



**Centre for
Economic
Performance**

Occasional Paper

No.64

Revised November 2024
(Replaced September 2024
version)

The apprenticeship guarantee

David Frayman

Abstract

This paper analyses the implications of guaranteeing the offer of an apprenticeship place up to level 3 to all suitably qualified applicants aged 21 and under. The long-term case for this is found to be compelling. In present value terms, the expected benefit to the individual of starting an apprenticeship is around £34,000 over their working life. Annual gross costs to the government of implementing the guarantee are estimated to be only 40% of what is projected to be raised by the apprenticeship levy, whilst the flow of additional tax and welfare savings means the investment in each cohort is expected to pay for itself by 16 years after starting.

Notes:

*Since education is a devolved policy area, the numbers associated with this policy analysis relate to England. However, it can be assumed that similar costs and benefits of an additional apprenticeship start apply in the other nations of the United Kingdom, so the conclusions extend to the whole country.

**A previous version of this paper analysed the costs and benefits of the additional government spending required to implement a guarantee for under 25s. Here, we consider the total investment in each cohort of under 22 apprentices that will need to be paid for out of fiscal revenues.

Keywords: apprenticeship, skills, training.

JEL: D61, I23, I24, J24.

David Frayman, Centre for Economic Performance at LSE.

This paper provides background analysis to [Value for Money: how to increase wellbeing and reduce misery](#) (D. Frayman, C.Krekel, R. Layard, S. MacLennan and I. Parkes). CEP Special Report 44. (2024).

Published by
Centre for Economic Performance
London School of Economics and Political Science
Houghton Street
London WC2A 2AE

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means without the prior permission in writing of the publisher nor be issued to the public or circulated in any form other than that in which it is published.

Requests for permission to reproduce any article or part of the Occasional Paper should be sent to the editor at the above address.

© D. Frayman, submitted 2024.

An apprenticeship guarantee for 16- to 21-year-olds

David Frayman, London School of Economics

Background

The UK has a relatively poor record of providing opportunities to learn skills for the around half of young people who do not attend university. Over a third of 18-year-olds in England are not undertaking any education or training, significantly higher than in the major EU economies¹. Concerningly, recent trends have been in the wrong direction. The number of apprenticeship starts in England has significantly declined since the mid-2010s, when it hovered at around half a million² (see Figure 1). This is not due to a lack of demand: in the government's Find An Apprenticeship matching scheme, three times more young people apply than the number of places available³. The decline in apprenticeship starts has also been associated with a shift in the composition of starts towards higher levels, older ages and those from less deprived backgrounds⁴. For young people in disadvantaged areas, it seems the pathway apprenticeships provide into a skilled career is narrowing, with potentially large implications for their future work and wellbeing.

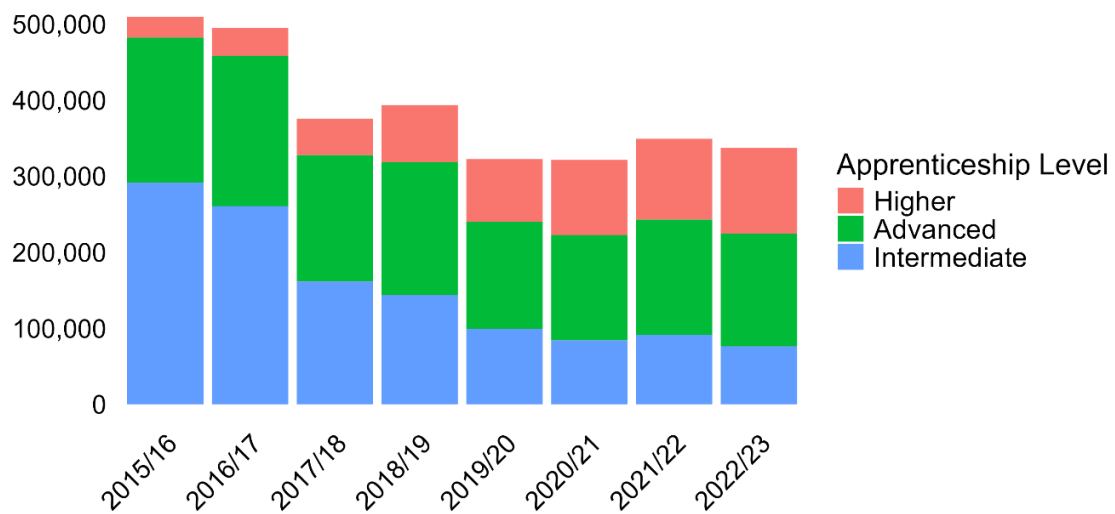
¹ Department for Education data: Participation in education, training and employment age 16 to 18 estimates for England, 2022. <https://explore-education-statistics.service.gov.uk/find-statistics/participation-in-education-and-training-and-employment>.

² A small part of this may be explained by a mild shrinkage in the size of the 16-24 age cohort since the mid-2010s. It is also worth noting that a significant part of the decline may have been the disappearance of low-quality apprenticeships – at level 2 in particular – with the shift from apprenticeship frameworks to more rigorous apprenticeship standards. Whilst this is in some ways desirable, potential level 2 apprentices are at risk of going through their careers with low skill and it is not desirable that they undertake no training whatsoever.

³ In the year 2020/2021, 142,000 under 25s applied for 47,000 places. Department for Education, Apprenticeship vacancies: demand and supply data, July 2021.

⁴ Young individuals from disadvantaged backgrounds are very poorly represented in the highest levels of apprenticeship, which is where there has been significant growth. Those who were on free school meals at school are in fact more likely to start a university degree than to study for a level 6 or 7 (“degree”) apprenticeship. Cavaglia, C., McNally, S. and Ventura, G., 2022. *The Recent Evolution of Apprenticeships: Participation and Pathways*. CVER Research Discussion Paper 039.

Figure 1. Apprenticeship starts in England by level.



Source: Department for Education (DfE)

In 2009, Parliament passed the Apprenticeships, Skills, Children and Learning Act, obliging the government to ensure an apprenticeship place to all suitably qualified 16- to 18-year-olds. This guarantee was subsequently repealed. The 2024 Labour Party Manifesto revived the spirit of this idea with a commitment to ‘guarantee training, an apprenticeship, or help to find work for all 18- to 21-year-olds’. Given the limited scope for further expansion of the university system and the long-term benefits of employment that provides training, a promising way to realise this would be a target for every suitably qualified 16- to 21-year-old who has left school and wants to start an apprenticeship up to level 3 to receive at least one viable offer of a place. Given the demand for apprenticeship places, it seems reasonable to assume this would at the least require a doubling of the proportion of 16- to 21-year-olds starting an apprenticeship up to level 3 each year, achieved over the course of this Parliament (by 2028).

The existing system for funding apprenticeships

Currently, apprenticeship training is supported by the apprenticeship levy. This is a tax on large firms – employers with an annual pay bill over £3 million pay 0.5% over this threshold – that can be reclaimed if the paid-in funds are used for off-the-job apprenticeship training (which creates an incentive for employers to provide more apprenticeships). The levy raises £4 billion a year, projected by the OBR to rise in nominal terms to £4.6 billion by the end of this Parliament (2028/29). A significant part of this is not reclaimed by firms and can be used by the government for other purposes, including funding apprenticeship training in SMEs.

A large share of the levy funds used by large firms goes to fund higher apprenticeships (level 4 and above⁵), generally taken by older workers and much

⁵ Levels 6 and 7 are sometimes distinguished as degree apprenticeships.

more expensive than lower levels. The National Audit Office has supported the view that the growth in higher apprenticeships partly represents the rebranding of professional development programmes to make them eligible for use of levy funds⁶. We argue funds raised by the levy could be being used more efficiently to support unmet demand for apprenticeship training amongst young people. Apprenticeships at level 3 or below are key to addressing low skill since they are the type of apprenticeship someone leaving academic education between the ages of 16 and 18 is likely to take. Level 2 apprenticeships (and likely the recently proposed foundation apprenticeships) generally teach the basic skills for roles such as hair stylist or machine operative, whilst level 3 apprenticeships provide more specialised skills for roles such as senior hair stylist or engineering technician. Level 4+ apprenticeships are a form of higher education, and we therefore treat them as such from a funding point of view⁷.

The cost of expanding apprenticeship starts for young people

We estimate 105,500 16- to 21-year-olds started a level 2 or 3 apprenticeship in 2023/24⁸. Off-the-job training costs for an apprentice that completes their qualification are on average £6,900 for level 2 and £8,400 for level 3⁹. Assuming only half of the costs of a training course are paid for those starts that do not complete their apprenticeship¹⁰, we estimate that it currently costs £634 million to provide off-the-job training to 16- to 21-year-olds taking apprenticeships at level 2 or 3. Based on the split within levels 2 and 3 between levy and non-levy paying firms, around £385 million of this cost is incurred by levy firms and around £250 million by SMEs.

Doubling the proportion of 16- to 21-year-olds starting apprenticeships up to level 3 by 2028 would require around 230,000 starts in total (adjusting for a 10% increase in the size of that age group), implying total training costs of £1.4 billion in today's prices¹¹. This may include foundation apprenticeships, but, without further details on this new type of apprenticeship, we treat these starts as part of the level 2 group.

⁶ National Audit Office, *The apprenticeships programme*, 6 March 2019, p9. On this issue, see also: EDSK, *Runaway training*, January 2020, p2. This is one reason why a very large share of higher apprenticeships are in business and administration, and not well dispersed across the sectors in which many young people will work.

⁷ From September 2025, higher apprenticeships will be eligible to be funded through the Lifelong Learning Entitlement (a government loan of up to £37,000). This would create a similar system to the way higher academic education is financed by the learner through a student loan.

⁸ Around 70,000 16- to -18-year-olds started a level 2 or 3 apprenticeship in 2023/24. The number of 19- to 24-year-olds was approximately the same. In the absence of data on starts by individual age years, we simply assume starts in the 19-24 range are evenly spread across years. This means that half of the 70,000 starts in the 19-24 age group were aged 19 to 21.

⁹ This is composed of training costs of £5,371 for level 2 and £6,815 for level 3 plus an average of £1,554 for the end-point assessment (EPA). The Institute for Apprenticeships and Technical Education & Education and Skills Funding Agency (EFSA), 2020. *Cost of delivering apprenticeship standards*.

¹⁰ A majority of non-completers leave before one year and may undertake minimal training. However, a significant part of training costs will need to be paid to the training provider up front. Therefore, 50% seems a reasonable assumption even if non-completers are more likely to leave early in the apprenticeship.

¹¹ This assumes the current ratio of level 2 to level 3 starts remains constant.

This would account for less than a third of the £4.6 billion a year projected to be raised by the levy in 2028/29 (£848 million of costs to be paid by levy firms using their own levy account funds and £558 million by SMEs from the significant amount of levy funds unspent by large firms or from levy transfers¹²).

A large expansion of apprenticeship places will also require additional costs to ensure sufficient supply. One aspect of this is reducing the administrative and information barriers to taking on apprentices, especially for SMEs, and improving the infrastructure that facilitates the flow of young people into starts. This could be achieved by providing funds to local governments to invest in setting up and improving dedicated apprenticeship teams across the country. We estimate this would cost £76 million a year (see Annex 1).

For large firms, ringfencing a share of what is raised by the apprenticeship levy as part of forthcoming reforms could provide the additional financial incentive to offer new places to 16- to 21-year-olds. For SMEs who do not pay the levy, the government may have to offer an alternative financial incentive¹³. During the Covid-19 pandemic, firms were offered £3,000 per apprentice of any age to encourage employers to continue to take on new apprentices¹⁴. We suggest one means of creating new SME places would be to offer a new £3,000 incentive to SMEs in areas with a higher-than-average proportion of under 21s not in education, employment or training to take on level 2 and 3 apprentices aged 21 and under¹⁵, which could be shared with the training provider to ensure a training place. Assuming this applies to half of the new total of level 3 and under starts in SMEs¹⁶, this presents a cost to the government of £107 million a year. This would be additional to the £1,000 subsidy currently offered to all firms and training providers for taking on apprentices aged 16-18 or who have an Education, Health and Care Plan or have been in care (groups

¹² Levy-paying employers can transfer up to 50% of their paid-in levy funds to a different employer. An obvious candidate for this would be an SME or affiliated firm in their supply chain.

¹³ Although apprenticeship training offers a benefit to the firm in terms of higher productivity, firms are still likely to underprovide training. The most well-known of these market failures is that the benefits of training which provides general skills transferable to other firms may be “stolen” by a firm that did not pay the costs of the training. Becker, G.S., 1962. Investment in Human Capital: A Theoretical Analysis. *Journal of Political Economy*, 70(5), pp. 9-49. Acemoglu, D., and Pischke, J-S., 1998. Why Do Firms Train? Theory and Evidence. *The Quarterly Journal of Economics*, 113(1), pp. 79-119. Muehlemann, S. and Wolter, S.C., 2014. Return on investment of apprenticeship systems for enterprises: Evidence from cost-benefit analyses. *IZA Journal of Labor Policy*, 3(1).

¹⁴ This started in August 2020 as a £2,000 payment for 16- to 24-year-old apprentices and £1,500 for 25 and over. From 1 October 2021 to 31 January 2022, employers received £3,000 for all eligible apprentices. There is no causal evidence of the effect of this, but there was no decline in apprenticeship starts during this period – indeed, there was a slight uptick in starts in the year 2021/2022 – which might indicate it helped continue apprenticeship employment during the pandemic.

¹⁵ In labour markets with low youth unemployment and a high proportion of young people in education, incentives would have a high degree of deadweight.

¹⁶ We assume the subsidy would be well-designed, following the structure of the current under 18 subsidy where half is paid after 90 days and half after 365 days. Around three quarters of level 2 and around two thirds of level 3 non-completers leave before one year (so the firm will only get the first half of the subsidy), and some of these will leave before 90 days (in which case the firm gets nothing). It therefore seems reasonable to assume only half the subsidy would need to be paid for non-completers.

harder to get employers to take on than 19- to 21-year-olds). We estimate this currently costs the government £110 million a year for level 2 and 3 apprenticeship starts¹⁷, with the growth in starts implying an increase to £242 million a year.

Summing these costs (see Table 1), we estimate the total cost of supporting 230,000 apprenticeship starts for 16- to 21-year-olds in 2028 would be £1.82 billion a year (£7,800 per start). This is well within what is possible within the current levy. Furthermore, the net cost to the government will fall over time due to changes in tax and welfare spending. We now proceed to quantify this, as well as the benefits to the individual from starting an apprenticeship.

Table 1: Gross annual cost in 2028/29 (billions)	
Improvements to system	£0.08
Incentives	£0.35
Training costs	£1.40
Total	£1.82

The benefits of doing an apprenticeship

It is well established in the economic literature that the economic returns to education and training are large over a lifetime¹⁸. Previous research has produced credible evidence of substantial effects on the probability of being in employment and wages from doing an apprenticeship¹⁹. The Department for Education estimates achieving a level 2 apprenticeship increases the probability of being in employment by 4 percentage points and the wage for those in employment by 12%²⁰. Taking a level 3 apprenticeship provides an additional 3 percentage point improvement in the probability of being in employment and a 13% increase in the wage when compared to those with a level 2 apprenticeship. These figures do not account for the opportunity value of taking an apprenticeship (that it opens up the possibility of

¹⁷ This is based on the same assumptions about the relative cost of non-completers as for the proposed £3,000 subsidy.

¹⁸ Chetty, R., Friedman, J. N., and Rockoff, J. E., 2014. Measuring the Impacts of Teachers II: Teacher Value-Added and Student Outcomes in Adulthood. *American Economic Review*, 104(9), 2633-2679.
Psacharopoulos, G., and Patrinos, H. A., 2018. Returns to investment in education: a decennial review of the global literature. *Education Economics*, 26(5), 445-458.

¹⁹ Cavaglia, C., McNally, S. and Ventura, G., 2020. *Do Apprenticeships Pay? Evidence for England*. *Oxford Bulletin of Economics and Statistics*, 82(5), pp.1094-1134.
Department for Education (DfE), 2021. *Measuring the Net Present Value of Further Education in England 2018/19*.

²⁰ This uses the Bibby et al. (2014) method of comparing those who finish an apprenticeship with observably similar non-completers in a difference-in-differences set-up. Bibby, D., Buscha, F., Cerqua, A., Thomson, D. and Urwin, P. (2014). *Further education: comparing labour market economic benefits from qualifications gained*. Department for Business Innovation and Skills Research Paper No. 195.

taking additional levels of apprenticeship), which may be significant but is omitted from analysis due to a lack of evidence on opportunity values.

We use these estimates as the basis for modelling the flow of benefits from taking an apprenticeship. This is considered over 40 years (the large majority of an individual's working life). Benefits are always expressed per start, including the nearly half who will not complete²¹ and aggregating across all levels. This makes the estimated benefit per start a weighted average across levels. We consider their expansion as a single policy because they are complements rather than substitutes: lower levels are a path into higher levels, and those starting different levels have different prior qualifications (they are generally not choosing between).

Quantifying changes to income

The pool of potential level 2 apprentices will tend to have limited academic achievement and, in combination with being inexperienced, this means they can expect to earn a low wage. We base calculations on an average wage for this group (absent achieving an apprenticeship) of £9.5 pounds per hour, around the median wage for the relevant age group²². This gives a weekly gross income of £276²³, which is assumed to grow over time in line with the stylised facts about the experience-earnings profile²⁴, starting at a rate of 4% a year.

The level 2 wage premium is applied to this wage for all years over which we estimate benefits, excluding the period during which the apprenticeship is being

²¹ In 2022/23, the achievement rate for level 2 was 53.9% and for level 3 was 54.7%. Whilst this is concerning low, we do not allow for any improvement in these figures. We conservatively do not account for any benefits to non-completers but do account for the partial costs they impose. Department for Education, 2024. *Apprenticeship achievements: An update for the sector*.

²² This lies between the non-apprentice median wage in 2023 of £8.09 for 16- to 17-year-olds and £10.45 for an 18-year-old. 2023 Annual Survey of Hours and Earnings (ASHE). The government has announced an increase in the national minimum wage for these age groups in April 2025, which would place this figure in between the minimum wage for 16- to 18-year-olds £7.55 and for 18- to 20-year-olds of £10 (which fits with starts being a mix of these age groups).

²³ Based on a working week of 29 hours. The average paid hours per week for all employees is around 33. However, hours worked are negatively related to being in the 16-21 age group, so we adjust down to 29 hours per week to account for more young people being in part time work (even once we account for those in education). Some of subsequent earnings growth can therefore be interpreted as an increase in hours worked.

<https://www.ons.gov.uk/economy/grossdomesticproductgdp/articles/averagehoursworkedandeconomicgrowth/2024-01-22>

²⁴ The experience-log earnings profile is concave, with marginal returns to experience higher in proportional terms when younger and flattening out in the later years of working life. We approximate this profile linearly, assuming 3.5% returns to an additional year of experience in the first 15 years after starting an apprenticeship, 1.5% in the next 15 years, and no returns in the subsequent 10 years as further career progression is cancelled out by reduced hours. These returns to experience are added to 0.5% a year national growth in real wages, based on current trends. Lemieux, T., 2003. *The "Mincer Equation" Thirty Years after Schooling, Experience, and Earnings*. Working Paper No. 62. Center for Labor Economics, University of California, Berkeley. The Department for Business, Innovation & Skills, 2013. *The Impact of University Degrees on the Lifecycle of Earnings: Some Further Analysis*. Research Paper No. 112. Office for Budget Responsibility (OBR), Economic and fiscal outlook March 2024.

taken when we apply a 25% wage penalty²⁵. For comparison, in the first year this gives a weekly gross income for someone who has achieved a level 2 apprenticeship of £309²⁶, £33 a week more than someone without a level 2 apprenticeship (£1,716 more a year). To account for the fact that part of the productivity gain from higher skill goes to the firm, we additionally add a productivity spillover of 35% of the gross wage difference to total benefits²⁷.

For someone who has completed a level 3 apprenticeship, the level 3 wage premium is applied to the level 2 wage. This assumes that those taking level 3 will have already achieved skills equivalent to a level 2 apprenticeship²⁸. The weekly gross income in the first year for someone who has completed a level 3 apprenticeship is therefore assumed to be £349, £40 a week more than someone who has only completed a level 2 apprenticeship (£2,080 more a year). As for level 2, we apply a 25% wage penalty during the period in which the apprenticeship is being taken²⁹ and a productivity spillover in the years after completion of 35% of the gross wage difference.

The wage benefit is calculated on the group of individuals who would be in employment regardless of taking an apprenticeship – assumed to be 90% at the start, declining to 80% in the last 10 years of the 40-year period over which benefits are measured to reflect declining employment rates at later ages³⁰. Added to this is the monetary benefit from reduced unemployment for the 3 to 4 percentage points of completers who are in work due to achieving an apprenticeship. This is calculated by

²⁵ For those aged 16-20, the median wage of an apprentice is ~75% of a non-apprentice (2023 Annual Survey of Hours and Earnings (ASHE)). The same proportional difference applies between the apprentice and non-apprentice minimum wage for someone aged 18-20. Completing an apprenticeship typically takes 12-18 months for level 2 (in 2022/23, the average duration was 498 days). We take the mid-point of this range (15 months) when applying the wage penalty.

²⁶ Calculating the wage premium in the first year allows for comparison, but when modelling we only use post-apprenticeship income from year two onwards (after the apprenticeship is completed).

²⁷ This figure comes from the Department for Education based on a general review of the literature on higher-level qualifications and productivity. The limited empirical literature on vocational training and productivity spillovers has tended to find larger spillovers from training. For example, Dearden et al. (2005) find only half of the benefit is captured in higher wages (implying 100% spillover). We opt to follow the Department for Education in being conservative on this assumption. Department for Education (DfE), 2021. *Measuring the Net Present Value of Further Education in England 2018/19*. Dearden, L., Reed, H. and Van Reenen, J., 2005. *The Impact of Training on Productivity and Wages: Evidence from British Panel Data*. CEP Discussion Paper No 674, February 2005.

²⁸ Around a third of those who start level 3 have already taken a level 2 apprenticeship, whilst the others will tend to have significantly better academic qualifications than those starting level 2. Cavaglia, C., McNally, S. and Ventura, G., 2022. *The Recent Evolution of Apprenticeships: Participation and Pathways*. CVER Research Discussion Paper 039.

²⁹ This gives a starting wage of £8.0 for a level 3 apprentice. This falls in the middle of the median apprentice wage for an 18-year-old of £7.72 and the median apprentice wage for 19- to 20-year-olds in their first year of £8.29 (2023 Annual Survey of Hours and Earnings (ASHE)). Completing a level 3 apprenticeship typically takes 18-24 months (in 2022/23, the average was duration 629 days). We take the mid-point of this range (21 months) when applying the wage penalty.

<https://www.ucas.com/apprenticeships/england/level-3-advanced>

³⁰ 90% is the employment rate for those in the 25 to 34 age group. Employment rates are lower for under 25s, but we factor in that those seeking an apprenticeship have left (or are leaving) education and are actively seeking work. ONS LFS A05SA (2024).

subtracting estimated out-of-work benefit income from the expected income earned by someone who has achieved an apprenticeship (out-of-work benefit income starts low but rises with age as eligibility and uptake increases – see Annex 2).

The gains to gross income are split between the worker and the Exchequer based on current taxation rates and thresholds, assuming these will stay constant in real terms (see Annex 3 for a detailed description of the treatment of taxation). Monetary benefits are then discounted at a rate of 3.5% a year, following the Treasury Green Book³¹.

Our estimates of total discounted monetary benefits per start over a 40-year period are a £29,000 increase in the disposable income of the individual, a £11,500 productivity benefit to firms not captured in higher wages, and £18,500 additional taxation and £2,500 in welfare savings to the Exchequer (all in 2023/24 prices).

The psychological benefits of employment

Work plays a large role in determining wellbeing beyond income. Perhaps most relevant for those taking an apprenticeship is the reduced probability of experiencing unemployment and its associated psychological harms. An extensively replicated finding is that unemployment has a large, negative effect on life satisfaction after changes to income have been accounted for. Estimates range from a reduction of -0.3 to -1 on a 0-10 scale³². Estimates for the UK tend to be slightly lower in magnitude than Germany (the other country on which this literature has focused), and we take a value of -0.5 as the average non-pecuniary effect on life satisfaction of being unemployed in the UK.

We monetise this using the Treasury Green Book supplementary guidance on wellbeing valuation of an additional point of life satisfaction experienced over one year – a ‘WELLBY’ – of £15,258 (in 2023/24 prices). This means those who avoid unemployment due to achieving an apprenticeship receive a further benefit to their wellbeing equivalent to £7,629³³ for each year they are in work. Based on the increase in employment probability for those starts that complete their apprenticeship, this gives an expected monetised benefit of £4,500 per start over 40 years (discounting at a rate 1.5%³⁴).

Policy discussion

The long-term case for expanding apprenticeship opportunities for young people in England appears clear. Over the course of a working life, getting a young person to

³¹ This can be broken down into 0.5% time preference, 1% catastrophic risk and 2% from accounting for the effect of real income growth on the marginal utility of income in the future.

³² A review of the evidence by this author can be found here: https://docs.google.com/spreadsheets/d/1_xhyAQenfbPQvJGKuHfI8KEdaKMCCgin3wNcqBMh8lY/edit?usp=sharing

³³ This also applied for the period during which the apprenticeship is being completed (for those who complete).

³⁴ For directly measured wellbeing effects, we discount the change in life satisfaction at a rate of 1.5% before monetising. The discount rate for wellbeing is lower because changes in the marginal utility of income are not relevant, so it is only the sum of a time preference of 0.5% and a catastrophic risk of 1%.

start an apprenticeship is expected to deliver them £34,000 worth of benefits. From the perspective of the government, the initial investment of £7,800 per start is paid off in higher tax and welfare savings 16 years after each cohort begins their apprenticeships.

As costs and benefits are per start, the analysis in this paper applies to any increase in apprenticeship starts. For a large-scale expansion of the kind considered here, effort may need to be taken to mitigate a trade-off between quantity and quality, as has been argued to characterise the expansion of apprenticeship starts in the early 2010s. One key difference with respect to the early 2010s is the replacement of apprenticeship frameworks with more rigorous apprenticeship standards (which, for example, require an external end-point assessment). There is also now a statutory 20 per cent minimum for off-the-job training. As part of providing funding to subsidise new starts in SMEs, the government should also direct local government to prioritise apprenticeships in sectors that have the greatest local skills shortages and where returns to apprenticeships have been shown to be high (which may have cost implications).

It is worth emphasising that apprenticeships are not the end of the story for ending low skill. Vocational education in the UK can be improved more broadly. This includes increasing the availability of pre-apprenticeship courses in further education that equip young people with the necessary skills to start an apprenticeship³⁵. Improvements in the quality of class-based vocational training offered to both apprentices and non-apprentices would also be valuable³⁶.

Expanding apprenticeship starts is also not a substitute for ensuring high quality academic education at all levels. Indeed, they are complements – one barrier to more apprenticeship starts among young people is poor GCSE attainment. For those well-suited to higher education, the returns to attending university can be very large, and increasing participation in academic education at later ages has been a generally welcome development over the past two decades. However, arguably too much focus has gone on getting more young people into higher education relative to the far too large group not doing any form of education or training at the age of 18.

³⁵ This is especially relevant for those with a weak academic record, who suffer from a negative signalling effect and can struggle to get an apprenticeship due to being viewed as underqualified. Pre-apprenticeship courses would increase both the demand for apprenticeships and the supply of firms willing to take them. Since this would be a policy in its own right that would generate its own benefits and costs, we did not include it in our analysis here.

³⁶ Only 58% of training providers covered by inspections in 2017/18 were rated 'good' or 'outstanding' by Ofsted for apprenticeships. These providers tended to train higher numbers, but around a third of apprentices in that year were still trained by providers rated by Ofsted as 'inadequate' or 'requires improvement'. National Audit Office, *The apprenticeships programme*, 6 March 2019, p9.

Conclusion

This paper finds strong support for greater investment in the 'other half' of young people who do not attend university. The annual cost to the government of supporting double the current proportion of 16- to 21-year-olds starting apprenticeships up to level 3 could be covered by ringfencing 40% of what is raised by the apprenticeship levy and would pay for itself. Forthcoming reforms of the levy should take account of the potential cost-effectiveness of targeting funds at apprenticeship training for young people.

Methodological Annexes

Annex 1 Costs of support for local apprenticeship systems

A plausible estimate of the staff required would be an average of 10 staff per local authority. This implies a total of around 1,500 additional employees nationally. Cost per employee is taken to be £50,000, including overheads, employer national insurance and pensions. This is comparable to similar public sector roles such as job centre employees. In total, this would require central government to provide £76 million a year to local governments.

Annex 2 Out-of-work benefits income

Benefit entitlements for those who would be out of work if they had not taken an apprenticeship are based on the typical starting age of 17 for a level 2 apprenticeship and 19 for level 3³⁷. Those under 18 are not eligible to claim Universal Credit and entitlements become more generous upon reaching 25. Generosity also depends on whether the individual is living as a couple. Based on the shares in the England and Wales Census 2021, we assume 11% of young adults aged under 24 live with a partner, rising to 54% of those aged over 25 and 70% for those who have been in the labour market more than 15 years. Accounting for the fact that a substantial share of young people who out of work are not eligible for or do not claim out-of-work benefits, we assume no claims from those living with their parents. Based on the shares in the England and Wales Census 2021, we assume 56% of young adults aged under 24 and 25% of aged over 25 live with their parents, with this ending entirely after 15 years of labour market experience.

We assume generosity does not increase in real terms over time, but payments do rise in line with inflation. The standard allowances of Universal Credit³⁸ are £311.68 for single under 25s, £393.45 for single over 25s, £489.23 for under 25s who live with a partner and £617.60 for over 25s who live with a partner. Based on the pattern of growing likelihood to claim incapacity benefits with age, after 15 years of experience in the labour market we assume 25% of claimants are also receiving an additional £416 for limited capability for work and work-related activity, rising to 50% after 30 years.

One omission from this analysis is in-work benefits. On gaining work, an individual does not lose all entitlement to Universal Credit (this tapers off at a rate of 55p in the £ for earnings above a work allowance determined by living arrangements and housing costs). Accounting for this would significantly increase the complexity of modelling but make a relatively small difference to calculations. Welfare savings to the government are small when compared to changes in taxation. It will also not alter

³⁷ Cavaglia, C., McNally, S. and Ventura, G., 2020. Do Apprenticeships Pay? Evidence for England. *Oxford Bulletin of Economics and Statistics*, 82 (5), pp.1094-1134.

³⁸ The new style Jobseeker's Allowance can be claimed at the same time as Universal Credit, although it is deducted from the Universal Credit payment and may not mean a person gets any extra money. New style JSA requires two full tax years of NI contributions prior, which we assume most young people looking for level 2 and 3 apprenticeships won't have. It also only lasts up to 182 days as standard. We therefore ignore this as a minor factor.

the net benefit of the policy since it will be factored into the benefits and costs at the same time³⁹ (as a benefit to the individual and a cost to the government).

Annex 3 Taxation

National insurance is deducted at 8% for the employee on labour income above £242 a week⁴⁰ and 15% for the employer on wages paid above £96 a week. For under 21s and those under 25 and doing an apprenticeship, we assume employers do not pay national insurance since the threshold in those cases is well above likely earnings⁴¹. For calculating national insurance, we assume individuals work evenly across the year. Income tax is deducted at a rate of 20% on annual earnings above £12,570 a year⁴². We assume tax thresholds stay constant in real terms (updating of thresholds cancels out previous fiscal drag).

We account for the change to VAT receipts by multiplying the change in post-tax income by a conversion factor based on the marginal propensity to consume and the proportion of household spending on which VAT is applied. We take a high marginal propensity (MPC) to consume of 0.7. This is reasonable because the MPC is higher for those with lower-than-average incomes⁴³, as well as for younger people⁴⁴. The effect of taking an apprenticeship is also on permanent income, for which estimates of MPCs tend to be much higher than for one-off income shocks. An average of 50% of household consumption is taxed at a 20% VAT rate, 2.5% at 5% and the rest is untaxed⁴⁵. This leads to an average rate of VAT on each unit of additional consumption of 10%. Thus, the change in VAT receipts to government from a £1 increase in net income is taken to be £0.07.

³⁹ Note that, since the benefit-cost ratio is a non-linear operation, adding to the numerator and denominator at the same time will (except when they are the equal) change the benefit-cost ratio.

⁴⁰ On income above £967 per week, employees pay then 2% on earnings. Such earnings will be extremely rare for the workers considered here and can safely be ignored.

⁴¹ This is again set at £967.

⁴² The next threshold of £50,270, above which income is taxed at 40%, which is above the typical incomes considered here.

⁴³ Jappelli, T. and Pistaferri, L., 2014. Fiscal Policy and MPC Heterogeneity. *American Economic Journal: Macroeconomics*, 6(4), pp.107–136. Available at: <http://dx.doi.org/10.1257/mac.6.4.107>.

Canbary, Z. and Grant, C., 2019. *The Marginal Propensity to Consume for Different Socio-economic Groups*. Working Paper No. 1916, Brunel Economics and Finance Working Paper Series.

⁴⁴ Dynan, K.E., Edelberg, W. and Palumbo, M.G., 2009. The Effects of Population Aging on the Relationship among Aggregate Consumption, Saving, and Income. *American Economic Review*, 99(2), pp.380-386.

⁴⁵ <https://obr.uk/forecasts-in-depth/tax-by-tax-spend-by-spend/vat/>