

# **The Net Benefits to Employers' Investments in Apprenticeships: Case study evidence from the UK<sup>1</sup>**

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## **Abstract**

In a flexible labour market where people can move relatively easily between jobs and employers, there can be disincentives to train. Employers will be reluctant to train if they are, other things being equal, unsure about the extent to which they will be able to recoup their training costs. In the UK, public policy is committed to increasing the number of people completing apprenticeships in recognition of the benefits this form of training confers on both employers and individual apprentices. Considerable efforts are being made by the public agencies responsible for apprenticeships to persuade employers to participate in this form of training by persuading them of the benefits of doing so. Based on a limited number of employer case studies, this paper outlines the net costs borne by employers in training apprentices and the period over which these costs are recouped by the employer. It demonstrates that employers are able to recoup their costs over one to two years in many instances.

## **Introduction**

The UK vocational education and training system (VET) might be described as a voluntary one insofar as there are relatively few occupations in which a

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particular qualification or certificate is required to practise.<sup>2</sup> This provides employers and individuals with a relatively greater degree of choice about whether to engage in training compared with countries where there is, for instance, more of a *de facto* licence to practise in many occupations. In Germany, for example, it is inconceivable in many industrial sectors and occupations that anyone would be employed without first having completed an apprenticeship.<sup>3</sup> Hence there is a form of social contract in place in which both employers and individuals implicitly recognize the intrinsic and extrinsic merits of apprenticeships. In other words, there is broad acceptance that the system works. In countries such as the UK, where the work-based VET pathway is less well established than in, say, Germany, but where there is commitment to increase the number of apprenticeship places, the emphasis is very much upon communicating the potential economic benefits to employers and young people to be derived from participating in this type of training. It is in this context that the study described below was undertaken.

### **Apprenticeship training in the UK**

An apprenticeship in the UK is comprised of a set of qualifications classified as a “framework.”<sup>4</sup> Typically, an apprentice will be working towards the completion of several qualifications or certificates to be achieved at different stages of the apprenticeship training program. Only through the successful

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<sup>2</sup> T. Hogarth et al., *Review of Employer Collective Measures: Empirical Review*, Evidence Report 7 (Wath-upon-Deane: UK Commission for Employment and Skills, 2009).

<sup>3</sup> B. Casey, “The Dual Apprenticeship System and the Recruitment and Retention of Young Persons in Germany,” *British Journal of Industrial Relations* 24 (1) (1986): 63–81; B. Casey, “Recent Developments in the German Apprenticeship System,” *British Journal of Industrial Relations* 29, no. 2 (1991): 205–222

<sup>4</sup> The following website describes the UK Apprenticeship system in greater detail: <http://www.apprenticeships.org.uk/>

completion of all the qualifications or certificates that comprise the framework will the apprentice be said to have completed the apprenticeship.

Apprenticeships are available at different levels:

- i. **Apprenticeship** (sometimes known as foundation apprenticeship), which leads to a qualification broadly equivalent to that which will be obtained at the end of the upper secondary cycle of education, or at Level 3 according to the 1997 International Standard Classification of Education (ISCED). It is classified by ISCED as being at Level 3C because it is not designed to lead to higher education—where progression takes place it will tend to be towards an advanced apprenticeship but often the foundation apprenticeship is the limit of the training provided by employers. Typically, a foundation apprenticeship will take around one year to 18 months to complete.
- ii. **Advanced apprenticeships** can take a further two to three years to complete at the end of the foundation apprenticeship, depending upon the industrial sector in which the framework is being delivered. Often school or college leavers starting an advanced apprenticeship will not have completed an apprenticeship beforehand but will be expected to reach that standard within a year or so of commencing their advanced apprenticeship. Based on ISCED, advanced apprenticeships would be classified at Level 3A or 3B since there is scope for advancement into tertiary/higher education.
- iii. **Higher apprenticeships are designed for** apprentices working towards a qualification equivalent to one that might be awarded in tertiary/higher education (Level 5 in ISCED).

Frameworks are designed by Sector Skills Councils that are licensed by government to work with employers to design, among other things, apprenticeships according to a set of overarching rules and standards. Currently there are around 190 frameworks covering the full range of industrial activity in the UK.

The principal interest of this paper is in apprenticeships and advanced apprenticeships. Over recent years there has been concerted action led by government to increase the number of Apprenticeship places especially during the current period of weak labour demand in recognition of the fact that skill shortages can inhibit growth as the economic recovery gathers pace.<sup>5</sup>

Table 1 shows the recent increase in apprenticeship starts, and Figure 1 shows the broad areas of activity in which apprenticeship starts are concentrated.

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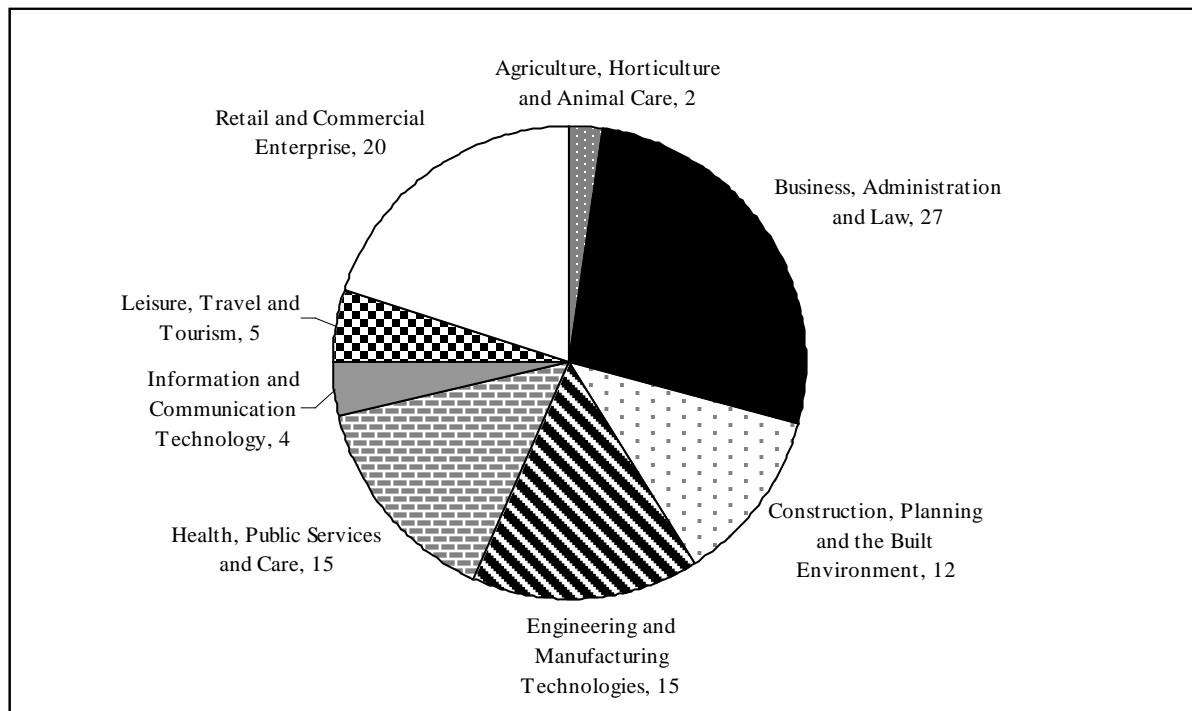
<sup>5</sup> N. Blake, J. Dods and S. Griffiths, *Employers skill survey: existing survey evidence and its use in the analysis of skill deficiencies* (Nottingham: Department for Education and Employment, 2000).

Table 1: Apprenticeship Program Starts by Level and Age in England (2003–2004 to 2008–2009)

Level	Age	2003–2004	2004–2005	2005–2006	2006–2007	2007–2008	2008–2009	% per apprentice 2003–2004 to 2008–2009
Apprenticeship (level 2)	Under 16	600	800	500	500	500	300	
	16–18	82,400	86,900	76,600	80,300	81,500	73,800	
	19–24	53,600	47,400	45,600	46,500	55,200	52,600	
	25+	-	100	100	100	14,600	31,700	
	<b>Total</b>	<b>136,600</b>	<b>135,100</b>	<b>122,800</b>	<b>127,400</b>	<b>151,800</b>	<b>158,500</b>	<b>3.0</b>
Advanced apprenticeship (level 3)	Under 16	100	200	-	-	-	-	
	16–18	25,200	25,700	22,400	24,800	25,500	25,100	
	19–24	31,700	27,600	29,500	32,100	34,900	32,100	
	25+	-	400	200	100	12,600	24,200	
	<b>Total</b>	<b>57,000</b>	<b>53,900</b>	<b>52,100</b>	<b>57,000</b>	<b>73,000</b>	<b>81,400</b>	<b>7.4</b>
All apprenticeships	Under 16	700	900	500	500	500	400	
	16–18	107,500	112,600	99,000	105,100	107,000	99,000	
	19–24	85,300	75,100	75,200	78,600	90,100	84,700	
	25+	-	400	300	300	27,200	55,900	
	<b>Total</b>	<b>193,600</b>	<b>189,000</b>	<b>175,000</b>	<b>184,400</b>	<b>224,800</b>	<b>239,900</b>	<b>4.4</b>

Source: Table 6.1 Data Service Statistical First Release December 2009  
[http://www.thedataservice.org.uk/statistics/sfrdec09/sfr\\_dec09\\_table6.htm](http://www.thedataservice.org.uk/statistics/sfrdec09/sfr_dec09_table6.htm); own calculations

Figure 1: Broad Area of Subject of Apprenticeship Starts in England (%)



Source: Data Service Statistical First Release December 2009 – data are for 2008–2009; own calculations

### Recent developments in the apprenticeship system

Apprenticeship training is open to people of all ages—as Table 1 indicates, there has been a substantial number of starts in the 25 years plus age group—but its roots as a government supported training program are in the youth training schemes that were in operation over the 1970s and 1980s. At that time, youth training schemes were regarded by some commentators as representing little more than an attempted quick fix to the problem of youth unemployment that offered little in the way of structured, substantive, externally accredited training.<sup>6</sup> This changed with the introduction of the Modern Apprenticeship program in the mid 1990s. With the introduction of modern apprenticeships in 1994, there was a systematic attempt to link work-

<sup>6</sup> A. Fuller and L. Unwin, “What Counts as Good Practice in Contemporary Apprenticeships? Evidence from Two Sectors in England,” *Education and Training* 49, no. 2 (2007).

based training, principally for young people, to rigorous, externally validated and certificated training. In summary, the Modern Apprenticeship program—now simply referred to as apprenticeship—sought to apply the high quality training that had traditionally been carried out in industries such as engineering and construction to those with no such tradition.

The initial evidence suggested that the modern apprenticeship program had been well received across a number of industrial sectors including those traditionally associated with this form of training and those where it marked a new development. For example, a study conducted just after the program was launched indicated that it had contributed to an increase in the volume of training undertaken by employers.<sup>7</sup> Whether it had sufficiently increased the amount of training undertaken by employers, or satisfactorily established itself as a preferred training route for employers is a moot point. It is notable that over the 1990s and early 2000s a number of inquiries were launched that drew attention to the need to reform, modify, and adapt apprenticeships in a number of ways, including those of the Modern Apprenticeship Advisory Committee,<sup>8</sup> the Modern Apprenticeship Task Force,<sup>9</sup> the LSC / DfES Review,<sup>10</sup> the House of Lord's Select Committee on Economic Affairs,<sup>11</sup> and the Apprenticeships, Skills, Children and Learning Act 2009.<sup>12</sup> The explicit aim of these inquiries was, by and large, to raise levels of participation in

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<sup>7</sup> C. Hasluck et al., *Modern Apprenticeships: A survey of employers*, (1997) DfEE Research Report, RS53 (London: Stationery Office, 2007).

<sup>8</sup> DfES, *Modern Apprenticeships: The Way to Work*, (Nottingham: Department for Education and Skills, 2001).

<sup>9</sup> Apprenticeship Task Force, *Apprenticeship Task Force Final Report: The Business Case for Apprenticeships*, (London: Apprenticeship Task Force, 2005).

<sup>10</sup> LSC/DfES, *End to End Review of the Delivery of Modern Apprenticeships*, (Coventry: LSC, National Office, 2005).

<sup>11</sup> House of Lords, *Apprenticeship: a key route to skills: Volume I - Report*, (London: House of Lords Select Committee on Economic Affairs, 2007).

<sup>12</sup> [http://www.opsi.gov.uk/acts/acts2009/ukpga\\_20090022\\_en\\_1](http://www.opsi.gov.uk/acts/acts2009/ukpga_20090022_en_1)

apprenticeship through the creation of a training program that provided a high quality alternative to the academic training route. At a strategic level, policy makers in the UK have tackled raising participation levels in two main ways:

- i. Make the VET system as a whole more demand-side oriented, whereby employers have a great input into the design, content, and structure of accredited vocational programs such as apprenticeship through Sector Skills Councils. In this system, the State provides the framework that ensures quality standards. The emphasis on the VET system being a demand-led one stems in large part from the *Leitch Review of Skills in 2006* and the subsequent reorganization of the VET system this gave rise to.
- ii. Signal to employers and individuals the economic benefits of undertaking apprenticeship training. For instance, a number of studies over the 2000s identified the economic gains to be obtained from acquiring additional qualifications and certificates of various kinds, including apprenticeship.<sup>13</sup>

While a large volume of evidence has been obtained on the returns to individuals from obtaining additional qualifications, there is much less evidence on the economic returns to the employer who invests in training. This in large part stems from the methodological difficulties of estimating the benefits to the employer. There are, in practice, so many factors influencing organizational performance that isolating the impact of training, such as that associated with apprenticeship, proves to be exceedingly difficult.<sup>14</sup> From the

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<sup>13</sup> S. McIntosh, *A Cost-Benefit Analysis of Apprenticeships and Other Vocational Qualifications*, Department for Education and Skills Research Paper RR834, (Sheffield: 2007).

<sup>14</sup> T Hogarth et al., *Review of Employer Collective Measures: Empirical Review*, Evidence Report 7, (Wath-upon-Deerne: UK Commission for Employment and Skills, 2009).



employer's perspective, of course, this is precisely the type of information required to make a business case for investing in apprenticeship.

### **Studies by the Institute for Employment Research on net training costs to employers**

In 1996, the University of Warwick Institute for Employment Research (IER) began a series of studies that sought to identify the employer's net costs of providing apprenticeship training, principally to young people aged between 16 and 24. Based on detailed case studies of employers, the IER Net Cost of Training series of studies revealed that, in general, employers in industries such as engineering and construction expended considerable sums of money on training young people to the standard they required to meet their business needs.<sup>15</sup> Though apprenticeship training was considered expensive by employers, it was regarded by them as money well spent because it conferred upon the business a range of benefits, including:

- improved skill supply because apprenticeships allowed employers to secure a supply of the skills they required, especially where there were shortages of skills in the local labour market;

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<sup>15</sup> T. Hogarth et al., *The Net Costs of Training to Employers*, Department for Employment Research Series (Her Majesty's Stationery Office, 1996); T. Hogarth et al., *Employers' Net Costs of Training to NVQ Level 2*, DfEE Research Report RR 57 (London: Stationery Office, 1998); T. Hogarth and C. Hasluck, *Employers' Net Costs of Training Modern Apprentices* (Department for Education and Skills, 2003); C. Hasluck et al., *The Net Benefits to Employers of Training* (London: Apprenticeship Ambassadors Network, 2008).

- reduced recruitment costs because the costs of recruiting and retaining fully experienced workers from the external labour market tended to be greater than training apprentices;
- a better fit between the employee and employer because the employer's former apprentices are steeped in the company's values because of the way they were trained as apprentices;
- reduced labour turnover because former apprentices are more likely to stay with the company over the medium term;
- producing a cadre of skilled workers from which future managers and supervisors could be selected;
- bringing new ideas into organizations.

The initial Net Costs of Training studies were concerned primarily with estimating the cost to the employer of training apprentices to various levels. In 2007–2008, the Apprenticeship Ambassadors Network—a coalition of leading employers, training providers, and government—commissioned IER to update the estimates of the employer's cost of training with the proviso that consideration should be given to assessing the extent to which employers were able to obtain a financial gain from engaging in Apprenticeships.<sup>16</sup> As will be explained below, this was estimated by calculating the net present value of apprentices to the organization training them in the first five years after the apprenticeship was completed. As the evidence will reveal, most

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<sup>16</sup> This report can be accessed at [http://www.employersforapprentices.gov.uk/docs/research/Research\\_1\\_521.pdf](http://www.employersforapprentices.gov.uk/docs/research/Research_1_521.pdf).

employers were able to recoup their investment in apprentices over a relatively short space of time.

It must be emphasized that the Net Costs of Training studies are based on a limited number of employer case studies—eight in each industrial sector—and consequently should be regarded as an indicative assessment rather than a definitive one of the employer's costs of apprenticeship training. But given the relatively limited evidence available on the costs and benefits associated with apprenticeship training from the employer's perspective, the case studies provide valuable insights.

### **The employer cost of apprenticeship training**

The evidence presented below—obtained from eight detailed case studies in each industrial sector—is based on an assessment of the costs borne by employers providing apprenticeship training in selected but distinct industrial sectors:

- i. engineering and construction, where there is a tradition of apprenticeship training; and
- ii. business administration and retailing where the introduction of apprenticeships is a relatively recent phenomenon.

The study upon which this paper is based included several other sectors but for purposes of exposition, the sectors above have been selected because they provide a useful contrast between (a) traditional / non-traditional and (b) production / service sectors. Some sectors are generally concerned with training towards the completion of an advanced apprenticeship, which apprentices will typically take around three to four years to complete from their

initial entry into the apprenticeship. Apprenticeships at Level 2—referred to as a foundation apprenticeship—tend to take around one to one and a half years to complete and are equivalent to a standard commensurate with qualifications obtained at the end of compulsory, lower secondary education.<sup>17</sup>

In order to estimate the costs of apprenticeship training, an accounting framework was constructed and the data were obtained from employers to estimate the costs. The accounting framework is presented in Table 2, and the overall cost/benefit to the employer is provided in Table 3. It should be noted that the cost to the employer is dependent upon completion rates. Completion rates in some industries can be relatively low and there has been concerted action by the relevant training authorities in the UK to improve completion rates. In 2007–2008, the overall apprenticeship completion rate was 64 percent in England, but the rate tended to be much higher in the employer case studies comprising this study. The cost/benefit calculations using data from the employer case studies are based on the cost of successful completion—so if three apprentices need to be hired in order for two to complete, the cost is based on the employer needing to train three people.

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<sup>17</sup> For a description of ISCED, see [http://www.unesco.org/education/information/nfsunesco/doc/isced\\_1997.htm](http://www.unesco.org/education/information/nfsunesco/doc/isced_1997.htm).

**Table 2: Accounting Framework of the Costs and Benefits of Training  
(per apprentice)**

	Year 1	Year 2	Year 3	Year 4	Total
<b>Basic information</b>					
Total number of apprentices					
Apprentice's salary <sup>1</sup> (£ per apprentice)					
Apprentice's productivity (% of skilled worker tasks the apprentice can undertake)					
Supervision (per apprentice) (% of training manager's time)					
Supervision (per apprentice) (% of line manager's time)					
Supervision (per apprentice) (% of supervisor's time)					
Training manager's salary (£ per apprentice)					
Line manager's salary (£ per apprentice)					
Supervisor's Salary (£ per apprentice)					
<b>Total training costs per apprentice (£)</b>					
Costs of recruiting the apprentice					
Course fees					
Supervision <sup>1</sup> (Total cost of training manager, line manager, and supervisor time spent supervising)					
Trainee salaries					
Employer payroll taxes					
Administrative costs					
Total cost per apprentice					
<b>Total training benefits per apprentice (£)</b>					
Value of apprentice's output <sup>2</sup>					
Income associated with apprentice					
Total benefit <i>per</i> Apprentice					
<b>Cost-benefit per Apprentice<sup>3</sup></b>					

1 Proportion of time multiplied by salaries.

2 Percentage of tasks of the fully trained worker undertaken by the apprentice multiplied by salary of full experienced worker, adjusted for time in the workplace.

3 Sum of costs minus sum of benefits.

**Table 3: Net Cost of Training in Selected Sectors (£)**

Sector	Level	Year of training				Total
		Year 1	Year 2	Year 3	Year4	
<b>Total costs</b>						
Engineering	Advanced	12,493	15,554	16,359	18,016	<b>67,044</b>
Construction	Advanced	14,858	16,701	21,161		<b>52,720</b>
Retail	Foundation	10,751				<b>10,751</b>
Business Administration	Foundation	14,842				<b>14,842</b>
	Advanced <sup>1</sup>					<b>40,404</b>
<b>Total Benefits</b>						
Engineering	Advanced	1,859	8,452	10,930	16,187	<b>37,429</b>
Construction	Advanced	3,518	10,301	16,859		<b>30,678</b>
Retail	Foundation	8,446				<b>8,446</b>
Business Administration	Foundation	13,959				<b>13,959</b>
	Advanced <sup>1</sup>					<b>36,506</b>
<b>Cost-benefit</b>						
Engineering	Advanced	10,633	8,566	7,034	2,529	<b>28,762</b>
Construction	Advanced	11,340	6,401	4,302		<b>22,043</b>
Retail	Foundation	2,305				<b>2,305</b>
Business Administration	Foundation	1,191				<b>1,191</b>
	Advanced <sup>1</sup>					<b>3,898</b>

**Note (1):** Durations of training in Business Administration varied between case studies—the figures represent an average assuming an average of three years to complete an advanced apprenticeship. Estimates are based on the cost of a person successfully completing his or her apprenticeship and thereby take into account dropouts from training.

It is apparent immediately from the information provided in Table 3 that there are substantial variations in training costs between industrial sectors, even where training is leading to the same level of qualification. There is also evidence of intra-industry variation but this is not so substantial. The evidence

indicates that in a flexible labour market, where individuals can move relatively easily between employers, there is a need for employers to constrain the costs of training in order that they can safeguard their investment. This is particularly so in sectors such as retailing where there are relatively high levels of labour turnover. A similar phenomenon has been identified in Switzerland, which also has a relatively flexible labour market and generally records lower employer costs compared to similar levels of training in the less flexible German labour market.<sup>18</sup> While the cost data provide information about the extent to which employers invest in training, it does not give an indication of the extent to which employers recoup that investment even if employers, in general, had a belief that their expenditure on apprenticeship training was, in their opinion, money well spent.

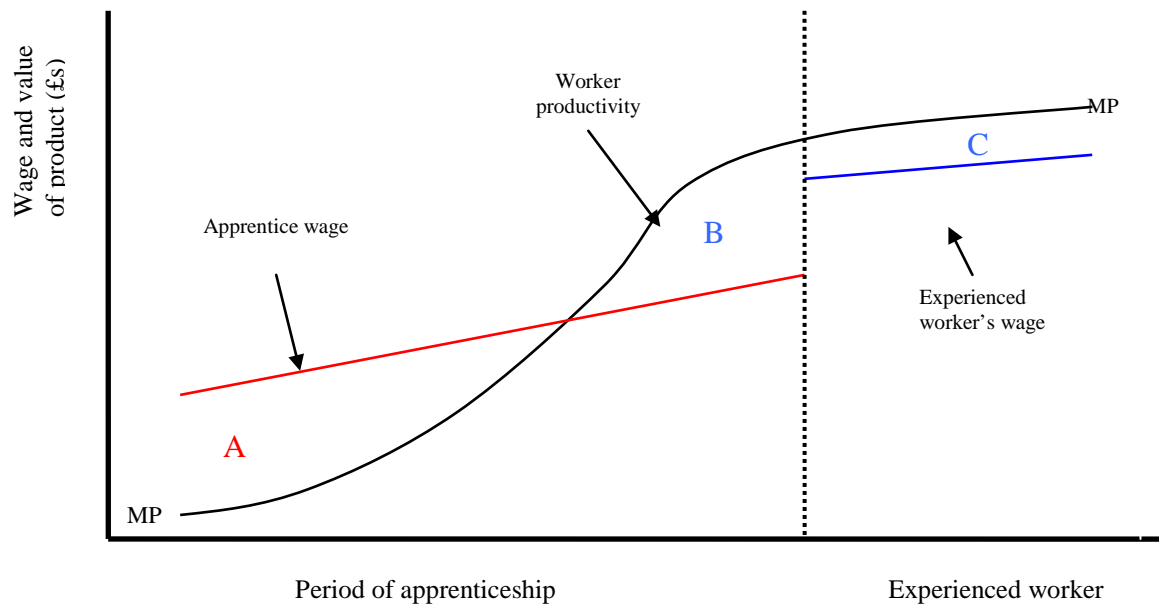
### **Estimating the economic benefit to the employer**

It has long been recognized that training by employers is a form of investment in “human capital.” As with all investments, the decision whether or not to engage with apprenticeships will reflect the employer’s perceptions of the costs of training and the longer-term benefits that will accrue to their business. The situation facing employers can be represented in a stylized manner by Figure 2.

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<sup>18</sup> J. Mohrenweiser and T. Zwick, “Why do firms train apprentices? The net cost puzzle reconsidered,” *ZEW Diskussionspapiere der DFG-Forschergruppe*, no. 3468269275 (2008).

Figure 2: A Stylized Model of Apprenticeship Training



In competitive labour markets, under specific conditions, employers will tend to pay workers the value of their marginal product. Training breaks that equality. A wage higher than marginal product may be paid during a period of training in the expectation that the cost of doing so will be recouped later by paying fully trained employees somewhat less than the value of their marginal product. In Figure 2 the (marginal) productivity of a recruit to an apprenticeship is represented by the curve MP-MP. This is likely to be low at the outset but increase as the apprentice acquires competence and towards the end of the apprenticeship is likely to be close to that of an experienced worker who is fully competent. Over much of the apprenticeship period the apprentice wage exceeds the apprentice product (especially where training is full-time and off the job). The level of apprentice wage is likely to reflect the employment alternatives open to young people (such as unskilled work) as well as institutional factors such as the National Minimum Wage and the



benefit regime. Once the apprenticeship is completed, the apprentice will commence work as a fully experienced worker at a higher wage. The experienced worker's wage will reflect his or her marginal product but be set by the employer at a level that leaves a sufficient difference (or markup) to provide the employer with a return on the cost of training the apprentice in the first place.

The approach taken to estimate the net benefit to the employer amounts to estimating the net costs during the apprenticeship period (Areas A and B in Figure 2 together with the cost of supervision and direct training costs such as course fees). The potential returns to employers following the completion of the apprenticeship amount to Area C in Figure 2 (the return to investment in apprenticeships).

The impact of apprenticeship training on an organization's productivity or profitability is exceedingly difficult to estimate, so an alternative approach was adopted based on estimating the time taken for employers to recoup their investment in apprenticeships once the training had been completed. To estimate the payback period a two-stage method was employed:

- i. The future value derived from training an apprentice was calculated by summing the future benefits accruing to the business from employing a fully skilled worker (an ex-apprentice). Since the benefits (S) occur in the future, they must be discounted by some discount rate ( $r$ ) to a present value (PV). For the purpose of this exercise, a 6 per cent discount rate has been used since this is roughly equal to the interest rate (a market rate that reflects both time preference and expectations of inflation) at the time the study was undertaken.

- ii. The costs of training apprentices was deducted from that PV to estimate the net present value (NPV).

The calculation can be expressed as follows:

$$\text{NPV of Apprenticeship} = \left[ \sum_{t=1}^{t=n} \frac{S_n}{(1+r)^n} \right] - \left[ \sum_{t=1}^{t=m} \frac{C_t}{(1+r)^m} \right]$$

where  $S_n$  is the value of the Apprentice at time 1, 2, 3, .....n, n is the number of time periods over which benefits from employing an ex-apprentice accrue, m is the number of time periods required to train an apprentice, r is the discount rate, and  $C_t$  is the cost of the apprenticeship.

This is a fairly common investment appraisal technique that is—as the discussion below demonstrates—dependent upon assumptions made about (a) the extent to which the employer is able to appropriate the gains resulting from the improved productivity apprenticeship training brings about; and (b) the size of productivity gain resulting from apprenticeship training.

Economic theory suggests that employers will recoup their investment in training by paying a wage to experienced workers that is less than their marginal productivity. It is difficult to know the size of that margin. An arbitrary assumption could be made about the size of the margin but, fortuitously, there is evidence that suggests that employers who provide training will raise the wage of fully trained workers by around half of the increase in productivity brought about by training (Dearden, Reed and Van Reenen 2000, 2005). In other words, the value of the productivity gain from training is shared more or less equally between the trained worker and the employer. It is this difference

that enables employers to bear the cost of training and yields a return on their investment.

The next step is to gauge the size of the productivity gain resulting from the apprenticeship training delivered by the employer. In the case study businesses, establishing the scale of the productivity gain from training is complicated by the absence of direct evidence of the wage and productivity of unskilled employees. Only data on apprentices is known and the business might pay apprentices more than the unskilled wage. In fact, in the case studies there is a notable similarity between apprentice wages as a proportion of the experienced worker wage and the reported productivity difference between the two. This could be seen as suggesting that apprentices were being paid something approximating the wage and productivity of an unskilled worker.

On the basis of the evidence from the case studies and the proposition that employer and skilled worker share equally the benefit of training, it is possible to suggest the likely scale of the employer share of the productivity gain from training apprentices. The value of the additional productivity derived from training an apprentice must be roughly equal to twice the difference between the wage of the apprentice and the experienced worker. This extra value is then split equally between the skilled worker and the employer. This means that the business benefit from their investment is the same as that accruing to the fully trained worker, that is, the difference between the skilled worker's wage and the apprentice wage (which proxies the unskilled wage). This benefit will accrue over each future time period so long as the fully trained worker remains with the employer.

Table 4 suggests the likely scale of the business benefit from training expressed as a markup over the trained workers wage in each of the sectors covered by the case studies. As might be expected, in engineering the markup (of around 50 percent) was substantial and reflected the length (three to four years) and intensity of apprenticeship training in the sector, which leads to substantial increases in productivity after training. By contrast, the productivity “gap” between the apprentice and the skilled worker was much less in retailing and business administration where training was often of shorter duration leading to smaller productivity gains.

Table 4: The Value of the Employer’s Share of the Productivity Gain from Apprenticeship Training as a Percentage of the Experienced Worker’s Wage

Sector	Percentage of experienced worker wage
Engineering	50
Retailing	11
Business Administration	22
Construction	50

Source: IER/AAN Net Benefits of Training Study 2008

Based on the method described above, Figures 3 to 6 present estimates of the investment payback periods for a range of sectors. The results are dependent, like all investment appraisal techniques, upon the assumptions made about discount rates, the productivity gain resulting from training an apprentice, and the extent to which that productivity gain is appropriated by the individual (in higher wages) or the employer. The paper has tried to be explicit about the assumptions made and the techniques used so that

alternative assumptions can be made and alternative estimates derived.

Overall, the data in Figures 3 to 6 indicate that the net costs of an employer's investment in apprenticeships, in all the sectors examined, is likely to be returned after a relatively short period of time. In retailing, the employer's investment in apprenticeship training (the net cost) was likely to be paid back sometime between the first and second year of post-apprenticeship employment. This short payback period reflected the low net investment cost and the relatively high productivity of the apprentice while training relative to the fully experienced worker (i.e. even as trainees they were able to carry out a high percentage of the tasks undertaken by fully experienced workers).

Apprenticeships in business administration also had a relatively short payback period of less than two years. Despite the high net cost of apprenticeships in engineering and construction, the high value of added productivity once apprentices were fully trained meant that the investment was recouped in less than two years in the case of construction apprenticeships, and somewhere between two and three years in the case of engineering.

Figure 3: Estimated Payback in Engineering (£)

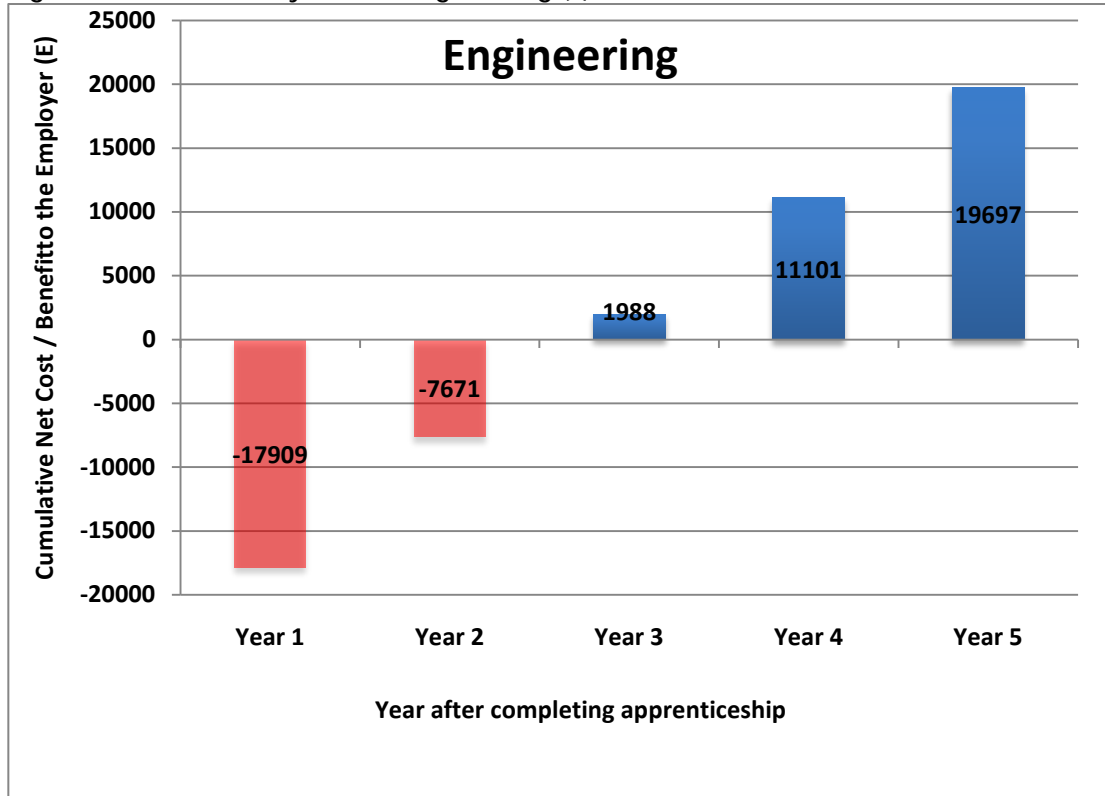


Figure 4: Estimated Payback in Construction (£)

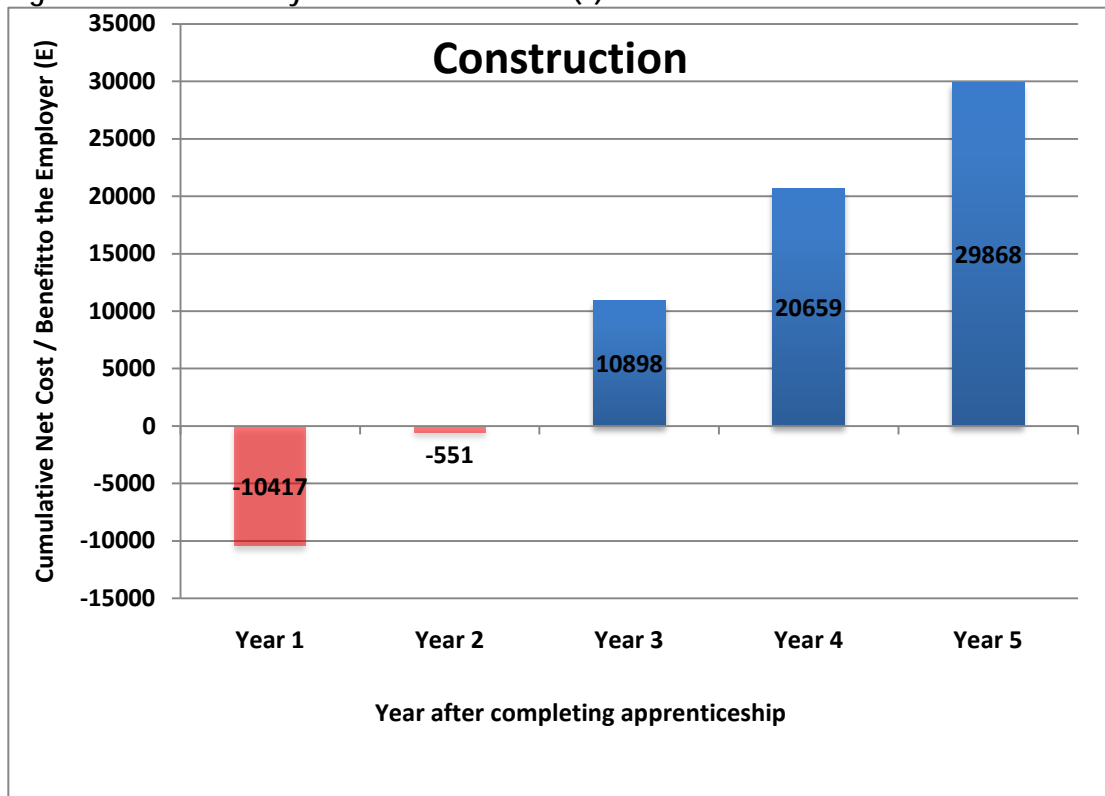


Figure 5: Estimated Payback in retailing (£)

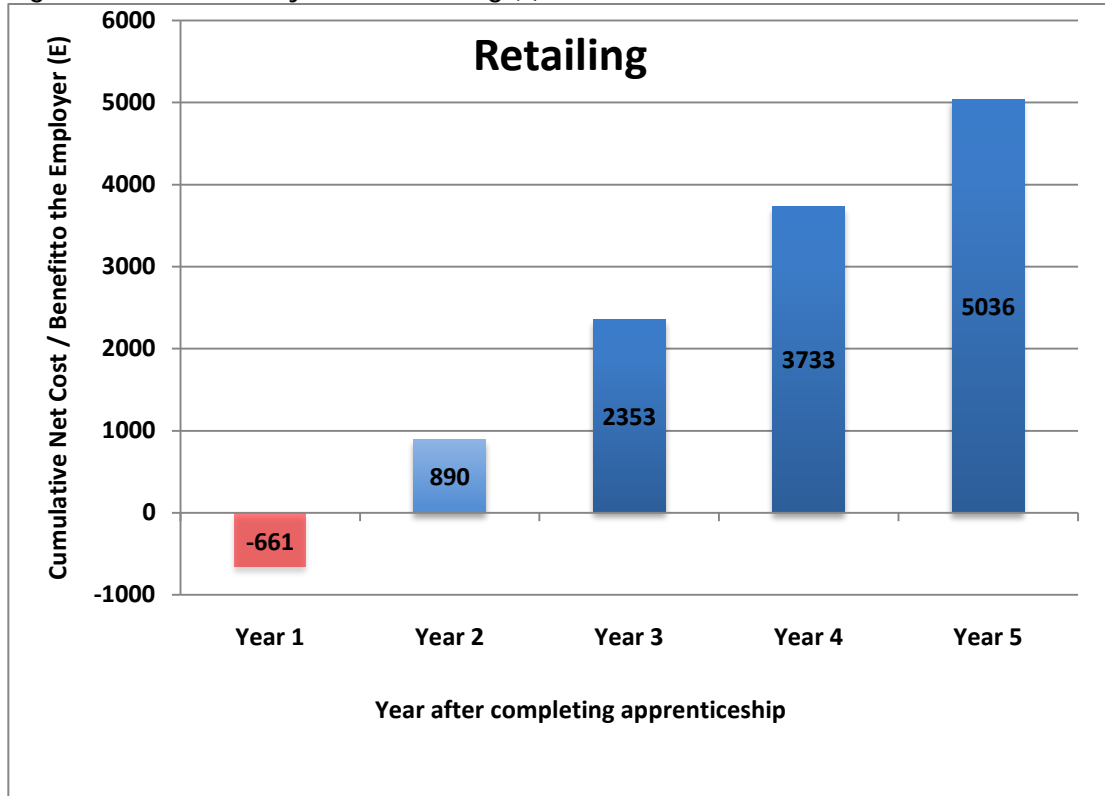
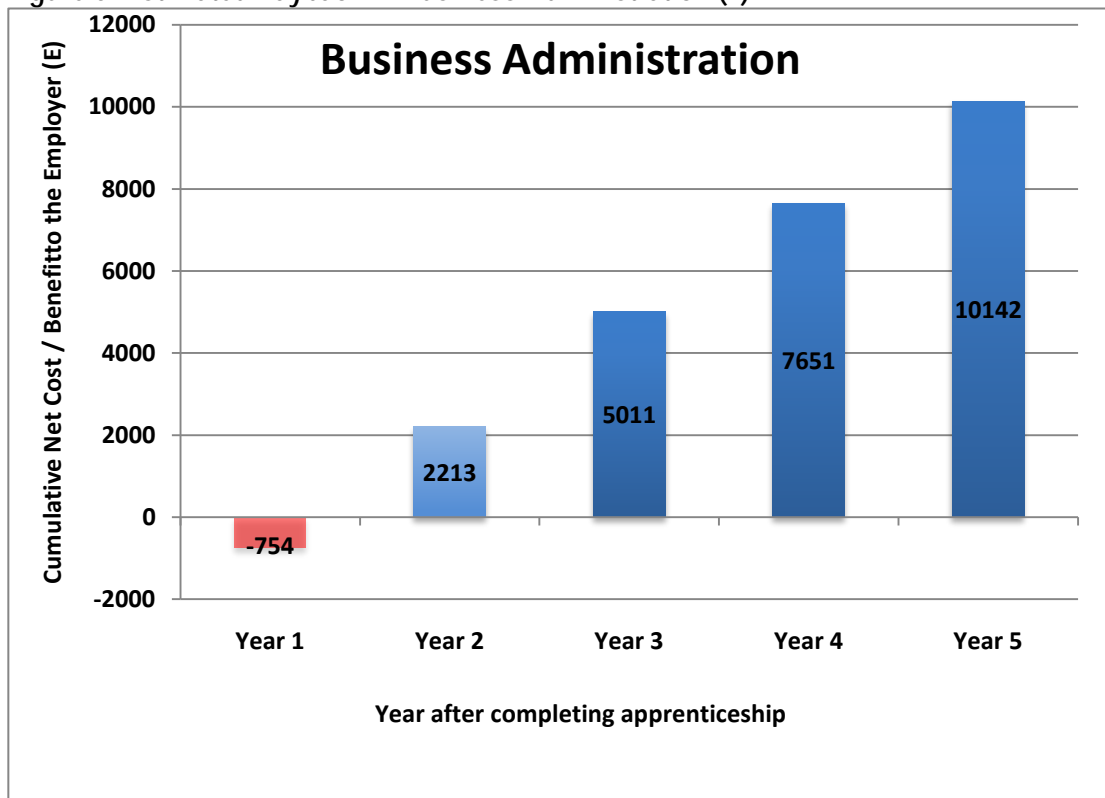


Figure 6: Estimated Payback in Business Administration (£)



## **Capturing the benefits of apprenticeship training**

Whether or not these returns are obtained is obviously dependent upon the extent to which Apprentices stay with the employer who trained them once their training is complete. It is important to note that labour turnover and dropout was not reported to any significant degree by case study respondents, even in those sectors that are reputed to suffer from high labour turnover. This does not mean that dropout (and the associated cost to employers) was not important, but it may mean that the case study sample was biased towards employers who offered “good apprenticeships” and retained their apprentices.

Benefits to employer-provided training result when employers regard apprenticeship and apprentices as important investments in the future of their organization. The paybacks reported here do not come about simply as a consequence of taking on apprentices. It was apparent that in many of the case studies, employers expended considerable resources on the selection process to ensure that apprentices were well suited to the demands of the training that was on offer. This would sometimes include meeting with the parents where the apprentice was at the relatively young end of the age scale to inform the parents/guardians of the support they might be required to provide to ensure that the apprentice completed his or her training. Similarly, employers had a range of pastoral and academic support systems in place to ensure that apprentices were able to meet the training standards required and were not distracted by life outside of the workplace. And finally, employers had in place career structures so that upon completion of the apprenticeship, apprentices could clearly see the various career pathways open to them within



the firm such that they might be persuaded of the benefits of remaining with their current employer over the medium to long term.

## **Conclusion**

Overall, the evidence suggests that employers in general are able to recoup the costs of their investment in apprenticeship over a relatively short period of time, so long as they are able to retain the services of the apprentices they have trained. The case study evidence indicated that those employers with relatively high completion and retention rates had in place a variety of human resource policies that, for instance, provided apprentices with opportunities for career progression once they had completed their apprenticeship. In sectors such as Engineering and Construction employers reported that they were, in general, able to retain the services of the apprentices with many going on to fill supervisory and management positions within the organization. In contrast, sectors such as retailing reported that labour turnover rates were relatively high and were, accordingly, less confident that they would be able to retain the services of their apprentices. It is notable that in this sector the costs of training were recouped relatively quickly.

It should also be noted that the estimates of the payback period are dependent upon the assumptions made about the productivity gains from apprenticeship training and the discount rate used to estimate the NPV of the apprentice to the organization. Nevertheless, the research provides a means by which the payback period can be estimated. This can be a valuable tool in those situations where employers require a business case to be made before investing in training. It also needs to be borne in mind that the estimates are based on a relatively small number of observations and, accordingly, the

estimates of the payback period should be treated as indicative rather than definitive. Even so, the evidence suggests that where employers carefully husband their investment in apprentices, they can recoup their costs over a relatively short space of time.

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