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# Tax Incentives for Individual Learning: **A Feasibility Study**

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# Executive Summary

**In brief:** While the vast majority of work-related training is funded by employers or the government, direct spending by individuals is substantial. There is a case for considering changes to tax policy on work-related training paid for by individuals to bring it in line with current policy on training paid for by companies. Based on estimates in this report, a universal, refundable tax credit for work-related training would carry an initial cost to the Exchequer of around £300 million per year, and substantially less in the medium to long-run.

The UK tax system allows companies to deduct training expenses (with some exceptions) from their revenues when determining their taxable income, but this provision does not extend to training paid for directly by individuals<sup>1</sup>. While the UK is by no means unique in this respect, a large number of OECD and EU countries have tax measures in place aimed at incentivizing investment in work-related training by individuals.

Despite their relatively widespread use internationally, little is known regarding the effectiveness and cost of such approaches and there is no previous study offering a comprehensive assessment of the feasibility and likely impact of introducing tax incentives for individuals investing in training in the UK. The aim of this report is to identify and assess possible ways forward, with a view to contributing to the policy debate in this area.

This report presents results from an economic model developed using data from the UK Labour Force Survey (LFS) and the UK Commission's Employer Skills Survey 2015 (UKESS 15) to simulate the impact of tax incentives on individual work-related training expenditure.

The following three policies were modelled as indicative of the range of possible approaches. Policy 1 ('Deduction') is equivalent to allowing individuals to deduct work-related training costs from their total income for income tax purposes, and it is analogous to current policy towards companies and the self-employed. Policy 2 ('Flat 20') does not depend on the individual's income and is equivalent to a refundable tax credit at a flat 20% rate of the value of work-related training. Policy 3 ('Mix') allows individuals to benefit from the most advantageous of the 'Deduction' and 'Flat 20' policies based on their personal circumstances.

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<sup>1</sup> With the exception of the self-employed, who are taxed under a similar framework to that applying to companies.

## Model Output: Expenditure on Work-related Training by Individuals

It is estimated that each year individuals in the UK self-fund work-related training in the region of £1.25 billion, which is around £34 per eligible<sup>2</sup> individual. Given data limitations, this number should be treated as a best possible estimate of self-funded expenditure on training by individuals rather than a definitive statistic.

The amount of self-funded training varies significantly between groups. Individuals holding a degree or equivalent account for around 47% of total self-funded expenditure on work-related training, with those holding the equivalent of GCSE A\*-C grades and below accounting for approximately 17%. Degree-holders also spend the most on a per person basis – almost two times the equivalent figure for people whose highest qualification is GCE, A-levels or equivalent, more than three times the figure for those with GCSE A\*-C or equivalent, and a staggering 15 times more compared to people with no qualifications.

The short-term unemployed<sup>3</sup>, while only accounting for 8% of total spending (£104 million), spend almost three times as much on work-related training per person than employees, although the level of spending per person is much lower for the long-term unemployed.

## Model Output: Impact of Tax Incentive Policies and Cost to the Exchequer

**Table 1** Summary results - Central scenario (rounded)

	Annual private expenditure on training (£ million)	Change in total training expenditure compared to no incentives (£ million)	% Change in total training expenditure compared to no incentives	Annual Exchequer cost of tax incentive (£ million)	Net cost to the Exchequer (£ million)- Year 5 and onwards (steady state)
Policy 1:					
Deduction	£1,272	£28	2%	£87	£31
Policy 2:					
Flat 20	£1,355	£111	9%	£271	£241
Policy 3:					
Mix	£1,365	£122	10%	£309	£252

The table above shows model estimates under the central scenario with regards to the likely impact of each of the three modeled policies, as well as the cost to the Exchequer. Policy 1 ('Deduction') would increase total expenditure on training by individuals by 2%, at an initial annual cost to the Exchequer in terms of foregone revenues of around £87 million, falling to around £31 million at steady state (year five and beyond) once the

<sup>2</sup> Eligible individuals for the purposes of the policies examined include individuals aged between 16-69 who have completed full-time education, whether they are employed, unemployed or inactive. The group of eligible individuals excludes the self-employed.

<sup>3</sup> Those unemployed for less than a year.

increase in income tax payments by individuals who have undertaken training is taken into account<sup>4</sup>.

Policy 2 ('Flat 20') and Policy 3 ('Mix') are much more effective in increasing spending on training (by around 10% under the central scenario), but come at a higher cost to the Exchequer of around £250 million both in the short and the long run. The reason for this is that the 'Flat 20' and 'Mix' policies offer much more generous support than the 'Deduction' policy to individuals with relatively low incomes who pay little or no tax.

Notably, under the high response/high returns scenario (not shown in the table), the policies examined would generate a net *gain* to the Exchequer in the long run, as the additional income tax payments arising from the fact individuals benefit from higher wages following training more than offset the cost of tax incentives<sup>5</sup>.

The findings presented above relate to universal application of tax incentives, but it would also be possible to target tax incentives to specific groups. To give a few indicative examples, the 'Mix' policy would carry an Exchequer cost of under £40 million per year if solely targeted to people at GCSE grades A\*-C grades and those with no qualifications only. Restricting tax incentives to employees in the Construction, Agriculture, and Manufacturing sectors – three of the sectors exhibiting the highest skills shortages - would cost less than £20 million per annum.

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<sup>4</sup> In a nutshell, the cost to the Exchequer falls over time as the additional work-related training undertaken by individuals increases their productivity and wages, leading to higher income tax payments and hence reducing the effective cost of the tax incentives on training. Please note that the estimates of Net Cost to the Exchequer at steady state presented in this section do not take into account the likely increase in Corporation Tax payments due to the increase in worker productivity, and hence likely overestimate the steady-state Exchequer cost of the policies examined.

<sup>5</sup> It is important to highlight here that the high returns' scenario utilises values for the parameters of interest that are well within the estimates found in the academic literature, and also that our results do not take into account the likely increase in tax receipts from corporation tax, VAT, and other taxes flowing from increased worker productivity. As a result, the possibility of tax incentives actually generating a net gain to the Exchequer in the long run should be seen as a realistic, even if not the most likely, outcome.

## Recommendations

This report is a relatively high-level study of the feasibility of introducing tax incentives for individuals, and more work is needed to fully assess their likely impact and costs<sup>6</sup>, as well as to carefully examine policy design and delivery arrangements. That said, the evidence presented here supports the case that tax incentives for individuals merit careful consideration. Furthermore, in order to support wider policy aims on equity and equality of opportunity, tax incentives can be designed so as to also benefit low income individuals who pay little or no tax at the moment, for example via provision of a refundable tax credit.

The potential use of personal tax incentives to encourage individuals to invest in their work related skills could be trialled via specific groups. In this way potential implementation issues could be raised and addressed before any wider application of the approach. A staged roll-out of any such potential policy would also provide fertile ground for research and evaluation into the propensity of individuals to invest resources into their own personal and professional development. This report aims to make a useful and informed contribution to this debate.

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<sup>6</sup> The benefits of increased training to individuals, employers, and society as a whole potentially dwarf the cost to the Exchequer, and should be examined separately as part of a comprehensive Cost Benefit Analysis of introducing tax incentives. This report examines the *feasibility* rather than *desirability* of introducing tax incentives, hence the focus is mostly on the cost of tax incentives to the Exchequer rather than their wider benefits.

# 1 Introduction

Investment in work-related skills plays a key role in increasing productivity, and has a number of positive impacts on individuals, employers, and society as a whole. While most work-related training is funded by employers or the government, individuals also invest significant amounts directly.

A number of countries have introduced tax measures aimed at incentivizing investment in work-related training by individuals. The UK tax system only has limited provisions in this regard, and little is known regarding the cost, feasibility, and likely impact of such approaches. The aim of this study is to fill some of these knowledge gaps and to contribute to the policy debate.

The report proceeds as follows. Firstly, a thorough review of current policy in the UK and internationally is undertaken, followed by examination of the evidence around the likely impact of tax incentives on individuals' decision to invest in skills and the likely returns to work-related training. The study proceeds by documenting the key features of the model developed to assess the impact of different approaches to introducing tax incentives, and discusses the likely implications and feasibility of administering these within the current UK tax system.

The following section presents findings regarding the impact and implications different policy approaches would have on individuals' decisions to invest in skills, including an analysis by key subgroups of the population, e.g. the unemployed, low skill-individuals, and individuals in occupations facing intense skills shortages. The report concludes by providing recommendations on the way forward.

## **2 Review Section**

### **2.1 Current UK Tax Policy on Work-Related Training**

This section covers current UK policy affecting adult skills investment. The overall responsibility for skills in the UK is shared between the Department for Education (DfE) and the Department for Business, Innovation and Skills (BIS).

The majority of government policy on skills is currently not formulated as tax policy but rather as direct funding in various forms. These funding policies will be covered briefly, while the focus will be on the few tax based policies in the system, which include income tax and national insurance contributions (IT and NICs), corporate tax (CT) and value added tax (VAT).

#### **Tax Policy**

A handful of tax policies have been introduced over the years to help promote investment in skills. In broad terms, employers are allowed to deduct expenditure on work-related training for tax purposes, while self-funded training by individuals is generally not tax exempt. Before going into details about each policy, the structure of each tax covered is outlined below.

#### **CT, IT and NICs (Tax on Income) – Overview**

##### **Income Tax (IT)**

Income tax accounts for around a quarter<sup>7</sup> of total tax receipts. Taxable income includes earnings from employment, income from self-employment and unincorporated businesses, Jobseekers Allowance, retirement pensions, income from property, bank and building society interest, and dividends on shares. Most forms of benefits are not taxable. Income tax is charged on bands of income after taking into account personal allowances that depend on age and earnings.

The first £11,000 is the standard Personal Allowance, which is the amount of income you don't have to pay tax on. Taxable income between £11,000 and £43,000 is subject to the basic rate of 20%, while between £43,001 and £150,000 is subject to the higher rate of 40%, and the additional rate of 45% is payable on taxable income above £150,000. Savings and dividends are subject to slightly different tax rates.

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<sup>7</sup> OBR (2014). Economic and Fiscal Outlook. December.

## **National Insurance Contributions (NICs)**

National Insurance contributions are a tax on earnings, but their payments are supposed to entitle individuals to certain social security benefits. In practice, however, the link has weakened over time.

National Insurance contributions account for around one sixth of tax revenue. NICs are paid by employer and employees in relation to employee income subject to an earnings floor, which differs for employers and employees. The self-employed have slightly different rates and thresholds and generally pay less than employees and employers.

## **Corporation Tax**

Corporation tax is charged on the global profits of UK-resident companies, public corporations and unincorporated associations. Non-resident firms pay tax only on their UK profits. The tax is charged on income from trading, investment and capital gains, less various deductions (including training expenses). The corporation tax rate for company profits currently stands at 20%.

The following tax policies can be considered as promoting investment in skills.

## **Tax Exemption on Work-related Training**

Expenditure on work-related training for employees is a deductible expense for the purposes of determining corporation tax in the case of incorporated businesses and income tax in case of businesses run by self-employed people. The self-employed also get a relief on their own work-related training cost as long as the training is wholly and exclusively for the purposes of the trade.

The training has to be paid or reimbursed by the employer and does not cover any self-financed training by employees unless it occurs in the performance of their duties. The exemption also covers costs related to training like additional child care and travel and subsistence costs. The key word here is 'work-related', defined by HMRC as:

“any training course or other activity which is designed to impart, instil, improve or reinforce any knowledge, skills, or personal qualities which:

- are, or are likely to prove, useful to the employee when performing his/her duties or
- will qualify or better qualify the employee to undertake the employment, or to participate in charitable or voluntary activities arising through the employment.

The training must relate to the employee's current employment or to a related employment with the same employer”.

## **Tax Exemption on Retraining Expenses paid by Employer**

The cost of training to acquire new skills, therefore not work-related, can also be exempt from any tax in line with previous reliefs. This is however only applicable if the employee has just left or is about to leave his job. The idea is that the training might help the employee obtain further employment or become self-employed.

Under this relief the employee is not allowed to be re-employed within two years of leaving.

## **IT and NICs Exemption on Earnings of Full Time Students**

This policy excludes class 1 NICs and income tax on support payments to an employee who is studying full time<sup>8</sup>. This exemption does not cover pay for any actual hours worked. To qualify for this exemption the employee must be enrolled for at least one academic year and attend a course for at least 20 weeks in the academic year.

The payments are expected to cover lodging, subsistence and travelling allowances but not tuition fees. If the employer makes an award above an agreed annual limit, HMRC will review the payments in order to determine their true character as either earnings or scholarship income. Scholarships are not subject to tax<sup>9</sup>.

## **Employer NICs abolished for Apprentices Under 25**

In the 2014 Autumn Statement the Government introduced a new tax exemption. From April 2016 Employer NICs liabilities on earnings up to the upper limited are abolished for apprentices under the age of 25. The Government estimates that the cost will be around £100m in 2016-17.<sup>10</sup>

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<sup>8</sup> At a university, college or school or other similar educational establishment that offers more than one course of practical or academic instructions.

<sup>9</sup> Income from a scholarship is exempt from income tax and disregarded for all income tax purposes if the holder of the scholarship is receiving full-time instruction at a university, college, school or other educational establishment.

<sup>10</sup> Autumn Statement 2014 – Policy Costings.

## **Indirect Taxes - VAT**

VAT is a proportional tax paid on all sales and accounts for a similar share of tax receipts as NICs. The standard rate of VAT is 20%. A number of goods are subject to reduced rates, are zero-rated or exempt. Zero-rated goods have no VAT levied upon the final good, and firms can reclaim any VAT paid on inputs. With exempt goods, like private education (see below), firms cannot reclaim VAT paid on inputs.

### **VAT Exemption for Private Tuition and Tutorial Colleges**

In line with other OECD countries, privately provided education is normally exempt from VAT. In the UK, private educators are exempt from VAT as long as the subject is ordinarily<sup>11</sup> taught in a school or university. This excludes motorcycle and car driving instructions.

### **Tax Credit**

There are two types of tax credits available for families in the UK: the Child Tax Credit and Working Tax Credit. Only the Child Tax Credit has an element linked to education.

Child Tax Credit (CTC) is a means-tested support for families with children. Families are eligible if they have at least one child aged under 16, or aged 16–19 and in full-time non-advanced education or approved training. CTC is built up from a number of different elements. Firstly there is a so-called family element of £545 per year. Secondly, child elements of £2,780 per child per year, and on top of that a disability element of £3,140 per child per year and furthermore a severe disability element worth £1,275 per child per year in addition to the previous two.

In the financial year 2012-13 over 4 million families with children received CTC payments. The total amount of CTC awarded that year was just under £21 billion.<sup>12</sup> As CTC is available for families with children aged 16-19 in full time education it can be regarded as encouraging investment in skills and falls in the category of tax based policies. According to HMRC, around 50,000 families receive tax credit only because of a child in full time education; the latest annual estimate (2014-15) for annual awards is around £200 million.

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<sup>11</sup> Taught in a number of schools or universities on a regular basis.

<sup>12</sup> HMRC Statistics.

## Costings

Unfortunately there is limited evidence available on the cost to the Exchequer on the various tax reliefs and exemptions listed in this section since neither self-employed individuals nor employers are required to report these amounts separately to HMRC. Despite these shortcomings some attempts have been made to estimate the cost.

A report from the Independent Inquiry into the Future of Life Long Learning (IFLL) sponsored by NIACE (the National Institute of Adult Continuing Education) and published in 2009 estimated the cost of tax relief to income to be £3.7 billion.<sup>13</sup> These figures were updated in 2011 using similar methods and the cost was found to be around £4.9 billion in the tax year 2009-10, around £3.4 billion of which related to corporate tax and £1.5 billion to income tax.<sup>14</sup> Taking into account inflation since 2009-10<sup>15</sup> would bring this figure to around £5.5 billion in today's prices. These numbers only include the main tax relief impacting CT and IT payments.

The Institute for Fiscal Studies (IFS) has estimated the cost of various VAT exemptions for the tax year 2011-12.<sup>16</sup> This includes the exemption of private education which the IFS estimate costs around £2.4 billion, which translates to around £2.5 billion today once inflation in the intervening period is taken into account. The latest data from HMRC suggest that the cost of tax credits related to full time education is around £200 million.

The chart below shows the breakdown of the above estimates of the direct cost to the taxpayer of the various tax policies related to investment in skills, together amounting to about £8.3 billion in 2014 prices.

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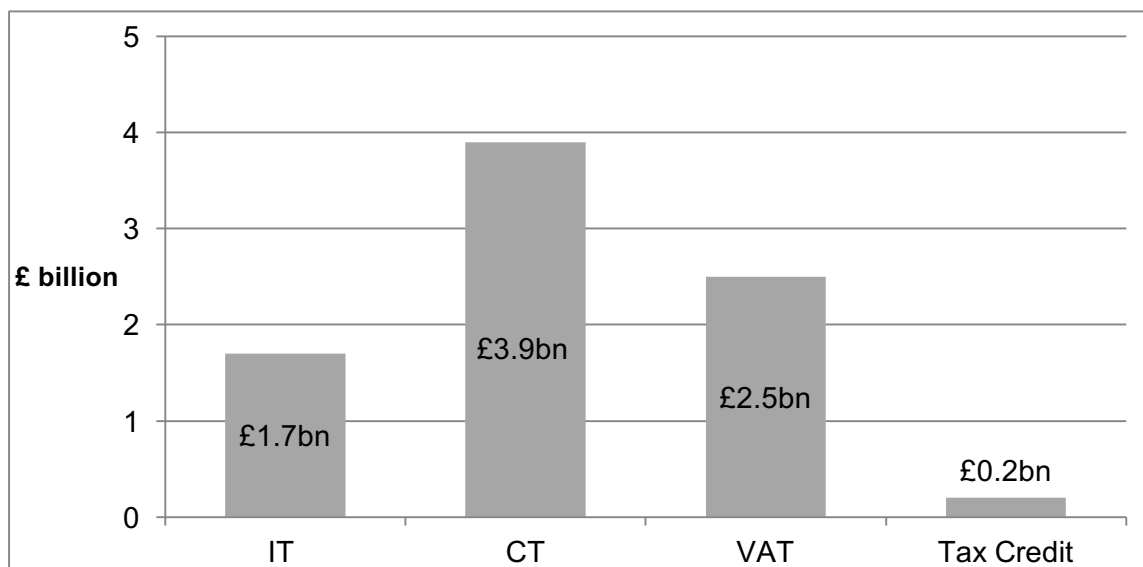
<sup>13</sup> Schuller and Watson (2009). Their calculations are based on training expenditure data from the UK Commission's Employer Skills Survey (UKESS) and BIS data on enterprise numbers to arrive at the total training expenditure which could be subject to tax relief. The estimates require, among other things, assumptions about the number of companies with 0 to 1 employees not included in the UKESS and their training expenses. These figures are highly uncertain and are based on a limited evidence base.

<sup>14</sup> Unionlearn (2011). Tax relief on training.

<sup>15</sup> Correcting for inflation using the change in CPI from 2009-10 (using average index) to 2014.

<sup>16</sup> IFS (2012) A survey of the UK tax system

**Figure 1 Cost of tax policy (£ billion)**



Source: IFS, IFLL, HMRC

## Other Funding Policies

### Student Loans

Student loans are not strictly a tax benefit, but the government's support to students via student loans is worth highlighting. In the financial year 2013-14 around 1 million students in England received some type of student funding from the government in the form of a loan for tuition and/or living costs. The cost to the Exchequer was around £11 billion.<sup>17</sup> Since these are loans and not grants the total amount is not 'lost' to the Exchequer. The IFS has estimated that for each £1 lent by the government around 43p<sup>18</sup> will be lost, and is therefore a form of subsidy to encourage higher education. Using the IFS estimate in 2013-14 the cost to the taxpayer was just under £5 billion for students in England.

In the 2014 Autumn Statement the government also introduced student loans for postgraduate students from 2016-17 onwards for those under 30 up to a maximum amount of £10,000. The estimated take up is around 47,000 students in 2016-17 with a cost to the Exchequer of around £300 million, going up to around £400 million in the following years. As mentioned above these are loans and not grants and therefore only a part of the cost can be considered a form of subsidy.<sup>19</sup>

<sup>17</sup> [www.slc.co.uk/official-statistics/full-catalogue-of-official-statistics/student-support-for-higher-education-in-england.aspx](http://www.slc.co.uk/official-statistics/full-catalogue-of-official-statistics/student-support-for-higher-education-in-england.aspx)

<sup>18</sup> Crawford, Crawford and Jin (2014). Estimating the Public Cost of Student Loans. Institute of Fiscal Studies. IFS Report R94.

<sup>19</sup> Autumn Statement 2014 – Policy Costings.

## Adult Skills Budget and More

Direct government funding towards adult FE and skills, administered mostly by BIS and the Skills Funding Agency, was around £4.1 billion for 2014-15 as shown in the table below, and predicted at the 2014 Skills Funding Statement covering 2013-16 to drop to just under £4 billion in 2015-16.<sup>20</sup> The government has stated its aim of streamlining the funding system for adult skills with the principles of

“employer ownership and enterprise, ensuring funding follows learners and encourages colleges to be social enterprises, not delivery arms of Government.” (BIS and the Skills Funding Agency, 2014).

**Table 2 Government funding**

	<b>Baseline 2013-14 (£m)</b>	<b>Funding 2014-15 (£m)</b>	<b>Indicative funding 2015-16 (£m)</b>
Adult Skills Budget	2,467	2,258	2,218
Employer Ownership	46		73
24+ Advanced Learning Loans	129	398	498
Offender Learning and Skills Services	130	129	129
Community Learning	211	211	211
European Social Fund	171	173	170
<b>Total: Teaching and Learning</b>	<b>3,155</b>	<b>3,242</b>	<b>3,085</b>
Learner Support	177	206	174
National Career Service	88	91	91
<b>Total: Student/Learner</b>	<b>265</b>	<b>296</b>	<b>265</b>
Skills Infrastructure	55	59	24
Funding to Support FE and Skills Sector	157	125	82
Capital Grants	450	415	410
<b>Grand Total</b>	<b>4,081</b>	<b>4,138</b>	<b>3,866</b>

*Source: BIS and the Skills Funding Agency (2014) Skills Funding Statement.*

The largest part of the budget, the Adult Skills Budget, supports both workplace and classroom learning to help provide

<sup>20</sup> BIS and the Skills Funding Agency (2014). Skills Funding Statement. February.

“Traineeship to improve young people’s chances of gaining sustainable employment; Apprenticeships as a core offer to all young adults; English and maths for those who need them; and provision for all learners to increase their skills, competence and knowledge.”

The budget fully funds various traineeship programmes for young people aged 16 to 24 as well as English and maths qualifications for learners aged 19 and over. It also fully funds other types of qualifications at level 1 and above for the same age group. The budget also partly funds various apprenticeship programmes and qualifications for those who do not qualify for full funding.

The second largest part of the budget, apart from capital grants, is the 24+ Advanced Learning loans available for those aged 24 and over studying at level 3 and 4.

**Box 1            Individual learning accounts**

The Government introduced Individual Learning Accounts in England in 2000 with the aim of widening participation in learning by helping to overcome financial barriers faced by individuals. Accounts were to be available to everyone, including the self-employed, and were to be used to help pay for learning of the learner's choice. The Government was keen to use the accounts to target people with particular learning needs; for example, young people without qualifications and in low skill jobs, employees in small firms and those seeking to return to work.

The scheme was successful in attracting over one million people back into learning. However, in November 2001 the Government withdrew it following allegations of fraud and abuse. An audit by the NAO published in 2002 reported that it was poor planning, risk management, and lack of quality assurance that caused that breakdown and not the idea behind the scheme itself.

“In some respects, this was a very good and innovative scheme: it was popular and encouraged many people to acquire or update much needed skills. But the speed with which the Department implemented the scheme resulted in corners being cut. Poor planning and risk management by the Department led to weaknesses in the system which made fraudulent activities possible. And the Department did not keep their eye on the quality of the learning and on the indications that a few unscrupulous providers

were taking advantage of the inadequate security arrangements.”

A similar scheme under the same name was introduced in Scotland in 2004 with more success.

In Scotland people can apply for an ILA if they: are not undertaking any secondary, further or higher education; do not have a degree or above; are not training through the Employability Fund or Modern Apprenticeships, or participating in the Community Jobs Scotland programme; and have an income of £22,000 a year or less or are on benefits. People can get up to £200 towards to cost of training and learning.

In the financial year 2013-14 over 51,000 accounts were opened and just fewer than 51,000 bookings were made by learners. There were just over 500 providers registered. An evaluation of the policy was undertaken in 2007 which showed that it was a welcome scheme but unlikely to be successful on a stand-alone basis.

“The ILA Scotland scheme has been generally welcomed by both learning providers and intermediaries. It is seen as a valuable additional form of support, particularly for those on low incomes, lower skilled and unemployed. It can also be used by those working with vulnerable groups to provide support and encouragement when rebuilding their lives. However, it cannot be seen as a stand-alone initiative. ILAs in themselves will not provide the incentives for the key target groups to re-enter education or training. Many people need encouragement to take steps into learning, and develop what have been described as ‘learning attitudes’. This points to the importance of partnerships with other agencies in developing the potential of the ILA Scotland scheme.”

A survey was conducted in 2008 suggesting that the scheme was successful in encouraging learning.

“In assessing the role of the ILA scheme in encouraging participation, it is also important to examine whether the funding was responsible for people taking up courses or whether they would have done so anyway even if the ILA funding was not available. A proportion (16% on ILA200 and 27% on ILA100) said they would have been “very likely” to have done the course anyway, but the majority felt that the funding did make a difference to their participation.”

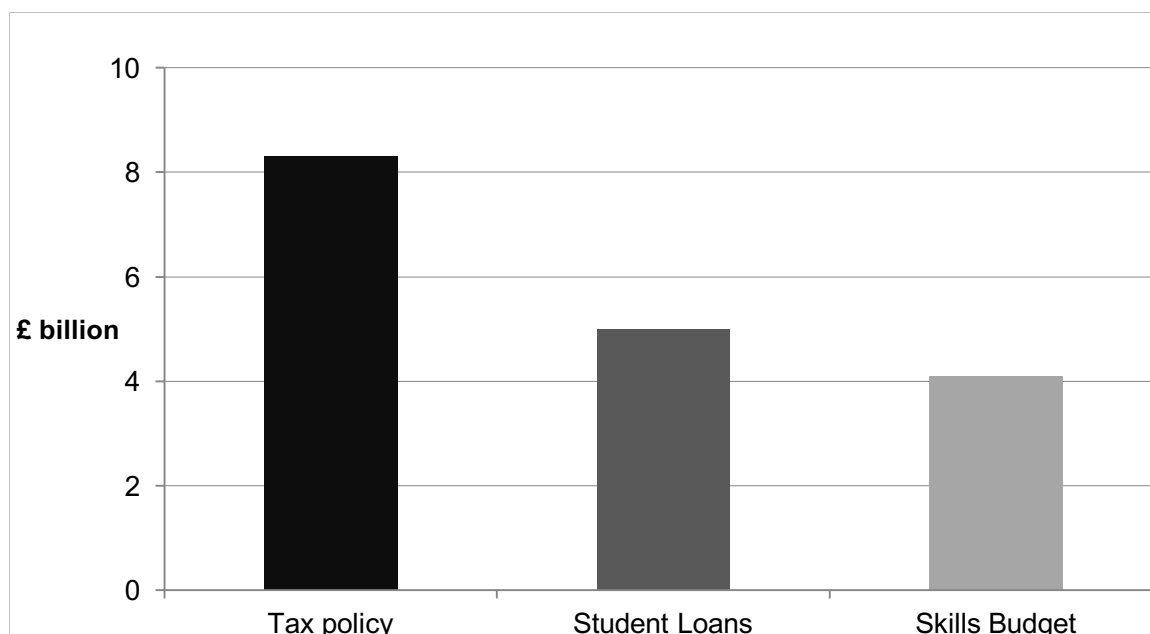
In 2015, BIS and the Skills Funding Agency published a letter stating the government’s commitment to make available £1.5bn in grant funding to support the costs of apprenticeship training for adults and another £1.5bn for further adult education outside of the costs of apprenticeship training for 2016-2017. This second figure forms a new budget which is called the Adult Education Budget (AEB). The new AEB is a single funding line which replaces what had been three separate funding lines: funding for adult further education outside of apprenticeships (previously held within the adult skills budget); Community Learning; and Discretionary Learner Support. From 2017-2018, the new apprenticeship levy will provide new funding to support apprenticeship training, bringing the total investment in adult apprenticeships to £1.485bn by 2019-2020.<sup>21</sup>

### Investment in Skills – Cost to the Exchequer

Pulling together all the different elements that help support adult investment in skills gives an estimate of the total cost to the Exchequer per year. The cost of student loans is assumed to be around £5 billion and the adult skills budget is around £4.1 billion. The tax policy costing is a combined estimate using figures from earlier years upgraded using CPI.

The combined annual cost is estimated at around £17.4 billion, bearing in mind the uncertainty with regards to the tax policy costings.

**Figure 2 Total cost to the Exchequer (2014 prices)**



<sup>21</sup> BIS and the Skills Funding Agency (2015). Skills Funding Letter 2016 - 2017

## **2.2 Incentive Effects of Current UK Policy**

Taxes are inevitable given the need to finance government expenditure. In almost all cases, however, taxation creates distortions - for example a wedge between what consumers pay and producers get for a product, and what an employee gets and an employer pays for work. As a result, taxes have a general 'disincentive' effect on all economic activity they apply to.

A key aim of a good tax system is to minimise these disincentive effects, and in particular to make sure that – to the extent possible - the tax system does not favour one good or activity, for example a product or a type of investment, over another. In relation to education and training this could mean ensuring that the marginal tax rate on returns to investments in physical capital is similar to the marginal tax rate on returns to investing in human capital, or that the tax system treats training provided by employers in a similar way to training funded by individuals.

### **Key Distortions**

Only a flat income tax would avoid deterring work-related training by individuals, as long as the direct costs of training are fully subsidised or deductible from tax (at the same rate). Under these conditions, the direct cost and the opportunity cost (foregone earnings) are taxed at the same rate as the benefits (additional future earnings). In the UK, as in most other European countries, the marginal tax rate on labour income goes up with income – i.e. income tax is progressive - and therefore the benefits of undergoing work-related training (higher income) are taxed at a higher rate and hence discouraged by the system (Heckman and Jacobs, 2010).

The impact is even larger if the direct cost is not deductible from income tax. In the UK, employer funded training is treated as a business expense and deductible from tax on profit, while work-related training funded by individuals is not. This characteristic of the system potentially favours firm-specific training rather than general skills training. Directly funding or subsidising work-related training (e.g. via tax incentives) can go some way towards correcting this distortion.

As in the UK, most tax systems seem to favour investment in physical capital over human capital, with lower tax rates on capital gains compared to tax rates on earnings. Again, direct government funding or subsidies towards human capital investment can help correct the imbalances caused by the system.

## **Other Factors to Consider**

The tax system is not deliberately designed to distort work-related training by individuals; the distortions are influenced by other factors. Capital, for example, tends to be more mobile than workers and subject to more intense international tax competition leading to overall lower tax rates. The progressivity of the income tax system on the other hand is important for redistribution and equity reasons.

It is hard to give a simple answer to the question of whether the current tax system especially disincentives work-related training for individuals. Any tax system will always create distortions and whether these are problematic depends on the reference point - for example, how the tax system treats investment in work-related training by individuals compared to other types of investments. The impact of the tax system also depends on other government policies, especially educational spending policy and the benefits system, which further complicate matters.

In addition, the government has to balance the aim of limiting distortions with other considerations, such as equity and externalities. Equity is an important aim for any government and an attempt to correct distortions, for example by introducing a blanket tax exemption on all training, could increase inequality as higher income people are more likely to train and may enjoy higher returns (Carneiro and Heckman, 2003). The trade-off between equity and efficiency is something governments constantly have to deal with when setting policy and there is no 'right answer' to how much relative weight should be placed on each objective.

Furthermore, the government needs to take into account that work-related skills can have wider benefits – what economists call 'positive externalities'. Those who are more educated are generally more productive and may enhance the productivity of others, are better at adopting new technology and creating new knowledge, less likely to need government support and often have higher earnings and therefore pay higher taxes (OECD, 2011).

In conclusion, it is difficult to provide a straightforward answer to the question of whether the current tax system incentivises or disincentivises work-related training by individuals. Given the need for taxes to fund public goods<sup>22</sup>, disincentive effects are to some extent inevitable, and the more relevant question is whether the tax system introduces a negative bias to such spending relative to related activities - notably investments in physical capital and investments in work-related training by employers. The answer to both seems to be yes, and although in the case of investment in human capital there are good practical reasons for doing so, there is no good *economic* reason why investments in work-related training should be treated differently for tax purposes based on whether they are funded by employers or by individuals.

Finally, while the discussion above is important from the point of view of overall tax system design, from a practical policy perspective what matters most is not so much the absolute effect of the tax system on (dis)incentivising investments on work-related training by individuals, but rather how any proposed policies alter the overall picture relative to the status quo – an issue covered in detail at the ‘model output’ section of this report.

### **2.3 Current Policy in selected OECD and EU countries**

Most advanced economies use tax policy to varying degrees to support investment in skills. In 2011, a survey of 31 OECD countries, India and South Africa (Torres, 2012) found all the countries to have some type of targeted tax measures related to education and training. The measures vary between countries in design and generosity as well as the type of tax they apply to. There is also variation in what type of education is included; most countries have some type of favourable tax treatment for the cost of adult training while some also include formal education.

#### **Personal and Corporate Tax**

Most of the countries surveyed have some type of personal tax exemption for the cost of skills investment while the few countries that have no such policy are generally those where the costs of education and training are typically covered by public funding, e.g. the Nordic countries.

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<sup>22</sup> The term ‘public goods’ is used in a general sense, to include not just tangible goods such as infrastructure, but also the welfare state, public provision of health and education, correction of negative externalities, etc.

Some countries only allow personal tax exemption on work-related training (see table below) while others allow personal tax exemption for other types of training and/or an exemption on the cost of a child's education and post-secondary education. In Austria, for example, education and training is exempt if it is to prepare for a change in occupation or to improve skills in current employment. In Australia there is a tax allowance for up to 50% of education expenses (there is a cap) of a child in primary or secondary school as long as parents are eligible for certain government benefits. In Mexico the tax allowance is for the expenses of a taxpayer's education as well as those of his/her child, parent or spouse. This only applies for education between pre-primary and upper secondary, and there is a cap on the allowance depending on educational level.

**Table 3 OECD countries India and South Africa surveyed in 2011 (focus on adult education excluding measures related to dependants' education)**

Country	Income tax exemption/ credit	Cap	Re-fundable	Other restrictions	Work-related training only
Australia	X				X
Austria	X				X (training to prepare for change in occupation also allowed)
Belgium	X				X
Canada	X				
Canada (2)	X	Only on transfers to relatives and for textbooks	No but can transfer between years or to a relative (cap)	Tax credit (15%)	
Chile					
Czech Republic	X	X (fixed amount)	X	Only aged 26 and under pursuing an academic training programme (or under 28 for PhD)	
Denmark	X			Must maintain or update professional training	
Estonia	X	X		Only aged 26 and under at accepted educational institutions, can also be reclaimed by parent, grandparent or sibling of student	

Country	Income tax exemption/ credit	Cap	Re-fundable	Other restrictions	Work-related training only
Finland	X				X
Germany	X	X (only for initial non-employment related training)			
Greece					
Hungary					
India	X	X			
Ireland	X	X		Only tuition fees paid approved 3 <sup>rd</sup> level courses or approved foreign language or IT training courses. The claim is reduced by any scholarships, grants or employer contribution or other sources	
Israel	X				X (maintain current professional knowledge level)
Italy	X	X (only for private and foreign institutions)		19% tax credit. Only courses at secondary education level or higher. Also includes rental expenses if studying away from place of residence	

Country	Income tax exemption/ credit	Cap	Re-fundable	Other restrictions	Work-related training only
Japan					
Luxembourg	X				X
Mexico	X	X		Only educational level between pre-primary and upper secondary	
Netherlands	X	X			
New Zealand					
Norway	X			Adult training beyond basic formal education	
Poland					
Portugal	X	X		Expenses above cap eligible for 30% tax credit up to another cap	
Slovak Rep.					
Slovenia					
South Africa					
Spain	X				X
Sweden					
Switzerland	X				X
Turkey	X	X			
US (1)	X				X
US (2)	X	X	Partly	20% tax credit of the first USD 10,000	

Of the 33 countries surveyed, 26 had some type of personal income tax and/or social security exemptions for income from scholarships, grants, various academic awards and bursaries. A few of the countries also have targeted tax relief for debt and savings used to finance investment in skills. The personal tax relief is on the interest on student debt or, in the case of savings, on investment income from savings earmarked for education costs. In Canada and the US there are exemptions from tax on early retirement withdrawals if these are used for educational expenses.

When it comes to corporate tax, the tax treatment is quite similar across the OECD countries. In all of the countries surveyed, except Luxembourg, training expenditure is deductible from business income at the year they are incurred. In the majority of the countries examined, including in the UK, deduction is only allowed for training related to the business activity of the firm, while some countries allow other types of training to also be exempt from tax. Some of the countries use the corporate tax regime to directly stimulate employer-provided training e.g. with tax credits against corporate income tax for employers offering apprenticeships.

### **Value Added and General Sales Tax**

As is the case in the UK, most OECD countries have a tax exemption for educational services (apart from New Zealand and Turkey where the rate is only reduced for most services). This normally only applies to recognised educational entities. Goods and services related to education and training are also exempt in most cases. Most of the countries have a policy of tax exemption, while Australia applies a zero rate to accredited educational courses and associated supplies.

### **Related Policies**

A number of countries offer tax concessions with the aim of attracting mobile, highly skilled workers - an example being Denmark, which offers foreign researchers a reduced personal income tax rate. To give another example, Israel offers a non-refundable tax credit for the completion of tertiary education degrees or for obtaining certain professional certifications.

In addition to the UK, only Australia and New Zealand offer student loans (which are income-contingent) towards financing individuals' post-secondary education.

Five of the surveyed countries in the OECD study have tax-related schemes that mandate a certain minimum amount of employee training. In Belgium, for example, employers investing less than 0.1% of total wage costs to training are subject to an additional social security contribution of 0.05% of gross wages.

### **2.3.1 Evaluation Evidence on Tax Incentives in Selected OECD and EU Countries**

In general, foregone tax revenues due to tax policies aimed at promoting investment in skills are only a very small portion of total expenditure on education and training. Data from 2003 show the cost ranging from 0.5% in Austria to 3% in the Netherlands (OECD, 2004). With this in mind, it is perhaps not surprising to see that there is limited evidence on the economic impact of tax policies aimed at promoting investment in skills. This section briefly touches on the few studies available.

Turner (2011) looked at the impact of a number of tax reliefs and allowances in the US aimed at promoting college enrolment in the US, and found that they increased full time enrolment by those aged 18 and 19 by 7% in the first two years. In another study focussing on the same measures, Lalumia (2010) found the measures increased the probability of enrolment for those aged 33 to 41 with unmet educational attainment expectations.

In a follow-up study, Turner (2012) found that around 80% of the tax relief ended up benefitting educational institutions, as they reacted to the measures by reducing available grants aid. Long (2003) also found the tax credits led to faster tuition fee growth. The results show that the response of educational institutions is crucial when it comes to understanding the overall impact of tax measures.

In 1998 the Netherlands introduced a number of tax incentives for employer provided training, including an additional tax deduction for training by individuals aged over 40. Leuven and Oosterbeek (2004) found the policy did not stimulate additional training but merely postponed it as people in the relevant age range delayed their training plans to take advantage of the tax deduction.

A comprehensive report published by the European Commission in 2009<sup>23</sup> looked in detail at tax policy aimed at stimulating investment in education and training in selected EU countries. The report highlights the lack of empirical evidence on policy impact and the fact that tax incentives are often criticised for their high deadweight cost, especially among larger businesses, but goes on to emphasise that they are appreciated by employers and employees. The conclusion of the report is that tax incentives should be considered as a supplementary rather than a main policy tool and should be used in conjunction with other policy levers to promote investment in skills.

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<sup>23</sup> CEDEFOP (2009). Using Tax Incentives to Promote Education and Training.

One example of a policy that reflects these issues is the so called ‘payment reduction for education’ incentive introduced in the Netherlands in 1999<sup>24</sup>. This policy worked as a tax credit which allowed the employer to deduct a certain amount from income tax payments, as a lump sum, for each employee in education financed by the employer. According to experts interviewed for the EU report, businesses valued this policy and some estimates suggested take-up was up to 80%, although no detailed evaluation is available. At the same time, there were widespread concerns that smaller businesses often weren’t aware of the policy or didn’t have a high enough tax bill to benefit, while in many cases larger companies benefitted from a reduction in their tax bill without providing significantly more training than they would have done in the absence of the policy.

Findings from studies looking at the effect of non-tax financial incentives can also be instructive. In 2006, the UK government introduced ‘Train to Gain’, a new policy aimed at supporting training by lower skilled workers. The government offered free training for employees as well as financial compensation for training during working hours, while employers with fewer than 50 employees also received compensation for hours spent off work. In 2010-11, the cost of the scheme was estimated at around £1 billion.

An evaluation by the Institute for Fiscal Studies (IFS) found the policy did not have a significant impact on training in the first 3 years of the scheme (Abramovsky et al, 2011). The authors speculate that, since recruitment of employers was often through training providers, they might have approached their usual clients first before reaching out to others – and as a result some of the new training under the scheme might have simply replaced training that would have taken place regardless. In addition, the amount of funding was capped, which might have further limited the impact of the policy.

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<sup>24</sup> Abolished in 2014.

## 2.4 Review of the Academic Literature

### 2.4.1 Response of the Demand for Investment in Skills to Price (including Tax Incentives)

The tax treatment of investment in skills impacts on the price faced by individuals and companies for training, and hence on the amount of training procured. The literature on the specific effects of tax incentives is very limited; however there is a much more developed literature looking at the price elasticity of demand for training more generally, including via the use of alternative policy tools (e.g. vouchers). Since the effect on training decisions operates via the same channel whether the price drop is related to the tax treatment of training or through other channels, this literature is also reviewed to understand the effect on individuals' decision to invest in training, and how different groups are likely to be affected. There is also a considerable body of knowledge relating to the price elasticity of other types of education, like university education.

It is important to bear in mind that price elasticity of demand is not the same as incidence. For example, a large number of studies find that men are more likely to participate in training than women, and that higher income/higher skill individuals are more likely to participate in training than lower income/lower skill individuals. This, however, says nothing about whether a decrease in price (e.g. via a tax incentive) would affect a particular group more – for example, there are some studies that show that while high income individuals undertake more training, a price decrease has a much more pronounced effect on the participation of low income individuals.

A study by Leuven and Oosterbeek (2007) is one of the few that analyses the impact of tax policy on investment in skills. They evaluate the deductibility of direct training expenditures from taxable income in two different ways: by exploiting the differences in deductibility rates around kinks in the tax schedule, and by taking advantage of tax reforms introduced in 2001 which impacted the returns to training (opportunity cost) in 2000 and 2001. Results based on the former approach indicate that a 10 percentage point increase in the tax deductibility rate of direct training expenditures increase training by 0.33 percentage points (which is a 10 per cent increase of the training rate, implying a PED<sup>25</sup> of -1). The second approach, which deals with the opportunity cost of training, suggest that a 10 percentage point increase in the tax deductibility rate of training leads to increased participation of 0.8 percentage points, or a 25 per cent increase in the training rate. This suggests a PED of -2.5.

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<sup>25</sup> Price Elasticity of Demand (PED) is defined as the percentage increase in quantity demanded following a 1% increase in price.

Messer and Wolter (2009) conducted a randomized experiment analysing the impact of vouchers for adult training in Switzerland. They found that the vouchers had a positive impact on training, varying significantly by level of education. Although the vouchers were used more by those with higher educational attainment, most of them would have undertaken training regardless. On the other hand, individuals who had only completed compulsory education exhibited a low take up rate, but around two thirds of the vouchers were used to finance training that would not have taken place in the absence of the scheme. Schwerdt, Messer, Woessmann and Wolter (2012) offer a further analysis of the experiment which is somewhat more sceptical of its impact.

Another randomized experiment, initiated by the Dutch government and evaluated by Hidalko et al (2011), involved over 600 low-skilled workers in the Netherlands being given a training voucher of €1,000 each. The vouchers were found to increase participation, with the effect being especially pronounced in the case of men and those working shorter hours.

Although not directly linked to work-related training, it is instructive to also look at studies of price sensitivity to university education for comparison. A study by Turner (2011) is especially interesting as it looks at how tax based federal aid in the US impacted college enrolment. He found the favourable tax treatment increased enrolments in the first two years of college for those aged 18 to 19 by 7 per cent. This implies an increase of around 0.3 percentage points for each \$100 of tax based aid. Furthermore, Leslie and Brinkman (1987) conducted a review study looking at around thirty studies which analyse the price sensitivity to college enrolment. For national studies, including private and public schools, the price elasticity was found to hover around -0.6 to -0.8.

Further studies look specifically on how different groups are affected. Many of those show that lower skilled workers and/or those with lower educational attainment are more likely to respond to financial incentives, perhaps because they are credit constrained. Many of the studies focus directly on the issue of credit constrains. Bassanini and Ok (2003) looked at employer-sponsored continuous vocational training (CVT). They made use of survey data that contains information on courses that workers would have liked to have taken but could not afford, i.e. instances where individuals were credit constrained. The probability of being constrained for financial reasons was the lowest for managers and the highest for those in elementary occupations. The probability of being credit constrained was also higher for women, compared to men, and the highest for women working part time for family reasons.

Chapman et.al. (2003) looked at whether self-financed training after job loss by employees in Canada was subject to credit constraints. They found those with available savings, or cash-in-hand, to be twice as likely to undertake training, while no similar effect was observed for training paid for by others suggesting that credit constraints played a role.

## **2.4.2 Returns to Investment in Skills**

### **Returns to Employees**

Compared to the literature on the price elasticity of demand discussed in the previous section, the literature on the returns to work-related training is much richer – however, it tends to suffer from various methodological issues giving rise to widely varying estimates. The key issue faced by researchers is that individuals who undertake training are often more motivated and have higher innate ability than individuals who don't, making it difficult to determine the extent to which the higher wages they enjoy can be attributed to training. More recent studies that attempt to control for motivation and ability tend to find much smaller returns to training compared to older papers that do not always adequately address the issue.

Furthermore, while in some papers returns are shown to differ by sex, age and level of skills, few of these findings are replicated consistently throughout the literature - some studies, for example, show women enjoying higher returns than men, while other studies argue the opposite is true.

Booth (1991), using data from the 1987 British Social Attitudes Survey, finds returns of 11.2 per cent for men and 18.1 per cent for women. The study does not correct for the potential selectivity issue discussed above. Blundell et.al (1996) attempt to correct for this bias on data from the National Child Development Survey. They find returns to on-the-job training to be 3.6 per cent for men but they find no significant impact on women's wages. With regards to off-the-job training the returns are higher: 7 per cent for men and 5 per cent for women. Furthermore, Blundell et.al (1999) use three different methods to estimate returns on employer provided training courses. The method that does not attempt to correct for the selectivity issues/bias results to the highest estimate (8.3 per cent for men) while the other methods lead to estimates of 6.5 and 5 per cent. The returns for women are found to be lower but still significant.

In a more recent study, Almeida (2010) uses the British household panel data from 1991 to 2005 to estimate the wage returns to training. Correcting for individual as well as workplace characteristics the returns to training are estimated to be less than 1 per cent. Returns are found to be higher for older white collar workers while there is no evidence that older blue collar workers benefit from higher wages.

Bassanini et.al (2005) estimate the cross country returns to training in selected European countries, including the UK, using the European Community Household Panel dataset. They use two different methods, one of which attempts to correct for the selectivity bias. The estimates range from 4 to 22 per cent based on the 'uncorrected' method and 0 to 11 per cent based on the 'corrected' one. A more recent study by Albert et.al (2010) also looks at the returns to training in Europe using the same dataset. A simple estimate without any corrections yields a return of around 10 per cent in most cases, although after correcting for selectivity bias the estimates - with the expectation of Italy - are not significantly different from zero.

Leuven and Oosterbeek (2008) attempt to correct for the selection bias by narrowing down the comparison group to those non-participants in training that did not participate due to some random event. In their study the estimate of returns goes from 9.5 per cent to 1 per cent when the restricted comparison group is used.

A meta-analysis of 71 studies published between 1981 and 2010 by Haelermans and Borghans (2011) finds on average very high returns to training of around 30 per cent. However, the results are shown to be very sensitive to the choice of models and methods in line with the studies discussed above. Studies that correct for selectivity bias show substantially lower returns.

Finally, when looking at returns to training it is important to consider that skills may 'depreciate' over time in the absence of follow-up training. Given the methodological difficulties involved – i.e. the need for a dataset that tracks training participants and an appropriate comparison group over a long time period – there are few attempts to arrive at a precise estimate of this 'depreciation rate', with Bartel (2000) suggesting that reasonable estimates could lie between three and twenty per cent per year.

## **Returns to Employers**

The returns to employers will differ from the returns to employees and depend on the effects of training on productivity and wages. The idea is that, while training improves the productivity of participants, this is only partially reflected on increased wages. For example, if due to training an employee can now produce an additional £10 worth of goods each day, the employee may only see a higher wage of £5 per day, with the residual increase in productivity reflected in the profits enjoyed by the employer.

Due to methodological challenges with measuring productivity, there are only a few studies that look at the impact of work-related training on wider productivity or employer profits (rather than just employee wages). Dearden et.al (2005) analyse a panel of British industries from 1983 to 1996. They find that raising the proportion of workers trained in an industry by 1 percentage point is associated with a 0.6 per cent increase in value added per worker and 0.3 per cent increase in wages. In other words, they find that the magnitude of the impact on wages is only the half as large as the impact on productivity.

Barrett and O'Connell (2001) analyse a sample of Irish firms. They find that training that provides broad skills and knowledge had a positive impact on sales growth. They find that increasing the number of training days per employee by 1 per cent increases productivity by 3 per cent. Brunello (2004) on the other hand analyses survey data from 97 large Italian companies. A 10 per cent increase in the average numbers of hours of training per head is found to increase productivity by 1.3 per cent. More recently Almeida and Carneiro (2008) estimate the returns for large Portuguese companies; they find returns of 8.6 per cent for those providing training.

### 3 The Model

For the purposes of this study, a detailed model was developed aiming to provide a simulation of changes in the amount of training purchased by individuals following the introduction of tax incentives, and based on this the cost to the Exchequer in the short and long run. This micro-simulation approach has two important advantages. Firstly, individuals are expected to respond in different ways to the same policy based on their characteristics and the characteristics of the policy. Secondly, by estimating the impact of tax incentives at the individual level, it is possible to 'aggregate up' to arrive at the total impact on training expenditure, cost to the Exchequer, and other variables of interest for any population group of interest.

In simple terms, the model works in two stages. During the first stage, individuals react to the tax incentive and decide how much training to undertake. Tax incentives work similarly to a discount in the price of training, with the level of that discount depending on the specific characteristics of the tax incentive policy utilised and (possibly) on individual characteristics, such as the individual's income and the marginal tax rate she faces. In addition, individuals with different characteristics would be expected to have a different response to the introduction of tax incentives, even in cases where the level of the effective discount is the same: for example, low income individuals tend to be much more price sensitive than high income individuals. The assumptions on how much each individual would react to a given tax incentive policy given their characteristics are based on a review of the academic literature, and are detailed in the 'model inputs' section below.

During the second stage, individuals who undertook *additional* training compared to the status quo enjoy an *additional* increase in their wages, and hence pay a higher amount in taxes as a result. Hence, two estimates of the cost to the Exchequer can be produced: the immediate cost (which is equal to the 'benefit' from tax incentives enjoyed by individuals), and the net cost – which is equal to the immediate cost minus the additional taxes paid due to the increase in wages following the additional investments in training by individuals.

This process is repeated by successive cohorts each year following the introduction of the policy, leading to changes to the overall impact and net cost of the policy over time until a steady state is reached<sup>26</sup>.

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<sup>26</sup> The steady state is attained when 'additional skills' developed by the latest cohort equal 'depreciation (depletion) of existing skills' by previous cohorts.

## The Data

The model is applied on data from the July to September quarter 2015<sup>27</sup> of the Labour Force Survey (LFS), while estimates from the UK Commission's Employer Skills Survey 2015 (UKESS 15) are also utilised with respect to the cost of training. While other relevant survey datasets were reviewed, including the Adult Participation in Learning Survey (NIACE), the National Adult Learning Survey (NALS) and the Adult Education Survey (AES) to inform this analysis and compare findings, data or findings from these were not used in the modelling.

More details about the datasets above can be found in the Annex.

## Model Inputs

### Estimating Individual Expenditure on Training

While LFS respondents are asked whether they undertook work-related training, who paid the fees, what the length of the course was, and hours of tuition, they do not provide a key piece of information for this analysis, namely the cost of the training courses/events undertaken. According to UKESS 15, total expenditure by *employers* on fees for external providers was £3 billion in 2015 (£2.2 billion for course-related off-the-job training and £0.8 billion for other off the job training). The LFS contains detailed data on the volume<sup>28</sup> of off-the-job training funded by employers involving fees to external providers, which can be used to arrive at an estimate of the average cost per day of training. This can then be applied to LFS data on the volume of work-related training funded by *individuals*<sup>29</sup> to estimate total expenditure by each individual in the sample.

It should be highlighted that, given the uncertainty around some of the adopted assumptions, all estimates presented in this report should be treated as approximate, and they are likely to deviate to some extent from the 'true' figures.

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<sup>27</sup> This is the latest available quarter in which the questions on job related training that are central to this analysis were asked. The reason why only one quarter of data is used (rather than LFS data covering at least an entire year) is that the training questions that are central to the analysis are not asked in every quarter.

<sup>28</sup> While 'hours of tuition' could be expected to provide a better guide to course intensity and hence cost than 'training length' – as training courses can have widely varying intensity - the former variable is not recorded consistently across all LFS respondents. To rectify this, data from individuals who have provided an answer to both questions (length of course and hours of tuition) were used to estimate average hours of tuition per month depending on the length of the course. Courses lasting 'less than a week' involved around a full day (8 hours) of tuition on average; courses lasting 'one week to less than two months' around two and a half days per month, courses lasting for 'two months to less than one year' around one and a half days per month; courses lasting 1 year to less than 3 years around 2.5 days per month; courses lasting 3 years or more around 2 days per month; and finally 'on-going' courses around 1 day per month.

<sup>29</sup> It is assumed that the average cost per day of training supplied by external providers and funded by employers is similar to the average cost per day of training funded by individuals.

**Table 4 Total training expenditure broken down by individual components**

	2011	2013	2015
<i>Unweighted Base:</i>	11,027	12,522	12,614
	£billion	£billion	£billion
<b>Total training expenditure</b>	<b>£43.8bn</b>	<b>£43.0bn</b>	<b>£45.4bn</b>
<i>On-the-job training: Total</i>	<i>£22.7bn</i>	<i>£21.7bn</i>	<i>£22.6bn</i>
<i>Off-the-job training: Total</i>	<i>£21.1bn</i>	<i>£21.3bn</i>	<i>£22.9bn</i>
<i>of which:</i>			
Fees to external providers (course-related)	£2.7bn	£2.4bn	£2.2bn
Fees to external providers (other - seminars, workshops etc.)	£1.0bn	£0.9bn	£0.8bn

*Base: Establishments completing the Investment in Training study*

*Source: UKESS<sup>30</sup>*

## Model Parameters

The model simulates the decisions of individuals with regards to how much training to undertake, and the effect of training on their wages over time as well as the cost to the Exchequer. To calibrate the model, it is necessary to input parameters relating to:

- The price elasticity of demand of training – in other words, how much more training will individuals undertake in the presence of tax incentives.
- The returns to this training – i.e. how much should each person undertaking training expect their wage to increase as a result of the additional training undertaken as a result of the tax incentives.

The choice of parameter values was not based on a simple average of results in the literature, as these range widely depending on the setting and methodology. Instead, these were selected by applying judgement and subjectively weighing more heavily studies that have a more robust methodology, are more recent, relate to work-related training rather than other training/education, and are in the UK or similar countries as compared to countries with significant social and economic differences.

For the central scenario, the assumptions adopted are relatively conservative, both with regards to the demand response to the tax incentives and returns to training. However, given the wide range of estimates in the literature and the inherent uncertainty in picking

<sup>30</sup> More details on the methodology behind these estimates can be found in the ESS technical papers, available at:

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/303483/evidence-report-63-uk-ess-2011-technical-report.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/303483/evidence-report-63-uk-ess-2011-technical-report.pdf)

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/303497/ukces-employer-skills-survey-13-technical-report.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/303497/ukces-employer-skills-survey-13-technical-report.pdf)

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/495448/UKESS\\_2015\\_Technical\\_Report.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/495448/UKESS_2015_Technical_Report.pdf)

the right parameters, high response/ high returns scenarios were also estimated to assess the sensitivity of the results to the underlying model assumptions.

## Behavioural Response

For the central scenario, an average price elasticity of demand for training of -0.5% is adopted, i.e. under this scenario it is assumed that the volume of training increases by 5% for every 10% decrease in the effective price of training faced by individuals<sup>31</sup>. For sensitivity analysis purposes, a high response scenario is also examined, where it is assumed that a 10% decrease in the effective price of training would cause the volume of training to increase by 20%. These average values are further adjusted depending on key individual characteristics (gender, educational background, income, occupation) to reflect findings in the literature regarding the different response of these groups to the introduction of incentives. The table below shows the adjustments in detail.

**Table 5 Adjustments to average price elasticity of demand**

Gender	Highest educational qualification	Occupational status	Wage income quartile
Men -5%	Tertiary education: -20%	Elementary occupations +20%	1st quartile +40% 2nd quartile +20%
Women +5%	Compulsory education only: +20%	Managers -20%	3rd quartile -20% 4th quartile -40%

<sup>31</sup> That is the actual price paid to the training provider minus any tax incentive to the individual.

## Returns to Work-Related Training

With regards to returns to work-related training, a conservative approach is also adopted, and an assumption of relatively low returns to work-related training for the central scenario is utilised. A high returns scenario – although with parameters still well within the bounds of estimates in the academic literature - is also estimated for sensitivity analysis purposes. Specifically, for the central scenario, returns<sup>32</sup> are specified to be 0.5%, and for the high returns scenario they are set at 3%. No adjustments are introduced to these average values depending on individual characteristics, as there are contradictory findings in the literature regarding differentiation of returns between groups.

Given the findings in the literature regarding skills depreciation, it is assumed for both scenarios that individuals enjoy this boost in their productivity and wages for five years from the date they undertake training before reverting - in the absence of additional training - to their previous state<sup>33</sup>.

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<sup>32</sup> These returns refer to typical involvement in a month-long course involving around 16 hours of tuition.

<sup>33</sup> The five-year cut-off point was chosen based on the limited available evidence (e.g. Bartel (2000) suggests that reasonable estimates of skills depreciation could be up to an average of 20% per year). The literature provides little guidance as to the likely profile over time of such depreciation (i.e. whether it is uniform across time, or slows down/speeds up as time passes), so an assumption of no depreciation over the first five years and then full depreciation after year five was chosen to aid transparency and ensure that the results are not driven by the specific depreciation time-profile chosen.

## 4 Tax Incentive Policies

### 4.1 Modeled Policies

As discussed in the section on international approaches, there are a number of different ways tax incentives for individuals can be designed and implemented<sup>34</sup>. In broad terms, tax incentives for spending on training by individuals can vary across the following key dimensions:

*Refundable versus non-refundable.* Non-refundable tax credit approaches operate via reducing an individual's tax liability up until the liability is exhausted –in other words, the value of the tax incentive cannot exceed the total value of the liability. Refundable tax credits remove this restriction by allowing payments from the tax authority to individuals when the value of the incentive exceeds the value of the liability.

*The rate at which the incentive applies.* The incentive can apply at the full marginal tax rate faced by the individual, or at a different rate – for example, an individual may only be able to deduct spending on training at the basic rate of tax, or there may be a cap to the total permissible amount that can be deducted.

*The tax base.* The incentive can only apply to income tax payments, national insurance contributions, or both.

*Eligible expenditure.* The incentive can apply to all training expenditure, or it can exclude certain types of training – for example training that does not lead to a qualification, or training that is not delivered by suitably certified providers.

*Individual eligibility criteria.* The incentive can apply to all individuals, or to specific groups only – for example individuals with low qualifications or low income.

*Administration.* The incentive can be delivered via the income tax system, or alternative arrangements can be used – for example delivery via the benefits system, via a voucher-type arrangement, or via training providers.

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<sup>34</sup> Please note that incentives for training expenditure partially or fully funded by employers are not considered, regardless of whether these incentives are delivered via the personal income tax system. To give an example, a policy proposal to extend the existing system of tax-free support payments to individuals undertaking full-time study to cover all work-related training is not within the scope of this analysis.

This report focuses on self-funded<sup>35</sup> work-related training, regardless of whether it leads to a qualification or not. Any investment in skills that does not relate to current or potential future employment is excluded, as is all primary, secondary, and initial post-secondary education<sup>36</sup>. In addition, self-funded training by the self-employed is also excluded, as for tax purposes this is treated in a similar way to training funded by employers.

For the purposes of this analysis, the following policies were selected as broadly representative of the possible options to introduce tax incentives for investments in work-related skills by individuals:

**Policy 1: ‘Deduction’.** Under this policy, individuals can deduct self-funded expenditure from their total taxable income, in a similar way to companies deducting expenses from their revenues to arrive at taxable profits. For example, an individual earning £20,000 who spent £1,000 on training in a tax year would only pay tax and national insurance contributions on £19,000. This policy is equivalent to a non-refundable tax credit; an individual with no income, or earning below the tax-free allowance, would not benefit. In the same vein, individuals with high incomes facing a high marginal tax rate would benefit by more than individuals on lower incomes facing lower marginal tax rates.

**Policy 2: ‘Flat 20’.** Under this policy, individuals can claim 20%<sup>37</sup> off their expenditure on work-related training regardless of their income – i.e. the policy is equivalent to a refundable tax credit. For example, an individual spending £1,000 on work-related training could either get a discount of £200 off their income tax bill for the year, or have £200 directly paid to them if their income is zero or within the income tax allowance for the financial year in question.

**Policy 3: ‘Mix’.** Under this policy, individuals would benefit from the most advantageous of the two policies outlined above based on their circumstances. In other words, individuals facing a marginal tax rate over 20% would receive the same tax incentive as under the ‘Deduction’ policy, while those facing a marginal tax rate below 20% would benefit in line with the ‘Flat 20’ policy.

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<sup>35</sup> This includes training funded by ‘family or relatives’ as well as training funded directly by the individual being trained.

<sup>36</sup> Specifically, the individuals excluded from the ‘eligible population’ in the LFS sample are those younger than 16 or older than 69, those ‘still in continuous education’ unless aged over 25, and the self-employed. Expenditure on work-related training is only deemed eligible for the purposes of the policies discussed here if the applicable fees were paid by ‘the individual, family, or relatives’.

<sup>37</sup> 20% is chosen as it is the current basic rate of income tax, but of course there is nothing preventing the government introducing a refundable tax credit for training at a different rate.

## 4.2 Administration

When designing tax policy it is important to think carefully about administration. Firstly, a tax policy that looks attractive on paper may not be feasible in practice if it imposes high administrative costs – for example if it is too complicated or inconsistent with the rest of the tax system. In addition, policy delivery can have a large impact on effectiveness: a policy which provides visible support and is seen as ‘user-friendly’ is likely to be more successful than a policy that is not well understood or is perceived to be complicated, even if they both provide the same level of financial support.

Policy implementation and delivery issues are not examined in detail in this report as they would critically depend on the final policy design and aims, but the high-level review undertaken for this report suggests that administration of tax incentives would be feasible within the current system at relatively low cost. There are already many information exchange channels between individuals and the government, with a large number of taxpayers required to file regular tax returns which could easily be adapted to accommodate training tax incentives. In addition, forms used by benefit claimants (universal credit, working tax credits, child tax credit, other benefits) could also be used for the same purpose.

Delivery of tax incentives is potentially more complicated for those who do not claim any benefits and are not required to file a tax return, however even in that case the additional burden will likely be small and manageable. For example, individuals undertaking work-related training could be allowed to file ad hoc tax returns, or may be allowed to claim the tax incentive via the training providers. Another potential solution could be adapting the PAYE system, perhaps along the lines of existing procedures for refunding tax overpayments.

### Simplicity is Key

Administrative costs are costs incurred by the tax authority in establishing and operating systems to manage all aspects of taxation. Administrative costs depend on a range of factors, including the complexity of the tax, characteristics of the tax base, structure of tax rates, frequency of reform, and organization and efficiency of the tax authority<sup>38</sup>. In general, complexity and lack of clarity in tax law is likely to lead to higher administrative and compliance costs.<sup>39</sup>

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<sup>38</sup> Shaw, Slemrod and Whiting (2012). Administration and Compliance, Chapter 12. Mirrless Review, IFS.

<sup>39</sup> Evans, C. (2003), Studying the Studies: An overview of recent research into taxation operating costs, *Journal of Tax Research*, 1, 64–92.

A recent study in the US<sup>40</sup> shows that complexity in the student aid tax code may be preventing some taxpayers from taking advantage of the available incentives. In the US, tax-based federal student aid offers students and their families a menu of tax incentives. According to the study, taxpayers who are eligible for more than one tax-based aid program, and who are limited to one program per student each year, often fail to select the single program that offers the largest reduction in taxes. The study also shows that the loss is disproportionately larger for lower-income taxpayers.

The UK government's central objective for the tax system is to

*“ make it more competitive, simpler, greener and fairer” and “... to restore the UK tax system's reputation for predictability, stability and simplicity.”*

To help achieve its objective the government launched the Office of Tax Simplification (OTS) in 2010. In a recent report<sup>41</sup> the OTS highlights (employer) training expenses as one of the most important areas

*“... for consideration of policy objectives and evaluation of whether the current tax rules are delivering what policymakers want.”*

Their evidence suggest that the current rules are not delivering a clear policy and that

*“...extending the exemption could encourage positive behaviour change as well as simplifying the tax system.”*

With this in mind, it seems likely that some changes will be made in the future towards a simpler system, and any tax incentives for training funded by individuals should be examined within this wider framework.

## **Tax Incentives versus Other Support Policies**

From an administration point of view, tax incentives have both advantages and disadvantages compared to other ways of encouraging investment in skills, such as direct funding or the use of vouchers. Tax incentives generally allow more freedom of choice and potentially have lower administration costs compared to directly funded policies that don't rely on existing systems. On the other hand, unlike direct funding arrangements, tax incentives often operate with a lag from payment to refund which could deter participation, and may in some cases create opportunities for tax evasion or fraud.

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<sup>40</sup> Turner (2011), Why Don't Taxpayers Maximize their Tax-Based Student Aid? Salience and Inertia in Program Selection, The B.E. Journal of Economic Analysis & Policy. Volume 11, Issue 1.

<sup>41</sup> OTS (2014) Review of Employees Benefits and Expenses, Office for Tax Simplification.

## 5 Model Output and Analysis

### 5.1 Summary Results

Table 6 Summary results- descriptive statistics

Population aged 16-69	Eligible population	Eligible individuals undertaking self-funded work-related training in the past four weeks	Annual private expenditure on training (£ million)	Annual private expenditure on training (£) per "eligible" individual
44,285,522	36,669,549	316,855	£1,244	£34

It is estimated that each year individuals in the UK self-fund around £1.25 billion of work-related training, which is around £34 per eligible<sup>42</sup> individual. Please note that, given the uncertainty around some of the assumptions employed in arriving at this figure (discussed in detail in Section 3), all numbers presented in this section should be treated as best possible estimates rather than definitive statistics.

For comparison purposes, Williams et al (2010) use the NALS and estimate that for the 2007-08 financial year net expenditure by individuals (excluding the self-employed) towards the direct costs of learning was £3.2 billion<sup>43</sup>, but it should be stressed that their estimate includes all learning (rather than just work-related training) while also covering expenditure by groups excluded from this analysis (e.g. individuals still in continuous education).

The table below shows Labour Force Survey (LFS) figures on the number of people attending work-related training during the past four weeks, broken down by funding source. The total number of individuals self-funding training in any given quarter is close to 650,000, while for the purposes of this analysis around half of those would be 'eligible' under the proposed policies covered in this section.

<sup>42</sup> Eligible individuals for the purposes of the policies modelled in this report include individuals aged between 16-69 who have completed their continuous full-time education, whether they are employed, unemployed or inactive. The group of eligible individuals also excludes the self-employed. Please see the 'Modelled Policies' section for more details.

<sup>43</sup> In their paper, Williams et al (2010) also add an extra £0.4 billion for undergraduate HE fees for under-25s and £0.8 billion of contribution to fee loans, bringing the total to £4.4 billion.

**Table 7 Number of people attending training in the past 4 weeks by 'who paid fees for training'**

No answer	6,824
Employer or potential employer*	1,043,325
ELWa/LEC	17,897
Other government or local authority organisation	330,836
Self, family, or relatives**	643,659
Other	73,087
No fees	307,119
Don't know	51,041

*\*Employer includes only those cases where all or part of the training was off the job - i.e. excludes on-the-job training.*

*\*\*Includes training classified as work-related undertaken by those still in continuous education, as well as training by the self-employed.*

The table below shows model estimates under the central scenario with regards to the likely impact of each of the three modelled policies, as well as the cost to the Exchequer. Policy 1 ('Deduction') which is equivalent to a non-refundable tax credit for expenditure on work-related training would increase total expenditure on training by individuals by 2% (or around £28 million), at an initial annual cost to the Exchequer in terms of foregone revenues of around £87 million, falling to around £30 million at steady state (year five and beyond) once the increase in income tax payments by individuals who have undertaken training is taken into account<sup>44</sup>.

Policy 2 - 'Flat 20' (the equivalent of a refundable tax credit at a fixed 20% rate) and Policy 3 - 'Mix' (a composite policy whereby individuals benefit from the most advantageous of the 'Flat 20' and 'Deduction' policies) are much more effective in increasing spending on training, but come at a higher cost to the Exchequer both in the short and the long run. The reason for this, as will be discussed in more detail later on in this section, is that the 'Flat 20' and 'Mix' policies offer more generous support than the 'Deduction' policy to individuals with relatively low incomes who pay little or no tax.

The estimated increase in training expenditure under the central scenario for these policies is around £110 million (9%), and the Exchequer cost is around £270m for the former and £310 for the latter, falling to around £240 and £250 from year 5 onwards respectively.

<sup>44</sup> The methodology behind the numbers is explained in detail in section 3 of this report. In a nutshell, the cost to the Exchequer falls over time as the additional work-related training undertaken by individuals increases their productivity and wages, leading to higher income tax payments and hence reducing the effective cost of the tax incentives on training. Please note that the estimates of Net Cost to the Exchequer at steady state presented in this section do not take into account the likely increase in Corporation Tax payments due to the increase in worker productivity, and hence likely overestimate the steady-state Exchequer cost of the policies examined.

**Table 8 Summary results- central scenario**

	<b>Annual private expenditure on training (£ million)</b>	<b>Change in total training expenditure compared to no incentives (£ million)</b>	<b>% Change in total training expenditure compared to no incentives</b>	<b>Annual Exchequer cost of tax incentive</b>	<b>Net cost to the Exchequer - Year 5 and onwards (steady state)</b>
Policy 1:					
Deduction	£1,272	£28	2%	£87	£31
Policy 2:					
Flat 20	£1,355	£111	9%	£271	£241
Policy 3:					
Mix	£1,365	£122	10%	£309	£252

Tables 9 and 10 below show how the main results vary under the pure deadweight scenario (i.e. under the assumption that the policies are completely ineffective in incentivising additional work-related training) and the high response scenario (which assumes a relatively high behavioural response to the tax incentives).

**Table 9 Summary results- annual cost to the Exchequer (£ million)**

	<b>Central scenario (Average PED=-0.5)</b>	<b>No behaviour (pure deadweight) scenario</b>	<b>High response scenario (Average PED=-2)</b>
Policy 1:			
Deduction	£87	£78	£114
Policy 2:			
Flat 20	£271	£249	£338
Policy 3:			
Mix	£309	£280	£393

**Table 10 Summary results- change in total training expenditure compared to no incentives**

	<b>Central scenario (Average PED=-0.5)</b>		<b>High response scenario (Average PED=-2)</b>	
	<b>£ million</b>	<b>% increase compared to no incentives</b>	<b>£ million</b>	<b>% increase compared to no incentives</b>
Policy 1:				
Deduction	£28	2%	£112	9%
Policy 2: Flat 20	£111	9%	£446	33%
Policy 3: Mix	£122	10%	£486	36%

Based on the numbers above, the policy deadweight can also be estimated – that is the percentage of public spending that is offset by a drop in private expenditure on work-related training. Under the central scenario, policy deadweight varies between 59% to 68% depending on the policy pursued – in other words, between 32% and 41% of the cost to the Exchequer translates to additional spending on training, with the remainder merely being a transfer from the Exchequer to individuals.

Under the high response scenario, the policy deadweight is estimated to range between close to zero for the ‘Deduction’ policy to -32% for the ‘Flat 20’ policy. In other words, in the high response scenario, the tax incentive provided does not crowd out private expenditure, and in fact under the ‘Flat 20’ and ‘Mix’ policies it encourages additional private expenditure compared to the no incentives scenario. More specifically, it is estimated that under the ‘Mix’ policy every £1 in cost to the Exchequer is translated to an extra £2.24, with the extra 24p representing additional private expenditure on training compared to private expenditure in the absence of the tax incentive.

**Table 11 Summary results- policy deadweight (percentage of tax incentive that is offset by drop in private expenditure on training)**

	Central scenario (PED=-0.5)	High response scenario (PED=2)
Policy 1: Deduction	68%	2%
Policy 2: Flat 20	59%	-32%
Policy 3: Mix	61%	-24%

Finally, tables 12 and 13 show detailed costings by year since introduction for each of the three modelled policies, under the central scenario and high response/high returns scenario respectively. As discussed in detail in the methodology section, the Exchequer cost of the policies is highest in year 1, but falls each year until it reaches its steady state value in year 5. The ‘Flat 20’ and ‘Mix’ policies carry a significantly higher cost to the Exchequer compared to the ‘Deduction’ policy both initially and at steady state (year 5 onwards) reflecting the fact that many of the people undertaking self-funded work-related training have relatively low incomes and subsequently pay little tax – and hence would not benefit much from a policy of deducting the costs of training from their taxable income.

Under the conservative assumptions of the central scenario, the overall cost to the Exchequer is relatively low, ranging (at steady state) from £31 million per year in the case of the ‘Deduction’ policy to £252 million in the case of the ‘Mix’ policy.

Under the high response/high returns scenario, the net cost to the Exchequer is actually positive in steady state for all the policies examined – the additional income tax payments arising from the fact individuals benefit from higher wages following training more than offset the cost of the tax incentives – with the overall gain to the Exchequer being highest in the case of the ‘Deduction’ policy.

It is important to note here that, as discussed in more detail in the ‘Review’ and ‘Model’ sections of this report, the model parameters that were employed for the high response/high returns scenario are well within the bounds of the range of estimates found in the academic literature, and also that the estimates presented here do not include the impact of likely higher tax receipts from corporation tax, VAT, and other taxes due to increased worker productivity following training.

With this in mind, the results presented in tables 12 and 13 provide evidence that any policy of providing tax incentives will at most only have a relatively low net cost to the Exchequer, and it is possible it may even generate a net benefit once other tax flows are taken into account, especially in the medium to long-run.

**Table 12 Summary results- net cost to the Exchequer, £million (central scenario)**

<b>Foregone revenue from tax incentives minus additional income tax receipts due to higher income of trained individuals</b>					
	Year 1	Year 2	Year 3	Year 4	Year 5 and onwards (steady state)
Policy 1: Deduction	£76	£65	£53	£42	£31
Policy 2: Flat 20	£265	£259	£253	£247	£241
Policy 3: Mix	£297	£286	£275	£263	£252

**Table 13 Summary results- net cost to the Exchequer, £million (high response, high returns scenario)**

<b>Foregone revenue from tax incentives minus additional income tax receipts due to higher income of trained individuals</b>					
	Year 1	Year 2	Year 3	Year 4	Year 5 and onwards (steady state)
Policy 1: Deduction	-£157	-£428	-£699	-£971	-£1,242
Policy 2: Flat 20	£196	£54	-£88	-£230	-£372
Policy 3: Mix	£121	-£151	-£423	-£695	-£966

*NB: Negative (-) figures show a gain to the Exchequer, while positive figures denote a cost.*

Finally, it is important to highlight that the analysis presented here only looks at the net cost to the Exchequer, and does not include the substantial benefits enjoyed by individuals (both in terms of reduced tax payments associated with training costs and higher earnings in the future), employers (through increased worker productivity and higher profits), and society at large (through the positive externalities associated with training).

The following sections present more disaggregated results and discuss the likely impact of tax incentives on different population groups, as well as the cost to the Exchequer of applying the policies examined in a targeted rather than universal manner.

## 5.2 Results by Employment Status

Table 14 By employment status- descriptive statistics

Employment status	Number of individuals	Number of eligible individuals	Eligible individuals undertaking self-funded work-related training in the past four weeks	Private expenditure on training
Employee	26,052,864	25,209,472	179,554	£
Self-employed	4,321,995	0	0	£
Government employment and training programmes	108,523	0	0	£
Unpaid family worker	82,999	79,044	0	£
ILO unemployed (up to 12 months)	1,239,689	1,033,418	28,421	£
Long-term unemployed	570,305	538,838	4,147	£
Inactive	11,909,147	9,808,777	104,733	£
<b>TOTAL</b>	<b>44,285,522</b>	<b>36,669,549</b>	<b>316,855</b>	<b>£1</b>

This subsection disaggregates some of the model results by employment status. As can be seen in table 14, around 56% of self-funded work-related training is undertaken by employees (around £690 million annually), but this largely reflects the fact that they are by far the largest group.

The short-term unemployed, while only accounting for 8% of total spending (£104 million), spend almost three times as much on work-related training per person than the employed (£84 versus £27). The level of spending per person is much lower for the long-term unemployed (£28 per person), with the entire group spending around £16 million per year on work-related training. Finally, the economically inactive (i.e. those not in employment and not looking for a job) number almost 10 million eligible individuals and account for 35% of all private spending on training, or £36 per person.

It is important to highlight that, as discussed in the model section of the report, the economically inactive in the eligible category do not include those still in continuous full-time education (e.g. individuals pursuing their first degree), or anyone outside the 16-69 age band. Similarly, for reasons discussed in detail in the model section, the self-employed are not included in the target group for the policies discussed here, and hence are excluded from the analysis.

As detailed in table 15, the 'Mix' policy is expected to increase total spending on work-related training by individuals by 10% under the central scenario, with the impact being fairly similar across groups. Policy deadweight – the percentage of public spending/foregone revenues that goes to fund training that would have been undertaken even in the absence of the tax incentive – is at around 58% for the unemployed and economically inactive, and 63% for employees.

**Table 15 By employment status- central scenario, modelled policy: Mix**

<b>Employment status</b>	<b>Total training expenditure (£ million)</b>	<b>Change in total training expenditure compared to no incentives (£ million)</b>	<b>% Change in total training expenditure compared to no incentives</b>	<b>Policy 'deadweight'</b>
Employee	£762	£70	10%	63%
Self-employed	£0	£0	N/A	N/A
Government employment and training programmes	£0	£0	N/A	N/A
Unpaid family worker	£0	£0	N/A	N/A
ILO unemployed (up to 12 months)	£114	£10	9%	57%
Long-term unemployed	£18	£2	10%	53%
Inactive	£472	£40	9%	58%
<b>TOTAL</b>	<b>£1,365</b>	<b>£122</b>	<b>10%</b>	<b>61%</b>

Under the 'Mix' policy, the short-term unemployed would benefit the most from the introduction of tax incentives, but this mostly reflects the fact they have the highest expenditure on training per person. The group benefiting the most under the 'Mix' policy per pound of spending on training are employees, with 61% of the total Exchequer cost of the tax incentive flowing to them despite the fact they account for only 56% of total expenditure.

Under the central scenario, the Exchequer cost of providing tax incentives under the 'Mix' policy would be around £188 million for employees (falling to around £131 million at steady state), approximately £27 million for the unemployed, and £94 million for the economically inactive<sup>45</sup>.

<sup>45</sup> While there is significant evidence that work-related training increases the probability of the unemployed being able to secure employment – thereby increasing their income tax payments and reducing the amount they claim in benefits - the steady state Exchequer cost of tax incentives for the unemployed and economically inactive is estimated to be the same as the initial annual cost. This is because work-related training is unlikely to affect the 'natural rate of unemployment' – i.e. while work-related training can help the unemployed secure employment, it does not affect the overall unemployment rate which is predominantly driven by wider macroeconomic factors.

**Table 16** By employment status- central scenario, modelled policy: Mix

Employment status	Annual Exchequer cost of tax incentive (£ million)	% of total tax incentive value accruing to group	Tax incentive value per person in group (£)	Net cost to the Exchequer (£ million) - Year 5 and onwards (steady state)
Employee	£188	61%	£7.21	£131
Self-employed	£0	0%	£0.00	£0
Government employment and training programmes	£0	0%	£0.00	£0
Unpaid family worker	£0	0%	£0.00	£0
ILO unemployed (up to 12 months)	£23	7%	£18.40	£23
Long-term unemployed	£4	1%	£6.23	£4
Inactive	£94	31%	£7.92	£94
<b>TOTAL</b>	<b>£309</b>	<b>100%</b>	<b>£6.97</b>	<b>£252</b>

As can be seen in table 17, the ‘Deduction’ policy carries a much lower total cost to the Exchequer, with the vast majority of the benefit flowing to employees (£79 million out of £87 million in total), as the unemployed and economically inactive have low incomes and correspondingly low income tax and NICS payments - and hence would benefit little from a policy of deducting their training expenditures from their overall taxable income. It is interesting to note that, given the policy mainly benefits people on relatively higher incomes, the Exchequer cost at steady state is much lower than the initial cost (£23 million for employees), reflecting the fact that the increase in employee productivity and wages as a result of increased spending on training is taxed at a high marginal tax rate.

In contrast, the ‘Flat 20’ policy benefits people directly in line with their spending on training without reference to their taxable income, hence leading to a flow of close to £100 million to the economically inactive and around £27 million to the unemployed. The Exchequer cost of the ‘Flat 20’ policy for employees is also higher compared to the ‘Deduction’ policy (£150 million versus £79 million), especially at steady state, but this increase is not uniform across all employees: the ‘Flat 20’ policy yields a higher benefit to employees on low incomes and a relatively lower benefit to employees on high incomes.

**Table 17 By employment status- central scenario, modelled policy: Deduction**

<b>Employment status</b>	<b>Total training expenditure (£ million)</b>	<b>Annual Exchequer cost of tax incentive (£ million)</b>	<b>Net cost to the Exchequer (£ million) - Year 5 and onwards (steady state)</b>
Employee	£716	£79	£23
Self-employed	£0	£0	£0
Government employment and training programmes	£0	£0	£0
Unpaid family worker	£0	£0	£0
ILO unemployed (up to 12 months)	£108	£8	£8
Long-term unemployed	£16	£0	£0
Inactive	£432	£0	£0
<b>TOTAL</b>	<b>£1,272</b>	<b>£87</b>	<b>£31</b>

**Table 18 By employment status- central scenario, modelled policy: Flat 20**

<b>Employment status</b>	<b>Total training expenditure (£ million)</b>	<b>Annual Exchequer cost of tax incentive (£ million)</b>	<b>Net cost to the Exchequer (£ million) - Year 5 and onwards (steady state)</b>
Employee	£752	£150	£121
Self-employed	£0	£0	£0
Government employment and training programmes	£0	£0	£0
Unpaid family worker	£0	£0	£0
ILO unemployed (up to 12 months)	£114	£23	£23
Long-term unemployed	£18	£4	£4
Inactive	£472	£94	£94
<b>TOTAL</b>	<b>£1,355</b>	<b>£271</b>	<b>£241</b>

For comparison purposes, table 19 shows the annual cost of the tax incentive associated with the 'Mix' policy under the assumption that the incentive would have no effect in incentivising additional training – i.e. that it would solely constitute a transfer of resources from the Exchequer to individuals undertaking work-related training. While the overall cost of the tax incentive would be somewhat lower in this case, none of the conclusions regarding the relative cost of the tax incentives for the different groups under consideration are materially affected.

**Table 19** By employment status- No behaviour (pure deadweight) scenario, modelled policy: Mix

<b>Employment status</b>	<b>Annual cost of tax incentive (£ million)</b>	<b>% of total tax incentive value accruing to group</b>	<b>Tax incentive value per person in group</b>
Employee	£170	61%	£6.52
Self-employed	£0	0%	£0.00
Government employment and training programmes	£0	0%	£0.00
Unpaid family worker	£0	0%	£0.00
ILO unemployed (up to 12 months)	£21	7%	£16.81
Long-term unemployed	£3	1%	£5.65
Inactive	£86	31%	£7.26
<b>TOTAL</b>	<b>£280</b>	<b>100%</b>	<b>£6.33</b>

### 5.3 Results by Highest Qualification

**Table 20** By highest qualification- descriptive statistics (NB: total excludes individuals who did not provide an answer to question on qualifications)

Highest qualification held	Number of individuals	Number of eligible individuals	Eligible individuals undertaking self-funded work-related training in the past four weeks	Private expenditure on training (£)
Degree or equivalent	11,757,626	10,236,073	148,294	£58,231,000
Higher education	4,056,932	3,503,238	32,564	£13,231,000
GCE, A-level or equivalent	9,935,074	7,628,445	78,536	£31,231,000
GCSE grades A*-C or equivalent	9,275,851	7,411,525	35,976	£14,231,000
Other qualifications	4,034,836	3,488,099	16,747	£6,231,000
No qualification	4,531,737	3,822,450	3,831	£1,231,000
<b>TOTAL</b>	<b>43,592,056</b>	<b>36,089,830</b>	<b>315,948</b>	<b>£1,231,000</b>
No answer	177,233	152,038	907	£2,231,000
Did not know	516,233	427,681		

Consistent with findings in the literature, individuals holding a degree or equivalent account for the bulk of total self-funded expenditure on work-related training (47% of the total) with individuals holding the equivalent of GCSE A\*-C grades and below accounting for 17%. Degree-holders also spend the most on work-related training per person (£50), which is much more than the equivalent figure for people whose highest qualification is GCE, A-levels or equivalent (£31), more than 3 three times the figure for those with GCSE A\*-C or equivalent, and a staggering 15 times more compared to people with no qualifications.

**Table 21** By highest qualification- central scenario, modelled policy: Mix

Highest qualification held	Total training expenditure (£ million)	Change in total training expenditure compared to no incentives (£ million)	% Change in total training expenditure compared to no incentives	Policy 'deadweight'
Degree or equivalent	£630	£47	8%	68%
Higher education	£141	£11	8%	65%
GCE, A-level or equivalent	£345	£34	11%	56%
GCSE grades A*-C or equivalent	£162	£19	13%	44%
Other qualifications	£71	£9	14%	43%
No qualification	£15	£2	15%	52%
<b>TOTAL</b>	<b>£1,363</b>	<b>£121</b>	<b>10%</b>	<b>61%</b>
<i>No answer</i>	£2	£0	11%	52%

Under the central scenario, the 'Mix' policy would lead to an increase on self-funded work-related training of around 8% amongst individuals holding a degree or having completed higher education. This is below the overall average of a 10% increase, and the policy is expected to increase self-funded training lower down the 'highest qualification held' scale by more: 13% amongst individuals with GCSE grades A\*-C or equivalent, 15% amongst individuals with no qualifications, 14% amongst individuals holding other qualifications, and 11% amongst individuals at GCE, A-level or equivalent. The policy deadweight is correspondingly large for highly skilled individuals (68% and 65% for people with degree equivalent and higher education respectively), but falls below 50% in the case of the lower-skilled groups (GCSE grades A\*-C and below).

Tables 22-24 show the cost to the Exchequer associated with targeting the policy to specific groups under the central scenario. The 'Mix' policy would cost around £37 million if solely targeted at people with GCSE grades A\*-C and those with no qualifications only (£33 million at steady state), the 'Deduction' policy would cost £5 million (negligible amount at steady state), and the 'Flat 20' around £35 million (£33 million at steady state) reflecting the fact it would impact on more people on low incomes.

**Table 22** By highest qualification- central scenario, modelled policy: Mix

Highest qualification held	Annual Exchequer cost of tax incentive (£ million)	% of total tax incentive value accruing to group	Tax incentive value per person in group (£)	Net cost to the Exchequer (£ million) - Year 5 and onwards (steady state)
Degree or equivalent	£148	48%	£12.57	£112
Higher education	£31	10%	£7.67	£27
GCE, A-level or equivalent	£76	25%	£7.68	£65
GCSE grades A*-C or equivalent	£33	11%	£3.58	£31
Other qualifications	£15	5%	£3.84	£15
No qualification	£4	1%	£0.93	£2
<b>TOTAL</b>	<b>£308</b>	<b>100%</b>	<b>£7.07</b>	<b>£251</b>
<i>No answer</i>	£0			

**Table 23 By highest qualification- central scenario, modelled policy: Deduction**

Highest qualification held	Total training expenditure (£ million)	Annual Exchequer cost of tax incentive (£ million)	Net cost to the Exchequer (£ million) - Year 5 and onwards (steady state)
Degree or equivalent	£595	£49	£14
Higher education	£132	£8	£4
GCE, A-level or equivalent	£320	£22	£11
GCSE grades A*-C or equivalent	£144	£3	£1
Other qualifications	£63	£3	£2
No qualification	£14	£2	-£1
<b>TOTAL</b>	<b>£1,270</b>	<b>£87</b>	<b>£31</b>
<i>No answer</i>	£2		

**Table 24 By highest qualification- central scenario, modelled policy: Flat 20**

Highest qualification held	Total training expenditure (£ million)	Annual Exchequer cost of tax incentive (£ million)	Net cost to the Exchequer (£ million) - Year 5 and onwards (steady state)
Degree or equivalent	£625	£125	£107
Higher education	£140	£28	£26
GCE, A-level or equivalent	£342	£68	£62
GCSE grades A*-C or equivalent	£161	£32	£31
Other qualifications	£70	£14	£13
No qualification	£15	£3	£2
<b>TOTAL</b>	<b>£1,353</b>	<b>£271</b>	<b>£241</b>
<i>No answer</i>	£2	£0	

For comparison purposes, table 25 below shows the results for the 'Mix' policy under the assumption that tax incentives would have no impact in incentivising additional spending on training.

**Table 25** By highest qualification- No behaviour (pure deadweight) scenario, modelled policy: Mix

Highest qualification held	Annual cost of tax incentive (£ million)	% of total tax incentive value accruing to group	Tax incentive value per person in group
Degree or equivalent	£136	49%	£11.61
Higher education	£29	10%	£7.05
GCE, A-level or equivalent	£68	24%	£6.89
GCSE grades A*-C or equivalent	£29	10%	£3.16
Other qualifications	£13	5%	£3.34
No qualification	£4	1%	£0.80
<b>TOTAL</b>	<b>£280</b>	<b>100%</b>	<b>£6.42</b>
<i>No answer</i>	£0	0%	£2.13

## 5.4 Results by Age Group

Table 26 By age group- descriptive statistics

Age group	Number of individuals	Number of eligible individuals	Eligible individuals undertaking self-funded work-related training in the past four weeks	Private expenditure on training (£ million)
16-24	7,258,249	3,859,672	61,538	£259
25-44	17,003,012	15,184,697	190,427	£749
45-64	16,452,044	14,321,372	64,329	£234
65-69	3,572,217	3,303,808	561	£1
<b>TOTAL</b>	44,285,522	36,669,549	316,855	£1,244

Table 26 shows the highest amount of spending on training per person takes place amongst the 25-44 age group, at around £44 per person. This is more than three times higher than the equivalent figure for 45-64s (£14), with a negligible spending on training per person by 65-69 year olds.

Individuals aged 16-24 spend around £36 on average per person per annum on work-related training, which is roughly at the mid-point between spending per person amongst the 25-44 and the 45-64 groups. That said, it is important to highlight that the 16-24 group comprises of widely varying subgroups in terms of both their current status and their prospects, ranging from individuals who quit school early with few qualifications and have been in the workforce for a number of years, to young people in the NEET category, to people who have just completed their first degree or masters at university level and are looking for work or have already secured employment. As a result, it likely conceals significant heterogeneity in training expenditure between these different sub-categories.

Table 27 shows the likely increase in expenditure on work-related training following introduction of the 'Mix' policy, with individuals in the 16-24 age group showing the largest rise at 11%, with all other groups between 6% and 10%. The policy 'deadweight' is also lowest for the 16-24 group (51%) and ranges between 62% and 71% for the other age groups.

**Table 27** By age group- central scenario, modelled policy: Mix

Age group	Total training expenditure (£ million)	Change in total training expenditure compared to no incentives (£ million)	% Change in total training expenditure compared to no incentives	Policy 'deadweight'
16-24	£287	£28	11%	51%
25-44	£821	£72	10%	62%
45-64	£255	£21	9%	66%
65-69	£1	£0	6%	71%
TOTAL	£1,365	£122	10%	61%

Tables 28-30 show the cost to the Exchequer under the central scenario of each of the three modelled policies, with table 31 containing results for the 'pure deadweight' case for comparison. The lion's share of the cost under all policies corresponds to tax incentives going to the 25-44 age group, with individuals in this group also enjoying a far higher tax incentive on a per person basis regardless of the policy under consideration.

**Table 28 By age group- central scenario, modelled policy: Mix**

Age group	Annual Exchequer cost of tax incentive (£ million)	% of total tax incentive value accruing to group	Tax incentive value per person in group (£)	Net cost to the Exchequer (£ million) - Year 5 and onwards (steady state)
16-24	£58	19%	£8.02	£57
25-44	£188	61%	£11.04	£149
45-64	£62	20%	£3.79	£46
65-69	£0	0%	£0.07	£0
<b>TOTAL</b>	<b>£309</b>	<b>100%</b>	<b>£6.97</b>	<b>£252</b>

**Table 29 By age group- central scenario, modelled policy: Deduction**

Age group	Total training expenditure (£ million)	Annual Exchequer cost of tax incentive (£ million)	Net cost to the Exchequer (£ million) - Year 5 and onwards (steady state)
16-24	£262	£6	£4
25-44	£768	£56	£17
45-64	£241	£26	£10
65-69	£1	£0	£0
<b>TOTAL</b>	<b>£1,272</b>	<b>£87</b>	<b>£31</b>

**Table 30 By age group- central scenario, modelled policy: Flat 20**

Age group	Total training expenditure (£ million)	Annual Exchequer cost of tax incentive (£ million)	Net cost to the Exchequer (£ million) - Year 5 and onwards (steady state)
16-24	£287	£57	£56
25-44	£814	£163	£142
45-64	£253	£51	£43
65-69	£1	£0	£0
<b>TOTAL</b>	<b>£1,355</b>	<b>£271</b>	<b>£241</b>

**Table 31** By age group-No behavior (pure 'deadweight') scenario, modeled policy: Mix

<b>Age group</b>	<b>Annual cost of tax incentive (£ million)</b>	<b>% of total tax incentive value accruing to group</b>	<b>Tax incentive value per person in group (£)</b>
16-24	£52	19%	£7.22
25-44	£171	61%	£10.04
45-64	£57	20%	£3.47
65-69	£0	0%	£0.07
<b>TOTAL</b>	<b>£280</b>	<b>100%</b>	<b>£6.33</b>

## 5.5 Results by Occupation

Table 32 By occupation- descriptive statistics

Occupation	Number of individuals	Number of eligible individuals	Eligible individuals undertaking self-funded work-related training in the past four weeks
Managers, Directors And Senior Officials	3,628,169	2,934,779	19,367
Professional Occupations	6,994,496	6,255,843	67,244
Associate Professional And Technical Occupations	4,920,895	4,118,147	38,966
Administrative And Secretarial Occupations	4,206,794	3,997,379	32,437
Skilled Trades Occupations	3,901,544	2,770,843	12,491
Caring, Leisure And Other Service Occupations	3,635,873	3,211,466	54,079
Sales And Customer Service Occupations	3,066,085	2,597,634	24,733
Process, Plant And Machine Operatives	2,450,615	2,083,685	5,175
Elementary Occupations	4,644,204	3,924,601	30,079
Does not apply	6,802,687	4,741,625	32,284
<b>TOTAL</b>	<b>44,251,362</b>	<b>36,636,002</b>	<b>316,855</b>
<i>No answer</i>	<i>34,160</i>	<i>33,547</i>	

Table 32 shows results disaggregated by occupational group, based on the individual's occupation in their current 'main job' or, if the individual was not employed at the time of the survey, the individual's occupation in their previous job. The 'does not apply' category mainly includes individuals who are not employed and never held a job previously.

While the total spending figures are interesting, they largely reflect the fact that the different groups have different sizes – at the two extremes, Professional Occupations comprise well over six million individuals eligible for the policies examined in this report, while Process, Plant and Machine Operatives just over two million. As a result, it is much more informative to look at self-funded training per person in each group.

Caring, Leisure and other Service Occupations top the list with expenditure of £63 per person, followed by Professional Occupations (£35 per person). At the other end of the scale, Process, Plant and Machine Operatives spend a mere £8 per person, possibly reflecting the firm-specific skills required that render the more general-purpose training usually procured by individuals less relevant. Individuals in Skilled Trades also spend a low amount of around £14 per person, followed by Managers, Directors and Senior Officials (around £20).

It is interesting to compare these results with findings on skills gaps from the UK Commission's Employer Skills Survey 2015 (see box 2 below and the accompanying chart). As a general finding, no straightforward correlation emerges between low spending by individuals and skills shortages within a particular occupation, due to variation in the skills intensity required in each occupation and differing levels of investment in skills by employers and the government.

The highest skills shortages are observed amongst the Skilled Trades Occupations (vacancy skills-shortage density of 43%), partly reflecting the very low amount of spending on work-related training by individuals in the occupation. Notably, Machine Operatives exhibit the second highest vacancy skills-shortage density (33%). At the other end of the scale, Administrative/ Clerical staff exhibit low vacancy skills-shortage density (11%).

**Box 2 From UK Commission's Employer Skills Survey 2015 (evidence report 97)**

Where establishments had vacancies, the labour market was largely able to meet the recruitment needs of employers: only a third of vacancies across the UK were considered hard-to-fill (33 per cent). Where employers had hard-to-fill vacancies, these were mainly due to a lack of skills, qualifications or experience among applicants (69 per cent of all vacancies that were hard-to-fill). This equates to six per cent of establishments having at least one skill-shortage vacancy at the time of ESS 2015 fieldwork. The six per cent of establishments with at least one skill-shortage vacancy at the time of ESS 2015 fieldwork represent a significant increase from the four per cent of establishments that reported having skill-shortage vacancies in 2013. This indicates that skill-shortage vacancies present a growing challenge to employers.

Moreover, in volume terms, there was a substantial increase in the number of reported skill-shortage vacancies compared to 2013: from just under 150,000 to almost 210,000 – an increase of 43 per cent in the proportion of vacancies that were proving to be hard-to-fill because applicants lacked the required skills, qualification or experience required for the role.

This increase in the number of skill-shortage vacancies was broadly in line with the growth in volume of vacancies (42 per cent) and, thus, the density of skill-shortage vacancies (i.e. the number of skill-shortage vacancies as a proportion of all vacancies) was largely unchanged at 23 per cent compared with 22 per cent in 2013.

Figure 3 shows the pattern of skill-shortage vacancy density by occupation, sector and occupation within sectors. A number of these pockets of deficiency have proved to be persistent over time.

By occupation, it was among Skilled Trades where density of skill-shortage vacancies was greatest (43 per cent). This occupation has historically had the greatest density of skill-shortage vacancies, both in ESS 2011 and 2013 but also the legacy surveys conducted in each of the countries of the UK.

The number of skill-shortage vacancies in the Construction sector has more than doubled since 2013: from 5,000 to 11,900. To some extent this reflects the increased recruitment activity in the sector. However, the rate of growth in skill-shortage vacancies outpaced the growth of vacancies in this sector. This indicates that Construction employers have faced significant, and increasing, challenges in recruiting sufficiently skilled labour.

**Figure 3 Density of skill- shortage vacancies by occupation and sector**

	Managers	Professionals	Associate Professionals	Administrative/ Clerical staff	Skilled Trades occupation	Carling, Leisure and Other Services	Sales and Customer Services	Machine Operatives	Elementary staff
UK	17	32	22	11	43	20	16	33	16
Agriculture	**	**	**	**	32	**	**	32	15
Manufacturing	30	38	25	12	52	**	14	22	19
Electricity, Gas and Water		67	44	21	45	**		35	16
Construction	23	36	38	10	37	**	25	48	33
Wholesale and Retail	18	18	32	19	51	**	14	23	12
Hotels and Restaurants	24		10	13	37	15	6	14	15
Transport and Communications	14	37	23	9	44	6	41	51	11
Financial Services	6	15	41	9	**	**	14	**	**
Business Services	15	37	23	12	52	19	19	26	21
Public Administration	**	11	3	5	**	10	**	**	16
Education	6	18	14	4	14	21	**	**	9
Health and Social Work	14	38	17	8	11	19	12	29	9
Community, Social and Personal Services	14	20	11	14	43	24	7	54	20

Base: All establishments with vacancies within each occupation by sector

Densities are based on skill-shortage vacancies as a proportion of all vacancies within each occupation by sector, rather than number of establishments with vacancies.

\*\*\* Figure not shown because of a low base (fewer than 25 establishments with vacancies)

Where base between 25 and 49 establishments with vacancies, figures are shown in italics

- X** = density 30% or above
- X** = density between 15% and 29%
- X** = density between 1% and 14%

Source: UK Commission's Employer Skills Survey 2015: UK Results Evidence Report 97 January 2016

As shown in table 33, introduction of the 'Mix' policy is expected to increase annual investment in work-related training by individuals by around 11% in the Skilled Trades occupations, but only 8% in the Professional occupations and Managers, Directors and Senior Officials. Elementary occupations would benefit the most, with a projected 13% increase in self-funded work-related training by individuals.

**Table 33** By occupation- central scenario, modelled policy: Mix

<b>Occupation</b>	<b>Total training expenditure (£ million)</b>	<b>Change in total training expenditure compared to no incentives (£ million)</b>	<b>% Change in total training expenditure compared to no incentives</b>	<b>Policy 'deadweight'</b>
Managers, Directors And Senior Officials	£78	£6	8%	69%
Professional Occupations	£264	£19	8%	73%
Associate Professional And Technical Occupations	£155	£11	8%	68%
Administrative And Secretarial Occupations	£141	£13	11%	57%
Skilled Trades Occupations	£59	£6	11%	58%
Caring, Leisure And Other Service Occupations	£254	£27	12%	53%
Sales And Customer Service Occupations	£108	£9	9%	58%
Process, Plant And Machine Operatives	£22	£2	12%	50%
Elementary Occupations	£138	£16	13%	44%
Does not apply	£148	£12	9%	58%
<b>TOTAL</b>	<b>£1,365</b>	<b>£122</b>	<b>10%</b>	<b>61%</b>

Tables 34-36 show the projected cost to the Exchequer of targeting tax incentives to specific occupational groups under the central scenario, with table 37 presenting the same results for the 'pure deadweight' case for comparison purposes. Providing tax incentives to the group exhibiting the highest vacancy skills-gap density (Skilled Trades occupation) would only cost £14 million on an annual basis (£10 million at steady state) under the 'Mix' policy, £5 million (£1 million at steady state) under the 'Deduction' policy, and £12 million (£10 million at steady state) under the 'Flat 20' policy.

Providing tax incentives for training by Professionals, the occupation group exhibiting the third highest vacancy skills-shortage density, would cost £69 million (£46 million at steady state) for the 'Mix' policy, £33 million (£10 million at steady state) for the 'deduction' policy, and £52 million (£41 million at steady state) for 'Flat 20'. The large difference between initial and steady state cost under the 'Deduction' policy reflects the fact that it would mostly benefit high income Professionals, with the projected future increase in their wages following training being taxed at a high marginal rate.

**Table 34** By occupation- central scenario, modelled policy: Mix

<b>Occupation</b>	<b>Annual Exchequer cost of tax incentive (£ million)</b>	<b>% of total tax incentive value accruing to group</b>	<b>Tax incentive value per person in group (£)</b>	<b>Net cost to the Exchequer (£ million) - Year 5 and onwards (steady state)</b>
Managers, Directors And Senior Officials	£19	6%	£5.19	£11
Professional Occupations	£69	22%	£9.90	£46
Associate Professional And Technical Occupations	£35	11%	£7.12	£29
Administrative And Secretarial Occupations	£31	10%	£7.43	£26
Skilled Trades Occupations	£14	4%	£3.52	£10
Caring, Leisure And Other Service Occupations	£56	18%	£15.45	£48
Sales And Customer Service Occupations	£22	7%	£7.03	£22
Process, Plant And Machine Operatives	£5	2%	£1.98	£4
Elementary Occupations	£28	9%	£6.09	£27
Does not apply	£30	10%	£4.35	£30
<b>TOTAL</b>	<b>£309</b>	<b>100%</b>	<b>£6.97</b>	<b>£252</b>

**Table 35 By occupation- central scenario, modelled policy: Deduction**

<b>Occupation</b>	<b>Total training expenditure (£ million)</b>	<b>Annual Exchequer cost of tax incentive (£ million)</b>	<b>Net cost to the Exchequer (£ million) - Year 5 and onwards (steady state)</b>
Managers, Directors And Senior Officials	£75	£8	£0
Professional Occupations	£252	£33	£10
Associate Professional And Technical Occupations	£146	£11	£4
Administrative And Secretarial Occupations	£131	£9	£4
Skilled Trades Occupations	£55	£5	£1
Caring, Leisure And Other Service Occupations	£234	£15	£7
Sales And Customer Service Occupations	£99	£1	£1
Process, Plant And Machine Operatives	£20	£1	£1
Elementary Occupations	£125	£4	£3
Does not apply	£136	£1	£1
<b>TOTAL</b>	<b>£1,272</b>	<b>£87</b>	<b>£31</b>

**Table 36** By occupation- central scenario, modelled policy: Flat 20

<b>Occupation</b>	<b>Total training expenditure (£ million)</b>	<b>Annual Exchequer cost of tax incentive (£ million)</b>	<b>Net cost to the Exchequer (£ million) - Year 5 and onwards (steady state)</b>
Managers, Directors And Senior Officials	£77	£15	£12
Professional Occupations	£260	£52	£41
Associate Professional And Technical Occupations	£154	£31	£27
Administrative And Secretarial Occupations	£139	£28	£25
Skilled Trades Occupations	£58	£12	£10
Caring, Leisure And Other Service Occupations	£252	£50	£45
Sales And Customer Service Occupations	£108	£22	£22
Process, Plant And Machine Operatives	£21	£4	£4
Elementary Occupations	£138	£28	£27
Does not apply	£148	£30	£30
<b>TOTAL</b>	<b>£1,355</b>	<b>£271</b>	<b>£241</b>

**Table 37**  
**Mix**

**By occupation- No behaviour (pure deadweight) scenario, modelled policy:**

<b>Occupation</b>	<b>Annual cost of tax incentive (£ million)</b>	<b>% of total tax incentive value accruing to group</b>	<b>Tax incentive value per person in group</b>
Managers, Directors And Senior Officials	£17	6%	£4.77
Professional Occupations	£64	23%	£9.15
Associate Professional And Technical Occupations	£32	12%	£6.59
Administrative And Secretarial Occupations	£28	10%	£6.69
Skilled Trades Occupations	£12	4%	£3.15
Caring, Leisure And Other Service Occupations	£50	18%	£13.79
Sales And Customer Service Occupations	£20	7%	£6.44
Process, Plant And Machine Operatives	£4	2%	£1.74
Elementary Occupations	£25	9%	£5.38
Does not apply	£27	10%	£3.98
<b>TOTAL</b>	<b>£280</b>	<b>100%</b>	<b>£6.34</b>

## 5.6 Results by Sector

Table 38 By sector- descriptive statistics

Sector	Number of individuals	Number of eligible individuals	Eligible individuals undertaking self-funded work-related training in the past four weeks	P exp on (£
Agriculture, forestry and fishing	316,357	171,315	1,443	
Energy and water	549,757	510,911	2,076	
Manufacturing	3,001,108	2,768,220	12,585	
Construction	2,175,508	1,305,272	3,490	
Distribution, hotels and restaurants	5,591,296	4,535,734	23,487	
Transport and communication	2,756,833	2,259,589	9,387	
Banking and finance	5,113,680	4,062,368	31,162	
Public admin, education and health	9,148,988	8,494,977	82,581	
Other services	1,748,395	1,125,222	15,182	
Does not apply	13,734,076	11,319,402	135,462	
<b>TOTAL</b>	<b>44,135,998</b>	<b>36,553,010</b>	<b>316,855</b>	<b>£</b>
No answer	149,524	116,539		

Table 38 shows results by sector. Excluding spending by individuals who are not employed (mainly the unemployed and economically inactive), by far the highest expenditure on training is undertaken by employees in the Public Administration, Education and Health sector. Individuals in other categories spend the most per person (around £36), followed by employees in the Public Administration, Education and Health sector (around £34 per person), and a Banking and Finance (around £23 per person).

At the other end of the scale, individuals employed in Construction only spend around £8 per person, followed by individuals employed in Agriculture, Forestry and Fishing (around £13 per person). While this partly reflects the high prevalence of positions with low skill requirements in both sectors, it is still the case that Construction and Agriculture are amongst the sectors most affected by vacancy skills-shortages (see box 2).

The tables below show the projected impact of the different policies examined in increasing spending on training by individuals alongside the associated Exchequer cost. Given the low total training expenditure by individuals in the Agriculture sector (£5m), the Exchequer cost of introducing tax incentives for the sector would be very low (around £1) regardless of the policy examined. Tax incentives targeted solely at employees in the Construction sector would increase training expenditure by 10% under the 'Mix' policy, and would come at a cost to the Exchequer of £4 million ('Mix'), £1 million ('Deduction'), or £4 million ('Flat 20').

**Table 39** By sector- central scenario, modelled policy: Mix

<b>Sector</b>	<b>Total training expenditure (£ million)</b>	<b>Change in total training expenditure compared to no incentives (£ million)</b>	<b>% Change in total training expenditure compared to no incentives</b>	<b>Policy 'deadweight'</b>
Agriculture, forestry and fishing	£5	£1	14%	58%
Energy and water	£10	£1	10%	54%
Manufacturing	£49	£4	10%	64%
Construction	£18	£2	10%	65%
Distribution, hotels and restaurants	£102	£9	10%	59%
Transport and communication	£45	£4	10%	66%
Banking and finance	£126	£11	10%	63%
Public admin, education and health	£344	£32	10%	63%
Other services	£70	£7	11%	60%
Does not apply	£597	£51	9%	58%
<b>TOTAL</b>	<b>£1,365</b>	<b>£122</b>	<b>10%</b>	<b>61%</b>

**Table 40** By sector- central scenario, modelled policy: Mix

<b>Sector</b>	<b>Annual Exchequer cost of tax incentive (£ million)</b>	<b>% of total tax incentive value accruing to group</b>	<b>Tax incentive value per person in group (£)</b>	<b>Net cost to the Exchequer (£ million) - Year 5 and onwards (steady state)</b>
Agriculture, forestry and fishing	£1	0%	£4.12	£1
Energy and water	£2	1%	£3.59	£2
Manufacturing	£13	4%	£4.22	£4
Construction	£4	1%	£2.06	£2
Distribution, hotels and restaurants	£23	8%	£4.15	£20
Transport and communication	£12	4%	£4.29	£7
Banking and finance	£30	10%	£5.89	£22
Public admin, education and health	£86	28%	£9.41	£61
Other services	£17	6%	£9.99	£12
Does not apply	£119	39%	£8.69	£119
<b>TOTAL</b>	<b>£309</b>	<b>100%</b>	<b>£6.99</b>	<b>£252</b>

**Table 41** By sector- central scenario, modelled policy: Deduction

<b>Sector</b>	<b>Total training expenditure (£ million)</b>	<b>Annual Exchequer cost of tax incentive (£ million)</b>	<b>Net cost to the Exchequer (£ million) - Year 5 and onwards (steady state)</b>
Agriculture, forestry and fishing	£4	£1	£1
Energy and water	£9	£0	£0
Manufacturing	£46	£6	-£2
Construction	£17	£1	-£1
Distribution, hotels and restaurants	£95	£7	£4
Transport and communication	£44	£7	£2
Banking and finance	£119	£11	£4
Public admin, education and health	£324	£40	£15
Other services	£65	£6	£1
Does not apply	£549	£7	£7
<b>TOTAL</b>	<b>£1,272</b>	<b>£87</b>	<b>£31</b>

**Table 42** By sector- central scenario, modelled policy: Flat 20

<b>Sector</b>	<b>Total training expenditure (£ million)</b>	<b>Annual Exchequer cost of tax incentive (£ million)</b>	<b>Net cost to the Exchequer (£ million) - Year 5 and onwards (steady state)</b>
Agriculture, forestry and fishing	£4	£1	£1
Energy and water	£10	£2	£2
Manufacturing	£48	£10	£6
Construction	£18	£4	£3
Distribution, hotels and restaurants	£101	£20	£18
Transport and communication	£45	£9	£6
Banking and finance	£125	£25	£21
Public admin, education and health	£339	£68	£54
Other services	£69	£14	£12
Does not apply	£597	£119	£119
<b>TOTAL</b>	<b>£1,355</b>	<b>£271</b>	<b>£241</b>

**Table 43** By sector- No behaviour (pure deadweight) scenario, modelled policy: Mix

<b>Sector</b>	<b>Annual cost of tax incentive (£ million)</b>	<b>% of total tax incentive value accruing to group</b>	<b>Tax incentive value per person in group</b>
Agriculture, forestry and fishing	£1	0%	£3.61
Energy and water	£2	1%	£3.26
Manufacturing	£12	4%	£3.83
Construction	£4	1%	£1.85
Distribution, hotels and restaurants	£21	7%	£3.75
Transport and communication	£11	4%	£3.90
Banking and finance	£27	10%	£5.36
Public admin, education and health	£78	28%	£8.52
Other services	£16	6%	£8.99
Does not apply	£109	39%	£7.96
<b>TOTAL</b>	<b>£280</b>	<b>100%</b>	<b>£6.35</b>

## 5.7 Results by Individual Wage Income Quartile

The LFS only contains data on income from employment, rendering it impossible to analyse the distributional impact of the tax incentives we examine here, based on total household income from all sources. This is unfortunate, as the distributional impact of any proposed policy is a critical factor of assessing its desirability: to give an example, the HM Treasury Green book suggests that a given level of financial benefit flowing to the bottom income quintile is worth around 4 times more to society as a whole compared to the same financial benefit flowing to the top income quintile. This high value placed by society and government policy on redistribution further implies that even policies with high deadweight costs could be welfare enhancing if they divert resources to low-income households.

<b>Box 3 Illustrative distributional weights (household level)</b>		
<b>Income quintile</b>	<b>Range (Net)</b>	<b>Range (Gross)</b>
Bottom	1.9 - 2.0	2.2 - 2.3
2nd	1.3 - 1.4	1.4 - 1.5
3rd	0.9 - 1.0	1.0 - 1.1
4th	0.7 - 0.8	0.7 - 0.8
Top	0.4 - 0.5	0.4 - 0.5

*Source: HM Treasury Green Book*

This has significant implications for the analysis of tax incentives for self-funded work-related training by individuals, since low-skill individuals, the long-term unemployed, and certain occupational groups are much more likely to be in low income households compared to the general population. However, the lack of suitable data renders it impossible to arrive at reliable estimates of the implications this has for the policies examined in this report, and it is only possible to draw broad conclusions regarding their likely distributional impact.

The tables below present the results of a more limited analysis based only on the distribution of employment income amongst employees. Amongst this subgroup, it is interesting to note that the bottom quartile accounts for most of the spending on work-related training (37% of the total). This could reflect a number of factors: lower average age (and hence less work experience), a relatively larger number of people opting to (temporarily) work part-time/fewer hours to allow them more time for training, and possibly less access to employer-provided training.

As expected, the ‘Deduction’ policy – the impact of which critically depends on the trainees’ income – has a much lower impact in terms of incentivising training lower down the wage income scale compared to the ‘Flat 20’ policy, with the two policies estimated to increase spending on work-related training by individuals in the bottom quartile by 5% and 14% respectively. This picture is reversed at the other end of the income scale, with the ‘Deduction’ policy leading to a 9% increase compared to the 4% estimated increase under the ‘Flat 20’ policy.

Interestingly, for individuals at either the 2<sup>nd</sup> or 3<sup>rd</sup> income quartiles, the ‘Deduction’ policy is also much more effective in incentivising additional training, reflecting the fact that this analysis only covers the limited subsample of employees, who have on average higher incomes than the general population. In other words, it is likely that many of the individuals examined here would fall under a higher income quartile if this analysis included the entire UK population rather than the limited subsample examined here.

Table 46 shows the value of the tax incentive for the average individual within the quartile as a percentage of their spending on work-related training. Under the ‘Flat 20’ policy, all individuals benefit from an effective 20% deduction to their cost of training regardless of their income, but under the ‘deduction’ policy this becomes 47% for individuals in the top income quartile and 8% for individuals at the bottom quartile, directly reflecting the combined marginal income tax and NICS rate they face on their income.

**Table 44** By wage income quartile- Expenditure on work-related training as a percentage of total expenditure on work-related training (central scenario)

Wage income quartile	No incentives	Policy 1: Deduction	Policy 2: Flat 20	Policy 3: Mix
1 (lowest income)	36%	35%	38%	37%
2	16%	17%	16%	16%
3	26%	26%	25%	25%
4 (highest income)	22%	22%	21%	22%

**Table 45** By wage income quartile- percentage increase in expenditure on work-related training compared to expenditure in the absence of tax incentive (central scenario)

Wage income quartile	Policy 1: Deduction	Policy 2: Flat 20	Policy 3: Mix
1 (lowest income)	5%	14%	15%
2	17%	10%	17%
3	10%	6%	10%
4 (highest income)	9%	4%	9%

**Table 46 By wage income quartile- tax incentive as % of expenditure on work-related training (central scenario)**

Wage income quartile	Policy 1: Deduction	Policy 2: Flat 20	Policy 3: Mix
1 (lowest income)	8%	20%	22%
2	32%	20%	32%
3	32%	20%	32%
4 (highest income)	47%	20%	47%

Finally, table 47 shows the percentage of the total cost to the Exchequer that corresponds to providing tax incentives on self-funded work-related training for each of the wage income quartiles. Under the 'Flat 20' policy, the benefit to each group is directly proportional to the amount of training undertaken by individuals in each quartile, with 38% of the total outlay going to the bottom quartile and 21% to the top quartile. The 'deduction' policy on the other hand depends not only on the amount of training undertaken but also on the marginal tax rate faced by the individual undertaking training, and as a result individuals in the highest wage income quartile enjoy the lion's share of the total benefit (39% of the total), and those at the bottom quartile only 11%. The results presented here clearly demonstrate that, even for the limited population subgroup examined here, the 'Deduction' policy would be regressive and the 'Flat 20' policy progressive in terms of income redistribution, with the 'Mix' policy regressive<sup>46</sup> overall but less so than the 'Deduction' policy. While the data limitations discussed earlier prevent this analysis from covering the entire population of interest, given that the groups (mainly the unemployed and economically inactive) excluded from the analysis in this subsection are likely to have relatively lower incomes on average, the 'Deduction' policy is likely to be even more strongly regressive than shown here, and the 'Flat 20' policy more strongly progressive.

**Table 47 By wage income quartile- percentage of total tax incentive outlay accruing to each wage income quartile (central scenario)**

Wage income quartile	Policy 1: Deduction	Policy 2: Flat 20	Policy 3: Mix
1 (lowest income)	11%	38%	26%
2	20%	16%	16%
3	31%	25%	26%
4 (highest income)	39%	21%	32%

<sup>46</sup> A 'progressive' policy is defined as a policy that benefits lower income individuals relatively more than individuals earning higher incomes, while a 'regressive' policy does the opposite.

## 6 Conclusions and Recommendations

The evidence presented here illustrates that it may be possible for policy makers to use the tax system to increase investment in work-related skills. There are potential benefits for individuals, employers and society, while also supporting a number of related policy objectives for disadvantaged groups. Furthermore, tax incentives – already a feature of tax systems in a number of countries – could be an administratively efficient way for the government to further support investment in skills, while only having a limited cost to the Exchequer.

The simulations show that tax incentives could increase the amount of work-related training individuals invest in by 5%-25%, with the exact figure depending on the specific policy features and the modelling assumptions utilised. Crucially, even a wide-ranging system of incentives under pessimistic assumptions regarding the returns to training would carry a cost the Exchequer of significantly less than half a billion pounds a year. Under more optimistic (but still in line with findings in the literature) assumptions it could even generate a net gain to the Exchequer of over a billion pounds a year in the medium to long run.

Changes to the personal tax system could conceivably be introduced so that in addition to supporting productivity growth and general economic well-being, it can also contribute to other long-standing policy objectives. These include equality of opportunity, providing effective support for key groups of interest (e.g. the unemployed, those with low skills, and those on low incomes), and targeting skills shortages in specific sectors and occupations.

This report is a relatively high-level study of the feasibility of introducing tax incentives for individuals, and more work is needed to fully assess their likely impact and costs<sup>47</sup>, as well as to carefully examine policy design and delivery arrangements. That said, the evidence presented here supports the case that policy makers and analysts should further consider the most appropriate use of the personal tax system to incentivise individuals to invest more in work-related training, especially since this can help alleviate problems that are sometimes observed with provision of training by employers or the government<sup>48</sup>. Furthermore, in order to support wider policy aims on equity and equality of opportunity, tax incentives can be designed so as to also benefit low income individuals who pay little or no tax at the moment, for example via provision of a refundable tax credit.

The potential use of personal tax incentives to encourage individuals to invest in their work related skills could be trialled via specific groups. In this way potential implementation issues could be raised and addressed before any wider application of the approach. A staged roll-out of any such potential policy would also provide fertile ground for research and evaluation into the propensity of individuals to invest resources into their own personal and professional development. This report aims to make a useful and informed contribution to this debate.

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<sup>47</sup> The benefits of increased training to individuals, employers, and society as a whole potentially dwarf the cost to the Exchequer, and should be examined separately as part of a comprehensive Cost Benefit Analysis of introducing tax incentives. This report examines the *feasibility* rather than *desirability* of introducing tax incentives, hence the focus is mostly on the cost of tax incentives to the Exchequer rather than their wider benefits.

<sup>48</sup> For example, public provision of training is sometimes associated with excessive bureaucracy and limited flexibility, while targeted public support operating through employers can suffer from high deadweight (see, for example, Abramovsky et al (2011), especially in the case of larger employers. Employer-provided training is often firm-specific rather than bestowing more transferrable work-related skills, while it tends to be aimed more towards high-skilled individuals on relatively high incomes rather than individuals lower down the skill/income scale. None of the above constitute sufficient justification for scaling back support for employers or publicly provided training, but they raise the possibility of direct support for training by individuals acting as an effective corrective measure for some of the issues observed.

# Appendix A: Current UK Policy Summary: Income Tax, NICs, Tax Credits, Unemployment Benefits

## Income Tax, NICs, Tax Credits, Unemployment Benefits

Table A1 Taxable income

Income Tax Rates	Taxable Income / Profits for self-employed
0%	Up to £11,000 (Personal Allowance)
20%	£11,000 - £43,000
40%	£43,001 - £150,000
45%	Over £150,000

The personal Allowance goes down by £1 for every £2 income above £100,000. This means that the allowance is zero for income of £122,000 or above.

Different rules apply in terms of the personal allowance for individuals born before 6 April 1948.

Table A3 National insurance

Class 1 NICs thresholds	Earnings
Lower earnings limit (LEL)	£112 per week £486 per month £5,824 per year
Primary Threshold (PT)	£155 per week £672 per month £8,060 per year
Secondary Threshold (ST)	£156 per week £676 per month £8,112 per year
Upper earnings limit (UEL)	£827 per week £3,583 per month £43,000 per year

**Table A4 Class 1 NICs: rates for employee (primary) contributions**

<b>NICs category letter</b>	<b>Earnings at or above LEL up to and including PT</b>	<b>Earnings above the PT up to and including UAP</b>	<b>Earnings above UAP up to and including UEL</b>	<b>Balance of earnings above UEL</b>
A (Standard Rate)	0%	12%	12%	2%
B (Married women's and widow's reduced rate)	0%	5.85%	5.85%	2%
C (Over state pension age)	NIL	NIL	NIL	NIL
D (Contracted out - standard rate)	0%	10.60%	12%	2%
E (Contracted out – reduced rate)	0%	5.85%	5.85%	2%
J (Deferment)	0%	2%	2%	2%
L (Contracted out – deferment)	0%	2%	2%	2%

**Table A5 Class 1 NICs: rates for employer (secondary) contributions**

<b>NICs category letter</b>	<b>Earnings at or above LEL up to and including ST</b>	<b>Earnings above ST up to and including UAP</b>	<b>Earnings above UAP up to and including UEL</b>	<b>Balance of earnings above UEL</b>	<b>NICs rebate on earnings above LEL, up to and including ST</b>
A	0%	13.80%	13.80%	13.80%	N/A
B	0%	13.80%	13.80%	13.80%	N/A
C	0%	13.80%	13.80%	13.80%	N/A
D	0%	10.40%	13.80%	13.80%	3.40%
E	0%	10.40%	13.80%	13.80%	3.40%
J	0%	13.80%	13.80%	13.80%	N/A
L	0%	10.40%	13.80%	13.80%	3.40%

**Table A6 Class 2 and 4 NICs: For sole traders / self –employed**

Annual profits	Class 2	Class 4
Up to £5,965	£0 (only if you get a small earnings exception otherwise £2.80 a week)	£0
£5,965 to £8,060	£2.80 a week	£0
£8,060 to £43,000	£2.80 a week	9% of profits between £8,060 and £43,000
More than £43,000	£2.80 a week	9% of profits between £8,060 and £43,000 and 2% over that amount

## Tax Credits

### Child Tax Credit

People are eligible for CTC if they are responsible for a child aged 16 or under or aged 20 or under if they are in approved education.

**Table A7 Child tax credit: payment amounts**

Elements	Amount (Yearly)
Family element	£545
For each child (add on)	£2,780 (Max amount)
For each disabled child (add on)	£3,140 (Max amount)
For each severely disabled child (add on)	£1,275 (Max amount)

For annual household income above £16,105 CTC will be reduced by 41p for every £1 earned above the limit. For earnings of £20,000 the reduction is:  $(£20,000 - £16,105) \times 0.41$

### Working Tax Credits

People are eligible for WTC if they are between 16 and 24 and have a child and/or a disability or are over 25. To qualify they must work certain hours:

**Table A8 Working tax credits: eligibility criteria**

Circumstance	Hours a week
Aged 25 to 59	At least 30 hours
Aged 60 or over	At least 16 hours
Disabled	At least 16 hours
Single with 1 or more children	At least 16 hours
Couple with 1 or more children	Usually, at least 24 hours between you (with 1 of you working at least 16 hours)

**Table A9 Working tax credits: payment amounts**

Element	Amount
Basic amount	Up to £1,960 a year
You're a couple applying together	Up to £2,010 a year
You're a single parent	Up to £2,010 a year
You work at least 30 hours week	Up to £810 a year
You have a disability	Up to £2,970 a year
You have a severe disability	Up to £1,275 a year (usually on top of the disability payment)
You pay for <a href="#">approved childcare</a>	Up to £122.50 (1 child) or £210 (2 or more children) a week

For annual household income above £6,420 the maximum amount received is reduced by 41p for every pound of income over.

## Unemployment Benefits

Jobseeker's Allowance (JSA) is a benefit for people who are:

- unemployed (or work less than 16 hours), and
- are capable of working, and
- are looking for a job.

Currently there are two types of Jobseekers Allowance payments, contribution-based and income based.

If a person has paid enough Class 1 NICS in the 2 tax years before claiming he or she will get **contribution-based allowance**. This means that a person has either:

- worked for 26 weeks in one of these years earning at least the lower earnings limit for that tax year or
- paid class 1 contributions or received National Insurance credits in both of those tax years that amount to 50 times the lower earnings limit. In 2015/16 the lower earnings limit is £112 per week.

Contribution based allowance is paid for 6 months, if a person is unsuccessful in finding a job he or she might be able to receive income based allowance. The allowance is not means tested like the income based allowance but can be cut if a person has pension income above a certain level or earnings from part time work.

A person not eligible for the contribution based allowance may receive **income based allowance** if all of the following apply:

- 1) they work less than 16 hours per week on average
- 2) their partner (if they have one) works less than 24 hours per week on average
- 3) they have £16,000 or less in savings

As well as one of the following applying:

- 1) they have been paid less than £153 per week on average employed over the last 2 years,
- 2) they have been claiming contribution-based JSA for over 182 days and
- 3) they haven't worked over the last 2 years.

The income based allowance is means tested. The allowance is also lower if there is savings income.

**Table A10 Jobseeker's allowance**

<b>Age</b>	<b>JSA weekly amount</b>
18-24	Up to £57.90
25+	Up to £73.10
Couple (both aged 18+)	Up to £114.85

Please note that JSA is a taxable benefit.

## **Universal Credit (UC)**

The following benefits are in the process of being replaced by UC:

- Income-based Jobseeker's Allowance
- Income-related Employment and Support Allowance
- Income Support
- Working Tax Credit
- Child Tax Credit
- Housing Benefit

The aim of UC is to help those unemployed, those looking for work, those with low paid work or those that are sick and unable to work.

Currently a number of job centres are offering UC, with the last new claim to the legacy system expected to be accepted in 2017.

Unlike income-based JSA the benefit will not be cut if a person works more than 16 hours, but the amount of income (e.g. from work) will as before impact the amount paid out.

In line with CTC and WTC, universal credits (UC) are a combination of elements added together to form one benefit payment. The maximum amount of those elements is what a person would get if he or she did not work or did not have any capital. If a person has capital of £16,000 or more they are not entitled to UC.

**Table A11 Universal credits elements**

<b>Element</b>	<b>About</b>	<b>Max amount (month)</b>
Standard allowance		Single aged under 25 £251.77
		Single aged 25+ £317.82
		Couple both aged under 25 £395.20
		Couple either aged 25 + £498.89
Child element	A standard element for a child (under 16) or young person if in <b>education</b> (under 20)	First child/young person £277.08
		Second or subs. child/young person £231.67
Disabled child element	An element for a disabled child; the amount depends on severity of disability	Lower rate £126.11 Higher rate £367.92
Housing cost element	a housing costs element is included in a maximum amount if: <ul style="list-style-type: none"> <li>• you occupy it as your home</li> <li>• you're liable to pay housing costs for your accommodation</li> </ul>	Amount varies but UC has a benefits cap that will lower the housing cost element if it breaches the cap.
Limited capability element	If sick or disabled and have limited capability to either work or do work-related activity (higher)	£126.11 (work element) £315.60 (work-related activity element)
Childcare cost element	Available if certain work and childcare requirements are met.	85 per cent of childcare costs. Max £732.29 for one child £912.5 for two or more
Carer element	Available if having caring responsibilities for a severely disabled person.	£150.39

### **Work Allowance**

The work allowance applies regardless of whether earnings are from employment or self-employment. There is a higher work allowance and a lower work allowance, depending on whether the maximum amount includes housing costs. Work allowance includes pension income, savings income and other types of benefits

If earned income is the same as or less than the work allowance, all earned income will be ignored.

If earned income is higher than work allowance, a certain amount will be deducted from maximum allowance. Reduction of 65 pence of UC for every pound of earnings more than work allowance.

**Table A12 Higher work allowance - if you don't have a housing costs element**

Type of claimant	Your circumstances	Amount
Single claimant	Not responsible for a child or young person	£111
	Responsible for one or more children or young people	£734
	With limited capability for work	£647
Couple	Neither of you is responsible for a child or young person	£111
	Responsible for one or more children or young people	£536
	One or both of you has limited capability for work	£647

**Table A13 Lower work allowance - if you have a housing costs element**

Type of claimant	Your circumstances	Amount
Single claimant	Not responsible for a child or young person	£111
	Responsible for one or more children or young people	£263
	With limited capability for work	£192
Couple	Not responsible for a child or young person	£111
	Responsible for one or more children or young people	£222
	One or both of you has limited capability for work	£192

**Table A14 Work allowance example**

You're a single person with no children and no housing costs element	You're married with one child and a housing costs element
<p>Your earnings = £100 a month            Your work allowance = £111 a month            Your earnings are £11 less a month than your work allowance. Nothing is deducted from your maximum amount.</p>	<p>Your earnings = £422 a month            Your work allowance = £222 a month            Your earnings are £200 more than your work allowance. 65% of £200 = £130            £130 is deducted from your maximum amount.</p>

## **Benefit Cap**

There's a limit on the total amount of benefit that most people aged 16 to 64 can get. This is called the benefit cap.

The cap applies to the total amount that the people in your household get from the following benefits:

- Bereavement Allowance
- Carer's Allowance
- Child Benefit
- Child Tax Credit
- Employment and Support Allowance (unless you get the support component)
- Guardian's Allowance
- Housing Benefit
- Incapacity Benefit
- Income Support
- Jobseeker's Allowance
- Maternity Allowance
- Severe Disablement Allowance
- Widowed Parent's Allowance (or Widowed Mother's Allowance or Widows Pension you started getting before 9 April 2001)

The level of the cap is:

- £500 a week for couples (with or without children living with them)
- £500 a week for single parents whose children live with them
- £350 a week for single adults who don't have children, or whose children don't live with them

## Appendix B: Data Sources

### Labour Force Survey (LFS)

The Labour Force Survey (LFS) is the largest household survey in the UK providing a unique source of information on the employment circumstances of the UK population. It uses international definitions of employment, unemployment and economic inactivity, and records a wide range of individual characteristics such as occupation, incidence and intensity of work-related training, income from employment, and other personal characteristics of interviewed household members.

The LFS was at first conducted every two years from 1973-1983 and afterwards annually from 1984-1991. From 1992 quarterly data were made available, and the survey then became known as the Quarterly Labour Force Survey (QLFS). In accordance with EU regulations, the LFS moved from seasonal (spring, summer, autumn, winter) quarters to calendar quarters (January-March, April-June, July-September, October-December) in 2006.

The QLFS questionnaire comprises a 'core' of questions which are included in every survey, together with some 'non-core' questions which vary from quarter to quarter. The questionnaire can be split into two main parts. The first part contains questions on the respondent's household, family structure, basic housing information and demographic details of household members. The second part contains questions covering economic activity, education and health, and may also include questions asked on behalf of other government departments (for example the Department for Work and Pensions and the Home Office). Since 1993, detailed questions on income have also been included in each quarter. The basic questionnaire is revised each year, and a new version published, along with a transitional version that details changes from the previous year's questionnaire.

Detailed information about the LFS can be found at:

<http://www.ons.gov.uk/ons/guide-method/method-quality/specific/labour-market/labour-market-statistics/index.html>

## **UK Commission's Employer Skills Survey (UKESS)**

The UK Commission for Employment and Skills' (UKCES) Employer Skills Survey is a biennial UK-wide individual establishment telephone survey, providing the most detailed picture of training, vacancies, skills gaps, and investment in training. The aims are to provide rigorous and robust intelligence on the UK labour market and the market for skills. The survey has two waves, with a mainstage questionnaire of c.91.000 establishments, and a follow-up survey of investment in training of c.13.000 establishments that have conducted training over the previous 12 months.

The main topics of the survey include establishment characteristics, recruitment, vacancies, demand for skills and skills gaps, hard-to-fill vacancies, workforce development and training, skills utilization and high performance working, business strategy and structure.

Detailed information about the UK Commission's Employer Skills Survey 2015 can be found at:

<https://www.gov.uk/government/collections/ukces-employer-skills-survey-2015>

## **National Institute of Adult Continuing Education (NIACE) Survey**

NIACE has been conducting this annual survey since 1996. Each year, 5,000 adults aged 17 and over across the UK are asked when they last took part in any learning, as well as how likely they are to take part in learning during the next three years. The survey adopts a broad definition of learning, including a wide range of formal, non-formal and informal learning.

Detailed information about the NIACE survey can be found at:

<http://www.niace.org.uk/niace-adult-participation-in-learning-surveys>

## **National Adult Learning Survey (NALS)**

In 1997 the former Department for Education and Employment (DfEE) commissioned the first National Adult Learning Survey (NALS 1997), which explored participation in a wide range of learning activities. This was followed by repeat surveys in 2000, 2001, 2002, 2005, 2007 and 2010. The NALS series is used by the Department for Education and Skills (DfES) to monitor the effectiveness of their adult learning policies and progress in meeting the National Learning Target for adult participation.

The dataset includes information on individuals' experience of full time continuous education and highest qualification achieved, alongside details of 'other' self-directed learning, future learning plans, and awareness of learning initiatives amongst other topics.

Detailed information about the NALS survey can be found at:

<https://www.gov.uk/government/publications/national-adult-learner-survey-2010>

### **Adult Education Survey (AES)**

The Adult Education Survey (AES) is part of the European Union (EU) statistics on education and lifelong learning. It is a household survey which is part of the EU Statistics on lifelong learning. People living in private households are interviewed about their participation in education and training activities (formal, non-formal and informal learning). The first wave of the survey was carried out in 2007 and afterwards it takes place every five years and its results are published on Eurostat website. The target population of the survey is composed of people aged 25 to 64 and it have been carried out by 29 countries in the EU, European Free Trade Association (EFTA) and candidate countries. The EU AES is a pilot exercise which for the first time proposed a common framework including a standard questionnaire, tools and quality reporting. In Great Britain, AES was conducted within the existing National Adult Learning Survey (NALS) series.

Detailed information about the AES survey can be found at:

[http://ec.europa.eu/eurostat/web/microdata/adult\\_education\\_survey](http://ec.europa.eu/eurostat/web/microdata/adult_education_survey)

## Bibliography

- Abramovsky, L., Battistin, E., Fitzsimons, E., Goodman, A. And H. Simpson (2011) *Providing Employers with Incentives to Train Low-Skilled Employees: Evidence from the UK Employer Training Pilots* Journal of Labor Economics, Vol 29, pp. 153-192.
- Access Economics (2004) *Future demand for vocational education and training* Department of Education, Science and Training, Canberra.
- Acemoglu, D. and J.-S. Pischke (1999) *Beyond Becker: Training in imperfect labor markets* Economic Journal 109, F112–F142.
- Addison, J.T. and C.R. Belfield (2008) *Unions, training and firm performance* IZA Discussion Paper, IZA.
- Albert, C., Garcia-Serrano, C.,and Hernanz, V. (2010) *On-the-job training in Europe: Determinants and wage returns* International Labour Review, 149, 315–341.
- Aldridge, F. And D. Hughes (2013) *Adult Participation in Learning Survey* National Institute of Adult Continuing Education.
- Almeida, R. and P. Carneiro (2006) *Costs, benefits and the internal rate of return to firm provided training* The World Bank Policy Research Working Paper Series.
- Almeida, R. And P. Carneiro (2009) *The return to the firm investment in human capital* Labour Economics 16 vol 1, pp. 97-106.
- Almeida-Santos, F. and K. Mumford (2010) *Employee training and wage dispersion: White and blue collar workers in Britain* IZA Discussion Papers, IZA.
- Arriagada, A.-M. (1990) *Labor Market Outcomes of Non-Formal Training for Male and Female Workers in Peru* Economics of Education Review 9(4): 331-342.
- Arulampalam, W. and A. Booth (2001) *Learning and earning: Do multiple training events pay? A decade of evidence from a cohort of young British men* Economica, 68, pp. 379-400.
- Arulampalam, W., Booth, A. and M. Bryan (2004) *Are There Asymmetries in the Effects of Training on the Conditional Male Wage Distribution?* IZA Discussion Paper, No. 984.
- Asplund, R. (2004) *The Provision and Effects of Company Training: A brief review of the literature* ETLA Discussion Paper no. 907.
- Barrett, A. and O'connell, P. (2001) *Does training generally work? The returns to in-company training* Industrial and Labour Relations Review, 54(3) 647-683.

- Barnes, L. (2011) *Education and Training* National Statistics, Social Trends 41, ISSN 2040–1620.
- Bartel, A.P. (1992) *Training, wage growth and job performance: evidence from a company database* NBER Working Paper series. Cambridge, MA, National Bureau of Economic Research.
- Bartel, A.P. (2000) *Measuring the employer's return on investments in training Evidence from the literature*, *Industrial Relations*, 39, pp. 502–524.
- Bassanini A. and S. Martin (2004) *Training, Wages and Employment Security: an Empirical Analysis for 13 European Countries* Communication au congrès de l'AFSE, Paris.
- Bassanini, A. and G. Brunello (2008) *Is training more frequent when the wage premium is smaller? Evidence from the European community household panel*, *Labour Economics* 15: 272-290.
- Bassanini, A. and W. Ok (2003) *How do firms and individuals incentive to invest in human capital vary across groups?* Working paper.
- Bassanini, A. (2004) *Improving Skills for More and Better Jobs: Does Training Make a Difference?* OECD Working Paper, Paris.
- Bassanini, A., Booth, A., Brunello, G., De Paola, M. and E. Leuven (eds) (2006) *Workplace training in Europe* forthcoming in: Brunello,G., P.Garibaldi and E.Wasmer, *Education and Training in Europe*, Oxford University Press, 2006 (also IZA Discussion Paper n.1640).
- Beyer de, J. (1990) *The incidence and impact on earnings of formal training provided by enterprises in Kenya and Tanzania*, *Economics of Education Review* 9(4): 321-330.
- Biesebroeck van, J. (2007) *Wage and productivity premiums in sub-Saharan Africa* NBER Working paper series. Cambridge, MA, National Bureau of Economic Research.
- Blau, D.M. and P.K. Robins (1985) *Communications, training programs and wages. A general equilibrium analysis of the effects of program size* *The Journal of Human Resources* XXII(1): 113-125.
- Blundell, R., Dearden, L., Meghir, C., and B. Sianesi (1999) *Human Capital Investment: The Returns from Education and Training to the Individual, the Firm, and the Economy* *Fiscal Studies*, 20.1, 1-23
- Blundell, R., Dearden, L. and Meghir, C. (1999) *The Determinants of Work Related Training in Britain* London: Institute of Fiscal Studies.
- Boateng, S.K. (2009) *Significant Country Differences in Adult Learning* Luxembourg: Eurostat.

- Booth, A. L. and Bryan, M. L. (2005) *Testing some predictions of human capital theory: New training evidence from Britain* The Review of Economics and Statistics, 87(2), 391-394.
- Booth, A., Francesconi M. and G. Zoega (2003) *Unions, Work-Related Training, and Wages: Evidence for British Men* Industrial & Labor Relations Review 57(1), 68–91.
- Booth, A.L. (1991) *Job-related formal training: who receives it and what is it worth?* Oxford Bulletin of Economics and Statistics 53(3): 281-294.
- Bovenberg, L. and B. Jacobs (2005) *Redistribution and Education Subsidies are Siamese Twins* Tinbergen Institute Discussion Paper, No. 05-036/3.
- Brunello, G. and De Paola, M. (2004) *Training and the density of economic activity: evidence from Italy* IZA working papers n. 1173.
- Brunello, G. and A. Medio (2001) *An Explanation of International Differences in Education and Workplace Training* European Economic Review, vol.1, pp.307- 322.
- Brys, B. and C. Torres (2013) *Effective Personal Tax Rates on Marginal Skills Investments in OECD Countries: A New Methodology* OECD Taxation Working Papers, No. 16, OECD Publishing.
- Budria, S. and P. Pereira (2007) *The wage effects of training in Portugal: Differences across skill groups, genders, sectors and training types* Applied Economics, 39(4), pp. 787–807.
- Budria, S. and P.T. Pereira (2004) *On the returns to training in Portugal* IZA Discussion papers, IZA.
- Carneiro, P., K. Hansen, and J. J. Heckman (2001) *Removing the Veil of Ignorance in Assessing the Distributional Impacts of Social Policies* Swedish Economic Policy Review, 8(2):273- 301.
- Carneiro, P., K. Hansen, and J. J. Heckman (2003) *Estimating distributions of treatment effects with an application to the returns to schooling and measurement of the effects of uncertainty on college choice* International Economic Review 44(2), pp. 361p-422.
- Carneiro, P. and J. J. Heckman (2003) *Human Capital Policy* in James J. Heckman and Alan B. Krueger (eds.), *Inequality in America: What Role for Human Capital Policy?* Cambridge, MA: MIT Press, 77-240.
- Chapman, B., Crossley, T.F., and Kim, T. (2003) *Credit constraints and training after job loss* Centre of Economic Policy Research Discussion Paper 466, Australian National University.

- CEDEFOP (2009) *Using Tax Incentives to Promote Education and Training* Cedefop, Thessaloniki.
- Cohen-Goldner, S. and Eckstein, Z. (2010) *Estimating the return to training and occupational experience: The case of female immigrants* *Journal of Econometrics*, 156, 86-105.
- Collins, K.A. and J.B. Davies (2004) *Measuring Effective Tax Rates on Human Capital: Methodology and an Application to Canada* in Peter Birch Sorensen (ed.), *Measuring the Tax Burden on Capital and Labor*, MIT press, Cambridge, Mass. pp. 171-211.
- Constable, S. and Manson K. (2012) *UK Commission's Employer Skills Survey 2011: Technical Report*. Evidence Report 63. UK Commission for Employment and Skills, Wath-upon-Deerne. Available: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/303483/evidence-report-63-uk-ess-2011-technical-report.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/303483/evidence-report-63-uk-ess-2011-technical-report.pdf)
- Crawford, C., Crawford, R. and Jin, W. (2014) *Estimating the Public Cost of Student Loans* IFS Report to Universities UK, London: Institute for Fiscal Studies.
- Cunha, F., J. J. Heckman, and S. Navarro (2005) *Separating uncertainty from heterogeneity in life cycle earnings, the 2004 Hicks Lecture* *Oxford Economic Papers* 57(2), pp.191-261.
- Cunha, F., J. J. Heckman, L. J. Lochner, and D. V. Masterov (2006) *Interpreting the evidence on life cycle skill formation* In E. A. Hanushek and F. Welch (Eds.), *Handbook of the Economics of Education*. Amsterdam: North-Holland, forthcoming.
- Dearden, L. and C. Meghir (1996) *The Determinants and Effects of Work-Related Training in Britain*, London: Institute for Fiscal Studies.
- Dearden, L., L. McGranahan, and B. Sianesi (2004) *The Role of Credit Constraints in Educational Choices: Evidence from NCDS and BCS 70* Centre for the Economics of Education, Working Paper, 48.
- Dearden, L., Reed H. and J. Van Reenen (2000) *Who gains when workers train? Training and corporate productivity in a panel of British industries* Centre for Economic Policy Research Discussion, Paper No. 2486.
- Department for Business Innovation and Skills (2014) *Further Education & Skills: Learner Participation, Outcomes and Level of Highest Qualification Held* [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/416527/SFR\\_commentary\\_March\\_2015\\_FINAL.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/416527/SFR_commentary_March_2015_FINAL.pdf)
- Doerr, A., B. Fitzenberger, T. Kruppe, M. Paul, and A. Strittmatter (2014) *Employment and Earnings Effects of Awarding Training Vouchers* Working Paper.

- European Centre for the Development of Vocational Training (2009) *Using Tax Incentives to Promote Education and Training: Cedefop PANORAMA Series 2009*.
- Evans, C. (2003) *Studying the Studies: An overview of recent research into taxation operating costs* Journal of Tax Research, 1, 64–92.
- Evertsson, M. (2004) *Formal On-the-Job Training: A Gender-Typed Experience and Wage-Related Advantage* European Sociological Review, Vol. 20, No. 1, pp. 79-94.
- Fouarge, D., Schils, T. and A. De Grip (2010) *Why Do Low-Educated Workers Invest Less in Further Training?* Discussion paper series, Forschungsinstitut zur Zukunft der Arbeit, No. 5180.
- Fredland, J.E. and R.D. Little (1981) *Self-employed workers: returns to education and training* Economics of Education Review 1(3): 315-337.
- Fuente, A. and J.F. Jimeno (2005) *The Private and Fiscal Returns to Schooling and the Effect of Public Policies on Private Incentives to Invest in Education: A General Framework and Some Results for the EU* CESifo Working Paper No. 1392.
- Gasskov, V. (2001) *Government Interventions In Private Financing Of Training* ILO, Geneva.
- Gerfin, M. (2003) *Work-related training and wages - an empirical analysis for male workers in Switzerland* Mimeo, Volkswirtschaftliches Institut, Universität Bern.
- Gibson, J. (2003) *Do lower expected wage benefits explain ethnic gaps in job-related training?* Evidence from New Zealand: Motu working paper 2003-03.
- Gielen, A. C. (2007) *Performance pay, training and labor mobility* IZA Discussion paper, IZA.
- Gordon, K. and H. Tchinguirian (1998) *Marginal Effective Tax Rates on Physical, Human and R&D Capital* OECD Working Paper No. ECO/WKP(98)12, Paris: OECD.
- Görlitz, K. (2009) *The Effect of Subsidizing Continuous Training Investments - Evidence from German Establishment Data* Ruhr Economic Papers 144.
- Greenhalgh, C. (2002) *Adult Vocational Training in France and Britain* Fiscal Studies, vol 23, no. 2, pp. 223-263.
- Groot, W. (1995) *The wage effects of investments in enterprise-related-training* Empirical Economics 20: 133-147.
- Haelermans, C. and L. Borghans (2012) *Wage effects of on-the-job training: A meta-analysis* British Journal of Industrial Relations, 50:502–528.
- Hamil-Luker, J. (2005) *Women's wages: cohort differences in returns to education and training over time* Social Science Quarterly, Supplement to Volume 86, 1261-1278.

- Heckman, J. J. and B. Jacobs (2011) *Policies to create and destroy human capital in Europe, in Perspectives on the Performance on the Continent's Economies* E. Phelps and H.-W. Sinn, eds., pp. 253–323. Cambridge, MA: MIT Press.
- Heckman, J., Lochner L. and C. Taber (1998) *Tax Policy and Human Capital Formation* American Economic Review, 88, no.2: 293-297.
- Hidalgo, D., Oosterbeek, H., and Webbink, D. (2011) *The impact of training vouchers on low-skilled workers* In progress.
- Hill, E.T.(1995) *Labor market effects of women's post-school-age training* Industrial and Labor Relations Review 49(1): 138-149.
- HM Treasury (2014) *Autumn Statement Policy Costings*  
[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/382327/44695\\_Accessible.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/382327/44695_Accessible.pdf)
- Hoeckel, K. (2007) *Key evidence on vocational education and training policy from previous OECD work* EDU/EDPC/CERI, 6, ANN1.
- Hoffman, M.and S. Burks (2014) *Training Contracts, Worker Overconfidence, and the Provision of Firm Sponsored General Training* Mimeo, University of Toronto.
- Hui, S. and J. Smith (2001) *The Determinants of Participation in Adult Education and Training in Canada*.
- Jacobs, B. and L. Bovenberg (2008) *Optimal taxation of human capital and the earnings function* CESifo Working Paper No. 2250.
- Jacobs, B. (2002) *Optimal Income Taxation with Endogenous Human Capital* Tinbergen Institute, Discussion Paper, No. 02-045/2.
- Jacobs, B. (2007) *Optimal Tax and Education Policies and Investments in Human Capital* in: Hartog, Joop, and Henriette Maassen van den Brink, *Human Capital: Moving the Frontier*, Cambridge: Cambridge University Press, 212-232.
- Jacobs, B. (2005) *Optimal Income Taxation with Endogenous Human Capital* Journal of Public Economic Theory, 7, (2), pp. 295-315.
- Jenkins, A., Vignoles, A., Wolf, A.,and F. Galindo-Rueda (2002) *The Determinants of Effects of Lifelong Learning* CEE Discussion Paper 19, London: Centre for the Economics of Education, London School of Economics.
- Kahyarara, G. and Teal, F. (2008) *The returns to vocational training and academic education: Evidence from Tanzania* World Development, 36(11), 2223-2242.
- Kawaguchi, D. (2006) *The incidence and effect of job training among Japanese women* Industrial Relations 45(3): 469-477.

- Kennedy, S., and Harari, D. (2011) *Job centre Plus Flexible Support Fund Social Policy and Economic Policy & Statistics Sections*, House of Commons.
- Krueger, A. and C. Rouse (1998) *The effect of workplace education on earnings, turnover and job performance* *Journal of Labor Economics* 16(1): 61-94.
- Kuckulenz, A. and T. Zwick (2003) *The impact of training on earnings-differences between participant group and training forms* ZEW Discussion Papers, ZEW Discussion paper.
- LaLumia, S. (2012) *Tax Preferences for Higher Education and Adult College Enrollment* *National Tax Journal* 65 (1): 59–90.
- Lee, D. (2009) *Training, Wages, and Sample Selection: Estimating Sharp Bounds on Treatment Effects* *Review of Economic Studies*, 76(3): 1071–1102.
- Leslie, L., and P. Brinkman (1987) *Student Price Response in Higher Education: The Student Demand Studies* *Journal of Higher Education* 58(2), 181–204.
- Leuven, E. and H. Oosterbeek (2008) *An alternative approach to estimate the wage returns to private-sector training* *Journal of Applied Econometrics* 4: 423-434.
- Leuven, E. and Oosterbeek H. (1999) *The Demand and Supply of Work-Related Training: Evidence from Four Countries* in Polacheck S. and J. Robst (eds), *Research in Labor Economics*, 18, pp. 303-330.
- Leuven, E. and Oosterbeek H. (2002) *A New Approach to Estimate the Wage Returns to Work Related Training* IZA Discussion Paper No. 526.
- Leuven, E. and Oosterbeek, H. (2004) *Evaluating the effects of a tax deduction on training* *Journal of Labor Economics*, 22(2):461-488.
- Leuven, E. (2004) *A Review of the Wage Returns to Private Sector Training* Seminar Paper for the joint EC-OECD Seminar on Human Capital and Labour Market Performance, Brussels.
- Leuven, E., and Oosterbeek, H. (2007) *The responsiveness of training participation to tax deductibility* Unpublished working paper.
- Long, M. (2003) *Stabilization and fossilization in interlanguage development* In Catherine Doughty & Michael Long eds. *The Handbook of Second Language Acquisition* 487-536. Oxford: Blackwell
- Lochner, L. and A. Monge-Naranjo (2004) *The Nature of Credit Constraints and Human Capital* *American Economic Review* 101(6), pp. 2487–2529.
- Maes, M. (2004) *Vocational Educational and Training in the Netherlands* Short Description, Luxembourg: Dedefop.

- Marcotte, D.E. (2000) *Continuing education job training and the growth of earnings inequality* Industrial and Labor Relations Review 53(4): 602-623.
- Mauratos, P. (2014) *Statistical First Release, Further Education & Skills: Learner Participation Outcomes and Level of Highest Qualification Held*, National Statistics, Skills Funding Agency, Department for Business, Innovation and Skills.
- McIntosh S. and Garrett R. (2009) *The Economic Value of Intermediate Vocational Education and Qualifications* UKCES Evidence Report 11, London: UK Commission for Employment and Skills.
- Melero, E. (2004) *Evidence on training and career paths: Human capital, information and incentives* IZA Discussion papers, IZA.
- Messer, D. and S. Wolter (2009) *Money matters: Evidence from a Large-Scale Randomized Field Experiment with Vouchers for Adult Training* IZA DP No. 4017.
- Metcalf, R. and P.J. Sloane (2007) *Human capital spillovers and economic performance in the workplace in 2004: some British evidence*, IZA Discussion papers, IZA.
- Mincer, J. (1996) *Economic development, growth of human capital, and the dynamics of the wage structure* Journal of Economic Growth, 1(1), 29-48.
- Mirrlees, A. (ed.) (2011) *Tax By Design: The Mirrlees Review* Institute for Fiscal Studies, Oxford University Press, Oxford, pp.310-311.
- OBR (2013) *Economic and fiscal outlook* December 2013.  
<http://cdn.budgetresponsibility.independent.gov.uk/Economic-and-fiscal-outlook-December-2013.pdf>
- OECD (2004), *Career Guidance and Public Policy: Bridging the Gap*, Paris, OECD Publishing.
- OECD (2011) *Education at a Glance 2011: OECD Indicators*, OECD Publishing.
- Office for National Statistics (2014) *Young People in the Labour Market*.
- OTS (2014) *Review of Employees Benefits and Expenses* Office for Tax Simplification  
[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/339496/OTS\\_review\\_of\\_employee\\_benefits\\_and\\_expenses\\_final\\_report.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/339496/OTS_review_of_employee_benefits_and_expenses_final_report.pdf)
- Oosterbeek, H. (2013) *The financing of adult learning* EENEE Analytical Report 15.
- Oosterbeek, H., and Patrinos, H. A. (2008) *Financing lifelong learning* Policy Research Working Paper 4569, The World Bank.
- Paturot, D., Mellbye, K. and B. Brys (2013) *Average Personal Income Tax Rate and Tax Wedge Progression in OECD Countries* OECD Taxation Working Papers, No. 15, OECD Publishing.

- Pfeifer C, Janssen, S., Yang, P. and U. Backes-Gellner (2011) *Effects of training on employee suggestions and promotions in an internal labor market* IZA Discussion Paper No. 5671.
- Pontz, B. (2003) *Beyond rhetoric: Adult learning policies and practices* Paris: Organization for Economic and Cooperative Development.
- Reed, H. (2011) *Tax relief on Training. Investigating the Options for Reform* Union learn for Trades Union Congress Policy Development.
- Rosholm, M., Skyt Nielsen, H. and A. Dabalén (2007) *Evaluation of training in African enterprises* Journal of Development Economics 84(1): 310-329.
- Salas-Velasco, M. (2009) *Beyond lectures and tutorials: Formal on-the-job training received by young European university graduates* Research in Economics, 63, 200-211.
- Schone, P. (2004) *Firm-financed training: firm specific or general skills?* Empirical Economics 29: 885-900.
- Schrimpf, P. (2005) *An Empirical Study of the Effect of Progressive Taxes on Education.*
- Schuller, T. and Watson, D. (2009) *Learning through life: Inquiry into the future for lifelong learning.* Leicester, UK: NIACE.
- Schwerdt, G., D. Messer, L. Woessmann, and S. Wolter (2011) *Effects of Adult Education Vouchers on the Labor Market: Evidence from a Randomized Field Experiment* IZA Discussion Papers 5431.
- Shaw, J., Slemrod, J. and J. Whiting (2012) *Administration and Compliance* Chapter 12 Mirrless Review, IFS.
- Smith, A. and S. Billett (2003) *Making employers pay: how do they do it overseas?* The sixth Australian VET Research Association Conference, The Changing Face of VET, Australian Technology Park, Sydney.
- Tan, H., Savchenko, Y., Gimpelson, V., Kapelyushnikov, R. and Lukyanova, A. (2007) *Skills shortage and training in Russian enterprises* IZA Discussion paper, IZA.
- Torres, C. (2012) *Taxes and Investment in Skills* OECD Taxation Working Papers, No. 13, OECD Publishing.
- Townsend, J. (1996) *Price and consumption of tobacco* Br Med Bull. 1996; 52:132–142.
- Turner, N. (2010) *Why Don't Taxpayers Maximize their Tax-Based Student Aid Awards? Salience, Inertia, and Tax Evasion in Tax-Based Aid Selection*, Working paper.
- Turner, N. (2011) *The Effect of Tax-Based Federal Student Aid On College Enrollment* National Tax Journal, 64 (3), pp. 839–862.

- Turner, N. (2012) *Who Benefits from Student Aid: The Economic Incidence of Tax Based Aid* *Economics of Education Review* 31, pp. 463-81.
- UKCES (2009) *Employee Demand for Skills: A Review of Evidence & Policy* UKCES Evidence Report 3, UK Commission for Employment and Skills, London.
- UKCES (2009) *Employee Demand for Skills: A Review of Evidence & Policy* UKCES Executive Summary 3, UK Commission for Employment and Skills, London.
- UKCES (2014) *Growth through people, UKCES strategy 2014-17 and business plan 2014-15, Version 1.3.* UK Commission for Employment and Skills, London.
- UKCES (2014) *UK Commission's Employer Skills Survey 2013: Technical Report.* Evidence Report 82. UK Commission for Employment and Skills, Wath-upon-Deane. Available: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/303497/ukces-employer-skills-survey-13-technical-report.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/303497/ukces-employer-skills-survey-13-technical-report.pdf)
- UKCES (2016) *UK Commission's Employer Skills Survey 2015: Technical Report.* UK Commission for Employment and Skills
- Unionlearn (2011) *Tax Relief on Training: Investigating the Options for Reform*, London.
- Vignoles, A., F. Galindo-Rueda and L. Feinstein (2004) *The labour market impact of adult education and training: a cohort analysis* *Scottish Journal of Political Economy* 51(2): 266-280.
- Whitehead, N. (2013) *Review of adult vocational qualifications in England* Wath-upon-Deane: UK Commission for Employment and Skills.
- Williams, J., McNair, S. and Aldridge, F. (2010) *Expenditure and Funding Models in Lifelong Learning* Leicester: NIACE.
- Wößmann L., and Schütz G. (2006) *Efficiency and Equity in European Education and Training Systems: Analytical Report for the European Commission* Munich: European Expert Network on Economics of Education.
- Xiao, J. (2002) *Determinants of salary growth in Shenzhen, China: An analysis of formal education, on-the-job training and adult education with a three-level model* *Economics of Education Review* 21: 557-577.
- Yoshida, Y. and M.R. Smith (2005) *Training and earnings of immigrant males: Evidence from the Canadian workplace and employee survey* *Social Science Quarterly Supplement to Volume 86*: 1218- 1241.