants can in principle offset the negative impacts of reducing migration.

Some important caveats are in order. First, the analysis here focuses on personal taxes and transfers: that is, we model the most important taxes on income and consumption, and spending on welfare benefits and pensions. Spending on other public services, such as health and education, and other tax revenues, such as taxes on companies and a number of other smaller revenue sources, are excluded from the analysis. However, our results are qualitatively similar to that of other analyses (OBR, 2015; Lisenkova, 2014) which, while incorporating considerably less detail on the individual characteristics of the population, take account of a broader range of taxes and spending programmes.

Second, on the scenarios, these are inevitably stylised. In particular, the assumption in the "B" scenarios that the UK could immediately change the composition of new migrants to match that of Australian migrants is unrealistic. For example, scenario 2B assumes a substantial increase in non-EU immigrants and a substantial increase in their qualifications (proxied by earnings) at the same time. The immigration systems, economies, labour markets, and sources of immigrant flows to Australia are entirely different from those to the UK; in addition, the UK has considerably less control over some migrants flows (for example, refugees) than over economic migrants. In practice, the B scenarios here should be regarded as an upper bound on the improvements to the fiscal position that could be achieved by changing the mix of new migrants.

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ANNEX 1: DYNAMIC MICROSIMULATION MODEL (LINDA)

The Lifetime INcome Distributional Analysis model (LINDA) is a dynamic micro-simulation model that projects the evolving histories of a representative cross-section of the UK population through time. The model is the product of more than a decade of research and development at the National Institute, and is designed to explore the distributional consequences of discrete changes to the economic environment, including changes to tax and benefits policy. Models of this type are very valuable for distinguishing the effects of policy changes on households with specific characteristics. For example at budget time we are used to statements like "A family with two young children will be better off, but a pensioner household worse off".

As in most micro-simulation models, economic behaviour is represented by simple statistical relationships. For example, savings functions may be estimated describing savings as a function of age, income and family circumstances. Labour supply may be treated in the same way, or at best treated as the outcome of a static optimisation.

Macro-economic modellers have been aware of the Lucas critique for many years. The Lucas critique recognises that many decisions – and particularly those concerning the trade-offs between work/leisure and consumption/savings – are sensibly regarded as between today and tomorrow (or intertemporal). It follows that both current saving and labour supply are going to depend on expectations of incomes and relative prices. For example, an increase in state pensions paid to people over 65 should be expected to reduce the saving of people under 65. Or the effects of changes to the tax regime faced by middle-aged savers will depend on the sort of benefit scheme that they expect to find in place when they reach retirement. Statistical estimates of saving or labour supply functions account for these expectations only implicitly, and are therefore ill-suited to adapt to changing expectations in context of policy reform.

The LINDA model adapts to the above observations by projecting family decisions on the assumption that these are the product of dynamic optimisation, given explicit assumptions regarding expectations. The assumption that people engage in some form of optimisation when making their decisions has been a source of criticism for models of the type discussed here. But a powerful riposte to this argument in the field of policy analysis is that it would be odd to implement policies that work as intended only if they are systematically misunderstood. Understanding the incentives embodied by policy counterfactuals is an essential step in good policy design, even if policy-makers ultimately choose to focus upon other issues of concern when selecting between policy alternatives. In short, the fundamental premise underlying use of the modelling framework is that it is a useful way of projecting behavioural responses to incentives embodied by policy counterfactuals; and that this is true even if people do not actually make the optimising calculations that are a central feature of the modelling approach.

A behavioural model can reveal responses to alternative policy counterfactuals in a way that statistical models cannot. How do unemployment benefits affect individual's willingness to work? What are the implications for incentives of changes to the tax relief on savings? Who is likely to respond to changes in pensions means testing? These are the kinds of questions that can only be addressed adequately using a dynamic optimisation model. Furthermore, the intertemporal aspect of the model also permits behavioural responses to be considered over the life course. For example, what effect does encouraging employment early in an individual's life have on their wages when middle aged, and across their entire lifetime?

The analytical approach also makes explicit allowance for individual welfare, which facilitates evaluation of policy alternatives. Many policy proposals, for example, imply different effects at different stages of the life course, and for individuals located at different places in the income / wealth distribution. A revenue neutral increase in retirement benefits, for example, may require a parallel increase in tax payments – a policy counterfactual that would benefit retired individuals at the expense of the working population. The model is a useful tool for assessing whether the additional pension benefits that young households will receive in retirement are sufficient to compensate for the additional tax burden that they must bear during their working lifetime. Thus one can say whether, over the life course, a young household is better or worse off.

Annex 2: Detailed Simulated Output

Table A2.1: Summary of budgetary effects of alternative migratory scenarios in 2037

Simulation	Government Expenditure			Government Revenue			Net Revenue
	working aged	from state pension age					
	benefits	contributory pensions	other benefits	National Insurance	Income tax	Value Added Tax	
base	111,194	169,817	8,756	53,256	99,632	127,296	-9,583
scenario 1A	106,933	170,059	8,142	51,477	96,917	123,954	-12,786
	(-4,261)	(242)	(-615)	(-1,779)	(-2,715)	(-3,342)	(-3,203)
scenario 1B	105,118	170,412	8,035	51,924	97,905	124,524	-9,212
	(-6,076)	(595)	(-722)	(-1,332)	(-1,727)	(-2,772)	(371)
scenario 2A	108,584	169,776	8,463	52,490	98,268	125,772	-10,294
	(-2,610)	(-41)	(-293)	(-766)	(-1,364)	(-1,524)	(-711)
scenario 2B	106,750	170,078	8,110	53,101	99,194	126,105	-6,539
	(-4,444)	(261)	(-646)	(-155)	(-438)	(-1,191)	(3,045)
scenario 3A	106,035	170,233	8,189	50,997	96,417	123,533	-13,509
	(-5,159)	(416)	(-567)	(-2,259)	(-3,215)	(-3,763)	(-3,926)
scenario 3B	103,881	170,241	8,027	51,716	97,107	124,024	-9,302
	(-7,313)	(424)	(-730)	(-1,540)	(-2,525)	(-3,272)	(281)

Source: Authors' calculations using simulated data generated by the LINDA microsimulation model

Notes: Bracketed terms report differences between simulation counterfactual and base in £m

Table A2.2: Summary of budgetary effects of alternative migratory scenarios in 2057

Simulation	Government Expenditure			Government Revenue			Net Revenue
	working aged benefits	from state pension age contributory pensions	from state pension age other benefits	National Insurance	Income tax	Value Added Tax	
base	169,946	261,682	10,994	80,237	138,480	180,892	-43,012
scenario 1A	154,666	260,592	9,662	74,351	130,396	169,104	-51,069
	(-15,280)	(-1,090)	(-1,332)	(-5,886)	(-8,084)	(-11,788)	(-8,057)
scenario 1B	150,671	259,354	8,574	76,799	135,174	171,496	-35,129
	(-19,275)	(-2,328)	(-2,421)	(-3,438)	(-3,306)	(-9,396)	(7,883)
scenario 2A	162,312	259,964	10,197	78,424	136,687	175,221	-42,139
	(-7,634)	(-1,718)	(-797)	(-1,813)	(-1,793)	(-5,671)	(873)
scenario 2B	158,157	260,492	8,725	78,873	136,037	176,310	-36,153
	(-11,789)	(-1,190)	(-2,269)	(-1,364)	(-2,443)	(-4,582)	(6,859)
scenario 3A	152,151	259,389	10,087	74,036	129,510	167,356	-50,724
	(-17,795)	(-2,293)	(-907)	(-6,201)	(-8,970)	(-13,536)	(-7,712)
scenario 3B	148,213	259,756	8,282	75,736	133,392	169,654	-37,469
	(-21,733)	(-1,926)	(-2,712)	(-4,501)	(-5,088)	(-11,238)	(5,543)

Source: Authors' calculations using simulated data generated by the LINDA microsimulation model

Notes: Bracketed terms report differences between simulation counterfactual and base in £m