

Technical Appendix
A Contributory Migration System for Britain

Centre for British Progress

2026-02-24

Table of contents

1	NPV-Neutral Threshold Calculation	3
1.1	Data Sources	3
1.2	Earnings Interpolation	3
1.3	Public Spending Profiles	3
1.4	Tax Revenue Calculation	3
1.5	Lifecycle NPV Calculation	4
1.6	Threshold Determination	4
2	Points System Design	5
2.1	Points Formulation Used in the Calculator	5
2.2	Pass Threshold Calculation	5
2.3	Approval Decision	5
2.4	Route-Specific Application Logic	6
3	Flow Modelling	7
3.1	Data Sources	7
3.2	Age-Specific Threshold Changes	7
3.3	Elasticity Application	7
3.4	Weighted Average Effect	7
3.5	Household Impact	8
4	Aggregate Fiscal Impact	9
4.1	Conditional Income Distribution	9
4.2	Scenario Comparison	9
4.3	Total Scheme Value	9
5	ILR Extension Analysis	10
5.1	Annual Fiscal Balance	10
5.2	Cumulative Five-Year Balance	10
5.3	State Pension Eligibility	10
5.4	State Pension Contribution–Benefit Analysis	10
5.5	ILR Contribution Threshold	11
6	Configuration Parameters	12

6.1	Economic Parameters	12
6.2	Tax System (2025–26)	12
6.3	Migration Policy	12
6.4	Points System	12
7	Validation and Limitations	13
7.1	Model Validation	13
7.2	Limitations	13

This document describes the methodology for calculating fiscally neutral salary thresholds for UK skilled migration and designing a points-based visa allocation system. The analysis comprises five sequential steps.

1 NPV-Neutral Threshold Calculation

The model calculates the lifetime net present value of fiscal contributions minus public spending costs for migrants at each age and earnings percentile, then identifies break-even salary thresholds where NPV equals zero.

1.1 Data Sources

Source	Data	Usage
ONS ASHE Table 6.7a	Earnings by age band (10th–90th percentiles)	Earnings profiles
OBR Fiscal Risks and Sustainability (September 2024)	Chart 4.6: Tax and spending profiles by age	Age-specific spending and validation benchmark
OBR Economic and Fiscal Outlook (November 2025)	AWE growth, CPI projections to 2099–2100	Inflation/deflation
HM Treasury GDP Deflators	GDP deflators (September 2025 update)	Real value conversion
ONS National Life Tables	Period life expectancy by age	Trajectory length

1.2 Earnings Interpolation

ASHE data provides earnings at decile breakpoints for age bands: Under 25, 25–34, 35–44, 45–54, 55–64, 65–74, 75+. Band midpoints (20, 29.5, 39.5, 49.5, 59.5, 69.5, 80) anchor the interpolation, with an additional zero anchor at age 10. The model interpolates to single-year-of-age profiles using PCHIP (Piecewise Cubic Hermite Interpolating Polynomial) to preserve monotonicity.

Output: 101 ages (0–100) × 99 percentiles matrix of annual earnings in 2025–26 prices.

1.3 Public Spending Profiles

OBR profiles provide age-specific per-capita public spending across five categories: health (rising exponentially with age), education (concentrated in ages 5–22), welfare (working-age benefits, rising post-retirement), social care (concentrated in ages 75+), and other spending. Education and other spending are combined into a single “other costs” category for projection.

Public spending costs are held constant in real terms and discounted at the 3.5% Green Book rate.

1.4 Tax Revenue Calculation

For each (age, percentile, year) combination, the model calculates:

Income tax (three bands plus PA taper):

$$IT = (\text{taxable_basic} \times 0.20) + (\text{taxable_higher} \times 0.40) + (\text{taxable_additional} \times 0.45)$$

Personal allowance taper: PA reduced by £1 for every £2 above £100,000, reaching zero at £125,140. Thresholds frozen to 2028, then CPI-indexed.

National Insurance — Employee:

$$EE_NI = (\text{band1} \times 0.08) + (\text{band2} \times 0.02)$$

where band1 = earnings between £12,570 and £50,270; band2 = earnings above £50,270.

National Insurance — Employer:

$$ER_NI = \max(0, \text{salary} - £5,000) \times 0.15$$

Indirect Tax:

$$\text{Indirect} = (\text{salary} - IT - EE_NI) \times 0.12$$

The 12% rate is derived from empirical research on UK household indirect tax burden (VAT, excise duties, council tax, vehicle duties) from the ONS *Effects of Taxes and Benefits on Household Income* (FYE 2022).

1.5 Lifecycle NPV Calculation

For a migrant arriving at age a in year t_0 :

$$\text{NPV}(a, t_0) = \sum_{t=t_0}^T \frac{\text{Tax}_t - \text{Cost}_t}{(1+r)^{t-t_0}}$$

where T is the year when the migrant reaches expected death (from ONS life tables), $r = 0.035$ (Green Book discount rate), Tax_t is total tax revenue in year t , and Cost_t is the public spending allocation in year t .

When employment transitions are enabled, the model applies a two-state Markov process using ONS A05 SA (August–October 2025) age-specific unemployment rates and quarterly transition probabilities (E→U: 2.5%, U→E: 25%).

When percentile mobility is enabled, the model applies mean-reverting earnings transitions within deciles using calibrated annual transition probabilities between decile groups.

1.6 Threshold Determination

The break-even threshold $S^*(a)$ is the starting salary at age a such that $\text{NPV}(a, S^*(a)) = 0$. Solved via Brent’s method with bounds [£0, £200,000].

All thresholds are floored at £23,200 (2025–26 National Living Wage).

Policy thresholds include 10%, 15%, and 20% buffers above $\text{NPV} = 0$ to account for public service congestion effects, housing market externalities, and unmodelled fiscal costs.

2 Points System Design

The model converts NPV-neutral thresholds into a points-based visa allocation system that adjusts for age and household composition.

2.1 Points Formulation Used in the Calculator

Points are calculated relative to age-adjusted NPV thresholds and include sponsor plus adult-dependant earnings contributions:

$$\text{Points}_{\text{sponsor}} = \frac{\text{salary}_{\text{sponsor}}}{S^*(a_{\text{sponsor}})} \times 100$$

$$\text{Points}_{\text{dependant}, i} = \frac{\text{salary}_{\text{dependant}, i}}{S^*(a_{\text{dependant}, i})} \times 100$$

$$\text{Points}_{\text{total}} = \text{Points}_{\text{sponsor}} + \sum_i \text{Points}_{\text{dependant}, i}$$

At the relevant threshold, each earning adult contributes 100 points. Points are operationally evaluated on this household-total basis.

2.2 Pass Threshold Calculation

The pass threshold varies by household composition using a Modified OECD equivalence scale:

$$\text{PassThreshold} = 100 + (n_{\text{adults}} - 1) \times 70 + n_{\text{children}} \times 20$$

Household Member	Points Required
Sponsor (first adult)	100
Additional adult dependant	+70 each
Child (< 18)	+20 each

An individual requires 100 points. A couple of the same age requires 170 points (100 + 70). A couple with two children requires 210 points (100 + 70 + 20 + 20).

2.3 Approval Decision

$$\text{Approved} = \begin{cases} \text{Yes} & \text{if } \text{Points}_{\text{total}} \geq \text{PassThreshold} \\ \text{No} & \text{otherwise} \end{cases}$$

2.4 Route-Specific Application Logic

The calculator framework covers three policy pathways with distinct decision rules.

Skilled Worker visa. Approval requires passing mandatory screening checks and meeting the points threshold using the formulas above.

Family Visa (Spouse). Family Visa (spouse) uses the same fiscal points mechanics, with spouse treated as an adult dependant:

- *Sponsor* = resident/British/settled applicant whose income anchors the threshold denominator.
- *Spouse* = adult dependant with age-specific threshold and optional earnings contribution.
- Children add the same child-weight requirement as in Skilled Worker.

Operationally, this is the same household points engine with a different route interpretation.

Settlement (ILR). ILR is not a one-period points decision. It is assessed on year-by-year household contributions since entry:

$$\text{Threshold}_{\text{ILR}}(a) = S^*(a) \times [1 + 0.70 (n_{\text{adults}} - 1) + 0.20 n_{\text{children}}]$$

$$\text{ILR eligible if } \frac{1}{Y} \sum_{t=1}^Y \mathbf{1}[\text{HH_Income}_t \geq \text{Threshold}_{\text{ILR}}(a + t)] = 1$$

The household income threshold is the sponsor's age-specific threshold scaled by household size: one adult requires the full threshold, each additional adult adds 70%, each child adds 20%. Screening checks are route-specific and applied before the route calculation.

3 Flow Modelling

The model estimates how visa volumes would change under NPV-neutral age-based thresholds compared to the current flat £41,700 threshold.

3.1 Data Sources

Source	Data
Home Office Immigration System Statistics	Skilled Worker visa grants by year
ONS National Population Projections: Migration Assumptions, 2022-based	Age distribution of migrants by single year of age

3.2 Age-Specific Threshold Changes

For each age bracket, the percentage change is calculated against the current age-specific threshold $S_{\text{current}}(\text{bracket})$, where £33,400 applies to the 18–25 brackets and £41,700 applies to all older brackets:

$$\Delta\%_{\text{bracket}} = \frac{S_{\text{new}}^*(\text{bracket}) - S_{\text{current}}(\text{bracket})}{S_{\text{current}}(\text{bracket})} \times 100$$

Ages 18–29 see threshold *decreases* of 19% to 23%. Ages 30–39 see thresholds roughly constant (+4.7%). Ages 40+ see threshold *increases* of 42% to 150%.

3.3 Elasticity Application

Volume changes are estimated using labour demand elasticity. Let $V_{\text{baseline}}(\text{bracket})$ denote current annual visa grants for each age bracket (from Home Office data):

$$\Delta V_{\text{bracket}} = V_{\text{baseline, bracket}} \times \varepsilon \times \frac{\Delta\%_{\text{bracket}}}{100}$$

Scenario	ε	Interpretation
Low	−0.3	Inelastic demand
Central	−0.6	Moderate substitution
High	−1.2	Elastic demand

Negative elasticity means higher thresholds reduce volumes.

3.4 Weighted Average Effect

The aggregate volume change is the sum across age brackets:

$$\Delta V_{\text{total}} = \sum_{\text{bracket}} \Delta V_{\text{bracket}}$$

Young migrants (18–30) comprise approximately 60% of the flow and face lower thresholds. The net effect is an increase in migration volumes under NPV-neutral policy.

3.5 Household Impact

Total persons affected includes dependants:

$$\text{TotalPersons} = V_{\text{new}} \times (1 + \delta)$$

The Skilled Worker dependant ratio $\delta = 0.77$ (Home Office data).

4 Aggregate Fiscal Impact

The model calculates the total 75-year fiscal impact of implementing NPV-neutral thresholds, accounting for compositional shifts in the migrant population.

4.1 Conditional Income Distribution

Thresholds are minimum requirements, not typical salaries. The model calculates expected NPV conditional on passing the threshold:

$$\mathbb{E}[\text{NPV}(a) \mid s \geq S^*(a)] = \frac{1}{99 - p^*(a) + 1} \sum_{p=p^*(a)}^{99} \text{NPV}(a, p)$$

where $p^*(a)$ is the earnings percentile corresponding to threshold $S^*(a)$.

Key assumption: The model assumes uniform probability across qualifying wage percentiles (i.e., among applicants who meet the threshold, all salary levels above the threshold are equally likely). This is a simplification; in practice, the distribution may be concentrated near the threshold.

4.2 Scenario Comparison

The *counterfactual* applies current policy thresholds, which vary by age: £33,400 for migrants under 26 and £41,700 for those aged 26 and over. Expected NPV is calculated conditional on wage \geq the age-specific current threshold.

The *proposal* uses age-varying NPV+10% thresholds. Young migrants face lower thresholds (more qualify at lower salaries). Older migrants face higher thresholds (only high earners qualify). Expected NPV is calculated conditional on the age-specific threshold.

4.3 Total Scheme Value

Aggregate fiscal impact uses an inframarginal/marginal decomposition. Migrants already above the current threshold are unaffected by the policy change and retain their counterfactual NPV. Only the volume change at the margin (applicants gained or lost between the old and new threshold) generates a fiscal difference:

$$\text{ProposalYield}(a) = \mathbb{E}[\text{NPV}(a) \mid s \geq S_{\text{current}}(a)] \times V_{\text{baseline}}(a) + \mathbb{E}[\text{NPV}(a) \mid S_{\text{lower}}(a) \leq s < S_{\text{upper}}(a)] \times \Delta V(a)$$

where S_{lower} and S_{upper} are the lower and upper of the current and proposal thresholds, and $\Delta V(a) = V_{\text{new}}(a) - V_{\text{baseline}}(a)$ is the elasticity-estimated volume change.

Net benefit equals proposal yield minus counterfactual yield ($\mathbb{E}[\text{NPV} \mid s \geq S_{\text{current}}] \times V_{\text{baseline}}$) summed across age brackets.

5 ILR Extension Analysis

The model calculates the five-year fiscal balance during the probationary period before Indefinite Leave to Remain and determines required contributions for fiscal neutrality.

5.1 Annual Fiscal Balance

For each (age, salary) combination over years 2025–26 to 2029–30:

$$\text{Balance}(a, s, t) = \text{Tax}_{\text{total}}(a, s, t) - \text{Cost}_{\text{public}}(a, t)$$

$\text{Tax}_{\text{total}}$ is the sum of income tax, employee NI, employer NI, and indirect tax. $\text{Cost}_{\text{public}}$ is the age-specific spending allocation from Step 1.

5.2 Cumulative Five-Year Balance

$$\text{Balance}_{5\text{yr}} = \sum_{t=1}^5 \text{Balance}(a, s, t)$$

Applicants are classified as *fiscally positive* if $\text{Balance}_{5\text{yr}} > 0$ (taxes exceed costs) or *fiscally negative* if $\text{Balance}_{5\text{yr}} < 0$ (costs exceed taxes).

5.3 State Pension Eligibility

Migrants accumulate UK State Pension qualifying years while employed in the UK. The maximum possible qualifying years for a migrant arriving at age a and remaining until State Pension Age (SPA = 68) is:

$$QY(a) = \min(\text{SPA} - a, 35)$$

Full pension requires 35 qualifying years and pays £11,502 per year. Minimum entitlement requires 10 qualifying years. Entitlement between 10 and 35 years is pro-rata.

5.4 State Pension Contribution–Benefit Analysis

NI contributions comprise employee NI (8% main, 2% additional) plus employer NI (15% above £5,000).

Nominal analysis (undiscounted):

Scenario	Years	Annual Salary	Total NI Paid	Total Pension Received	Ratio
Minimum at LEL	10	£6,500	£2,250	£65,720	29×
Minimum at LEL	35	£6,500	£7,875	£230,040	29×
At £30k salary	10	£30,000	£51,440	£65,720	1.3×

Scenario	Years	Annual Salary	Total NI Paid	Total Pension Received	Ratio
At £30k salary	35	£30,000	£180,040	£230,040	1.3×

LEL is the Lower Earnings Limit (£6,500 per year), the minimum to earn a qualifying year. At LEL, only employer NI applies: $(£6,500 - £5,000) \times 15\% = £225$ per year, totalling £2,250 over 10 years or £7,875 over 35 years. Pension received equals $(\text{qualifying years} / 35) \times £11,502 \times 20$ years retirement.

NPV analysis (discounted at 3.5%):

Arrival Age	Salary	NPV NI Contributions	NPV Pension Receipts	Ratio
25	£38,700	£76,000	£24,000	0.32×
35	£38,700	£58,000	£23,000	0.40×
45	£38,700	£41,000	£21,000	0.51×
55	£38,700	£24,000	£18,000	0.75×

NPV NI is the present value of annual NI contributions over working years. NPV Pension is the present value of pension receipts during retirement (starts at SPA 68). Ratios below 1 indicate NI contributions exceed discounted pension value (net contributor).

In nominal terms, the State Pension appears heavily subsidised at low earnings. In NPV terms, migrants at typical skilled worker salaries are net contributors to the pension system because their NI payments occur early and pension receipts are heavily discounted.

5.5 ILR Contribution Threshold

For applicants with a negative five-year balance after the probationary period, the model calculates the total fiscal position including future State Pension costs. PensionSubsidy is the expected NPV of pension receipts minus the NPV of NI contributions over the migrant’s working life (positive when pension receipts exceed contributions):

$$\text{PensionSubsidy}(a, s) = \max(0, \text{NPV}_{\text{Pension}}(QY(a)) - \text{NPV}_{\text{NI}}(a, s))$$

$$\text{TotalFiscalPosition} = \text{Balance}_{5\text{yr}} - \text{PensionSubsidy}(a, s)$$

$$\text{RequiredILRFee} = \max(0, -\text{TotalFiscalPosition})$$

This contribution could be collected as an ILR application fee to offset expected fiscal costs.

6 Configuration Parameters

6.1 Economic Parameters

Parameter	Value	Source
Discount rate	3.5%	HM Treasury Green Book
Retirement age (SPA)	68	UK State Pension Age
Indirect tax rate	12%	ONS <i>Effects of Taxes and Benefits on Household Income</i> (FYE 2022)

6.2 Tax System (2025–26)

Band	Threshold	Rate
Personal allowance	£0 – £12,570	0%
Basic rate	£12,571 – £50,270	20%
Higher rate	£50,271 – £125,140	40%
Additional rate	£125,141+	45%

Parameter	Value
Employee NI (main, up to UEL)	8%
Employee NI (additional, above UEL)	2%
Employer NI	15% above £5,000

6.3 Migration Policy

Parameter	Value
Current threshold (general)	£41,700
Current threshold (new entrant / shortage)	£33,400
Minimum wage floor	£23,200

6.4 Points System

Parameter	Value
Sponsor baseline	100 points
Adult dependant weight	70 points
Child weight	20 points

7 Validation and Limitations

7.1 Model Validation

- Tax calculations verified against HMRC ready reckoners.
- Spending profiles sourced from OBR *Fiscal Risks and Sustainability* (September 2024), Chart 4.6 figures.
- Break-even thresholds verified to produce $NPV = 0$ at calculated salaries.
- Points system test cases confirm expected approval patterns.

7.2 Limitations

- The model uses individual-level analysis and does not fully model dependant earnings trajectories.
- It assumes static equilibrium with no dynamic labour market adjustments.
- It excludes spillover effects (productivity, innovation).
- It uses national averages with no regional variation in costs or wages.
- Labour demand elasticity is uncertain.
- The model assumes uniform probability across qualifying wage percentiles.