

# **Job Related Training – Costs, Benefits and Discrimination**

## **ECO-3A15 Labour Economics**

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### **1. INTRODUCTION**

The purpose of this study is to understand the costs to firms of training schemes, and possibilities of discrimination when deciding who is offered training. In the first part of this study, I look at the importance of training, and study the costs and benefits associated with it. Particular attention is paid to the equilibrium where the costs of offering training equal the gains. An important paper by Becker (1962) has stimulated my research upon this topic, and I later build upon one of his models to calculate the conditions of the aforementioned equilibrium. The later part of my study investigates the possibilities of discrimination, and the strategies that can be implemented to prevent it.

The completion of some level of schooling is merely the beginning of the training process for an individual. Upon leaving the education system, workers enhance their human capital stock through job related training. This can be through official training programmes, or more casual forms such as shadowing another employee or on-the-job training (OJT). Training can be very costly, with costs including training resources, instructors, and lost output. Therefore employers may be selective as to who receives training. When it is considered that at least half of our human capital is acquired on the job (formal and informal), it is imperative that discrimination is not involved in the decision making process. This is important due to the recognised positive correlation between human capital and wages.

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Training is incredibly important for firms, and is vital to ensure that employees are on top of their economic, technological and social environment. Training is necessary to increase the productivity of workers, and can lead to greater efficiency for firms. It has been proven that there is a positive link between training and labour productivity (Bartel 1991). Bartel showed that businesses operating below their expected labour productivity levels were able to bring themselves up to the productivity levels of comparable businesses within a few years of implementing new training programmes. For implementers that started at the same productivity level as competitors, some were able to realise gains that exceeded their competitors' gains. Training can also have an indirect effect on the whole workforce due to the 'spillover effect' (Dumas 2008). Knowledge from a trained employee can be transferred to other employees in the workforce.

Offering training to the workforce cannot only increase productivity to create a competitive advantage for a business, but it can also be used as a recruitment tool. Workers are aware of the benefits of receiving good training, and therefore use training prospects as a factor when deciding which jobs to apply for. A report by Ernst Young showed that in 2009, 41% of students finishing University view the level of training as the most important factor in prospective jobs.<sup>1</sup> The following quotation demonstrates this point: "McDonald's has been deluged with job applications in recent months, receiving up to 1,500 CVs a day, including many from university graduates struggling to find work during the recession."<sup>2</sup> Firms are able to attract a superior workforce by investing in training programmes.

So why do workers value training prospects so highly? Training is especially important for younger workers who have a lower level of human capital. Workers are often willing to accept a lower wage in exchange for training when younger, since they will reap the benefits of higher wages later on in life (Becker 1962). Training can provide them with new or improved skills, which equates to a higher level of human capital. This allows trained individuals to apply for more demanding roles that warrant higher wages.

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<sup>1</sup> Allport, R., *"Training and development 'more important than employee benefits' for graduates"* You at Work, Date accessed: 09/01/12, <http://blog.youatwork.com/2011/12/29/training-and-development-more-important-than-employee-benefits-for-graduates/>

<sup>2</sup> Moore, M., Telegraph, <http://www.telegraph.co.uk/education/universityeducation/5306317/McDonalds-plans-to-offer-McPhDs-to-boost-staff-training.html>

## 1. ECONOMETRIC ANALYSIS

Using data from the Labour Force Survey (LFS), I study the effect that job related training has on pay in the short term. In my analysis I have controlled for other determinants of pay, which include Gender, Age, and Industry. The main variable of interest is (*ed13wk*). The definition of this variable is: “Job related training or education in the last 3 months (in work)”. The dependent variable (*grsswk*) measures the “Gross weekly pay in main job (£)” of an individual. When controlling for age I included the variable (*age2*), which is the quadratic of age, necessary to capture the concave relationship between age and pay. I also created some dummy variables to control for type of role using Standard Occupational Codes 2010 (SOC2010). The base group in this case is “Elementary Occupations”, which includes occupations that consist of simple, routine tasks that usually required some form of physical effort e.g. cleaner.

TABLE I: REGRESSION RESULTS FOR GROSS WEEKLY PAY (£)

	Gross Weekly Pay (£)	t
<b>(Constant)</b>	-496.424*** (35.428)	-14.012
<b>Job related training in the last 3 months (in work)</b>	18.760** (7.804)	2.404
<b>Age</b>	30.774*** (1.716)	17.931
<b>Age Squared</b>	-.343*** (.020)	-17.112
<b>Gender</b>	195.581***	25.434

	(7.690)	
<b>Completed a Degree</b>	124.506***	8.292
	(15.015)	
<b>Managers, Directors and Senior Officials</b>	502.891***	31.712
	(15.858)	
<b>Professional Occupations</b>	383.016***	28.594
	(13.395)	
<b>Associate Professional and Technical Occupations</b>	305.163***	21.447
	(14.479)	
<b>Administrative and Secretarial Occupations</b>	142.954***	9.873
	(14.479)	
<b>Skilled Trades Occupations</b>	119.208***	7.209
	(16.536)	
<b>Caring, Leisure and Other Service Occupations</b>	70.660***	4.509
	(15.672)	
<b>Sales and Customer Service Occupations</b>	63.234***	4.004
	(15.792)	
<b>Process, Plant and Machine Operatives</b>	68.305***	3.819
	(17.885)	

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Notes: Standard errors are in parentheses. Stars denote the significance level of coefficients: \*\*\* 1 percent, \*\* 5 percent, \* 10 percent. Full regression results are available in the appendix.

The results in Table I indicated a positive relationship between Job Related Training and Wages. The Training coefficient estimates that an individual that has received training within the last 3 months will earn on average £18.76 more per week than an individual that hadn't received training in that time frame (assuming ceteris paribus). This is significant at the 5% level. It must be noted that this regression captures only the short-term effect of receiving training. There are likely to be long-term increases in pay after training is received; unfortunately the LFS does not capture the necessary data for this analysis. The  $R^2$  value is equal to 0.282. This suggests that 28.2% of the variations in Gross Weekly Pay are explained by the variables in my model. This is a relatively low  $R^2$  value, suggesting that other important determinants of pay have been omitted. Ethnicity was originally present in the regression, however I omitted it from the model due to its lack of significance in this dataset. The huge number of missing entries into the ethnicity variable may explain this.

TABLE II

## DESCRIPTIVE STATISTICS FOR GROSS WEEKLY PAY (£)

	<b>N</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Mean</b>	<b>Std. Deviation</b>
<b>Gross Weekly Pay (£)</b>	11122	3	23076	455.22	425.535

Table II displays some descriptive statistics for Gross Weekly Pay. Using the mean value, we can evaluate that job related training within the past 3 months increases average pay by approximately 4.12%. Capturing just the short-term effects demonstrates the significance of job related training on pay, and therefore the importance that workers are not discriminated against when training is offered.

## 3. TYPES OF TRAINING AND WHO PAYS

Training can be broadly categorised under two headings, general and specific (Becker 1962). General training once acquired will enhance productivity equally in any firm that the employee works in. It is training of general skills such as typing, computer literacy, and presentation skills. These types of skills are found frequently in the labour market. Specific training is only beneficial whilst the employee

remains within the organisation where the training occurred. This is because skills learnt are specific to the business. Examples include: training to use a bespoke piece of software, or learning the authority structure of a particular organisation. After leaving the company, these skills become redundant to the employee. In reality, training is often a mixture of these two types, with some skills transferable within the same industry.

When observing who pays for training (employer or employee), there is often a distinction between these two types. After completing some form of general training, a worker's marginal productivity will have risen, not only in their current job, but also in any future job they were to take on. This means the worker's market wage will increase after a receiving general training. Therefore firms have little incentive to pay to train an employee if they are likely to move employers to gain a higher wage after the period of general training. So firms will only provide general training if they do not have to pay for it. This is proven mathematically.

Consider a competitive firm that is engaging with an employee for two periods. Training occurs on-the-job in the first period, and the employee receives no training in the second period but is more productive now in possession of new skills. In the first period the employee's marginal product is equal to  $MP_1$  and earns a wage equal to  $w_1$ . In the second period, the employee's marginal product is equal to  $MP_2$ , and is paid a wage of  $w_2$ . Values in period 2 are discounted at the rate  $r$ . The cost of training is equal to  $T$ . The following equation can be formed using the above values:

$$w_1 + T + \frac{w_2}{1+r} = MP_1 + \frac{MP_2}{1+r}$$

(1)

In period 2, competitor firms will be willing to pay a wage equal to the employee's marginal product in period 2. The marginal product in period 2 is equal wherever the worker is employed since all new skills learned are fully transferable; and equals  $MP_2$ :

$$w_2 = MP_2$$

(2)

Therefore equation (1) can be simplified to the following:

$$w_1 + T = MP_1$$

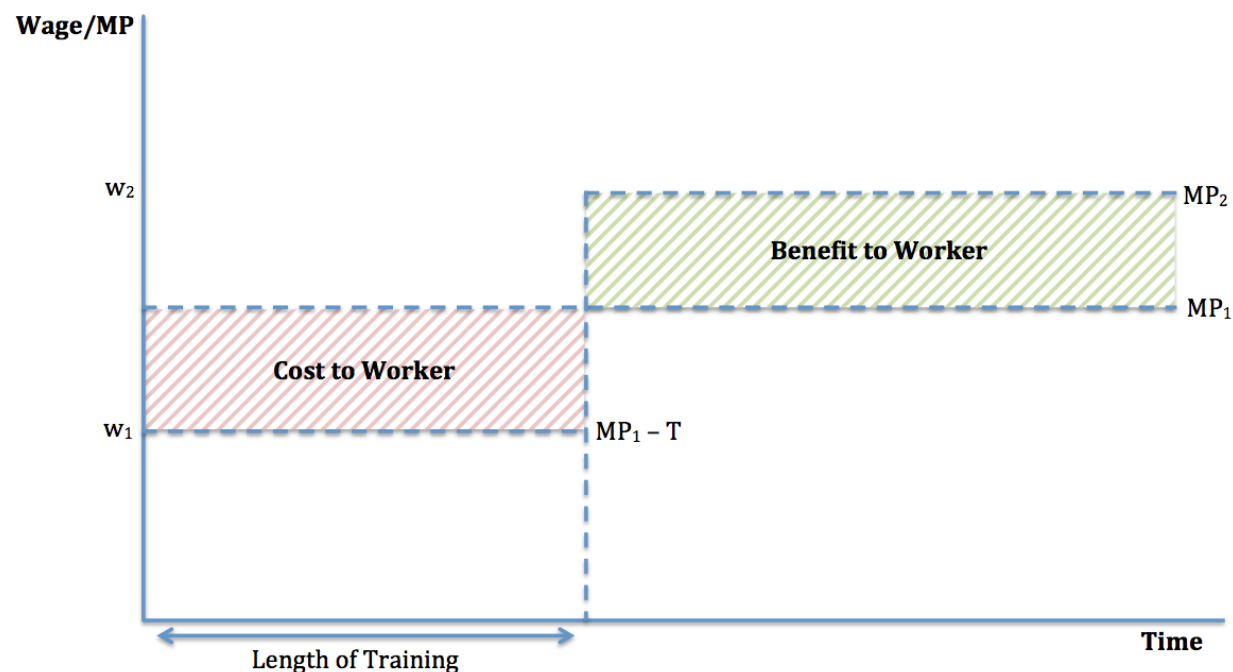
or

$$w_1 = MP_1 - T$$

(3)

This means that the employee's wage in the first period will be lower than their marginal product, since they are effectively paying for their own training. In a competitive environment, this is the only way in which employees could receive general training. The graph below demonstrates how employees incur a cost in the first period, and the reap benefits in the second period:

FIGURE 3.1: WORKS PAY FOR GENERAL TRAINING



Specific training however provides a different outcome. Once an employee leaves a firm, any specific training that they have acquired cannot be transferred to a new role. Therefore, referring back to the previous example, in period 2 if the employee were to leave the firm, their marginal productivity will be equal to what it was back in period 1. This means that market wage ( $w_m$ ) a competitor would offer the employee, after training, would be equal to  $MP_1$ .

$$w_m = MP_1$$

(4)

The firm can pay for the specific training in the first period, provide the employee with a wage equal to  $w_1$  for both periods, and then receive the gains in the second period since:

$$w_1 < MP_2$$

(5)



However, this assumes that the employee does not quit in period 2. If the employee were to quit, the firm will have lost the capital invested into training, and be unable to capitalise on the gains in period 2. If the firm has to pay for the training, they may be reluctant to train employees due to this risk.

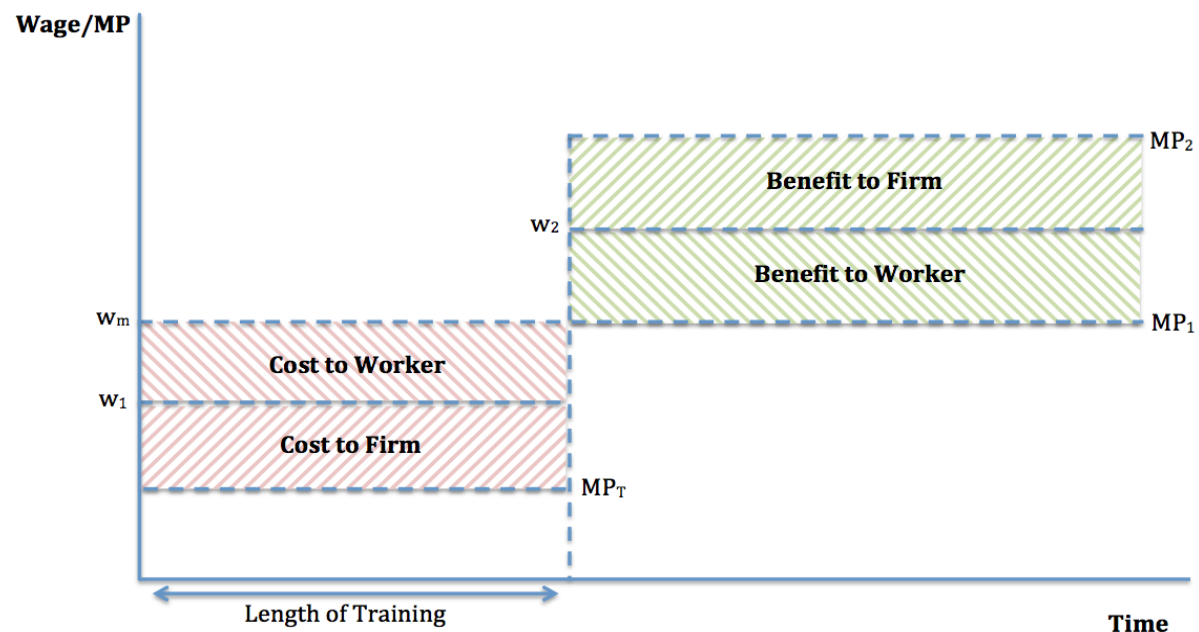
Another option is for the employee to pay for the training, and then achieve a higher wage in then second period once the training is complete. Although this is what often occurs for general training, it is less likely to happen for specific training. The employee accepts a low wage in the first period, but in the knowledge they will receive a higher wage in the next period. But with specific training being non-transferable, the employee would lose the higher wage if they were dismissed or moved firms. This time the employee may be reluctant to invest in training, at the risk of not recouping this investment if they were fired.

So far, neither the employer nor employee would invest in specific training due to the risks involved. This is detrimental for both parties since the firm makes no improvements to efficiency, and the employee does not increase their earnings. However it is possible to achieve a situation where training does occur. This is where the employer and employee each share some of the cost. If the wage in period 2 is set between the market wage and the employee's marginal product post training, both parties are more likely to invest in education. The employer has no incentive to fire the employee, since he/she is working for a wage lower than their marginal product. The employee has no incentive to quit since they can only achieve a lower wage elsewhere. The inequality below must be true for this to be possible:

$$w_m < w_2 < MP_2$$

(6)

FIGURE 3.2: FIRMS AND WORKERS SHARE THE COST OF SPECIFIC TRAINING



#### 4. EQUILIBRIUM MODEL

The above theories have been made prominent by Gary Becker (Becker 1962). Since this study is concerned with discrimination, I have built upon this model to make it more appropriate for my analysis. When a firm is considering whether or not to train an employee, they are concerned with the number of years the employee will stay in the firm after receiving the training. The longer the employee stays with the firm, the more time they have to recoup their investment. It is possible that firms may statistically discriminate against certain types of individuals if they believe some types are more likely to remain in the company for a shorter period of time. I go into depth about these different types of discrimination later on in this study. Groups I believe that particularly face discrimination are (young people, particularly young women, and the elderly). I have adapted the model to cater for any number of periods. In this model  $Y$  refers to the number of periods the worker stays at the firm for, and  $1 - \delta$  is the discount factor. The following inequality must be true for the training to go ahead:

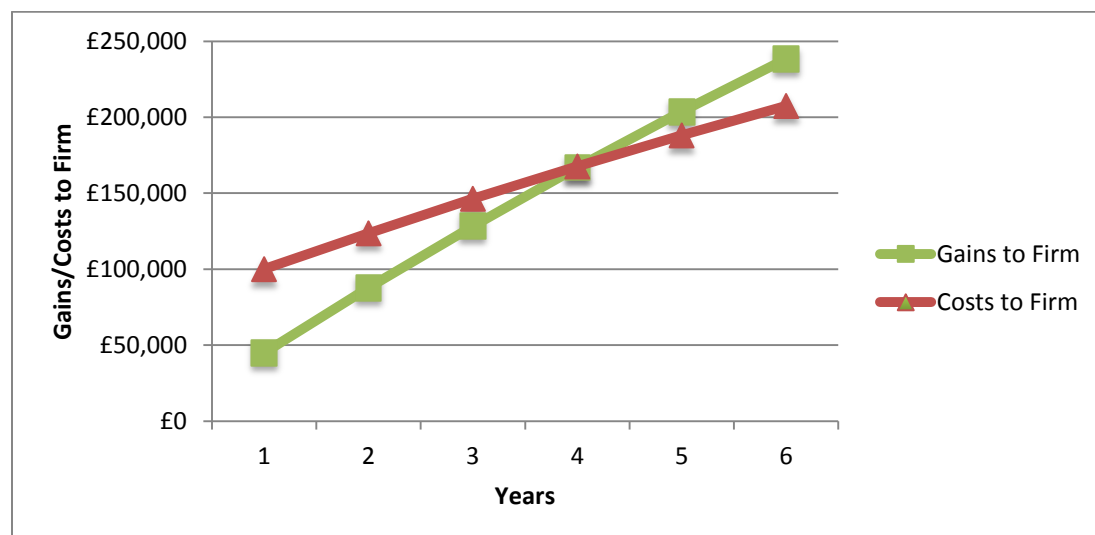
$$T + \frac{w(1 - \delta^Y)}{1 - \delta} < \frac{MP(1 - \delta^Y)}{1 - \delta}$$

(7)

The proof of this equation can be found in the appendix, along with screenshots of an excel program that I have devised to accompany my project. The program is a live version of equation (7), and enables employers to alter different variables to decided whether to go ahead with training. The program can also calculates the number of years the employee needs to stay with the firm, or the wage the firm needs to pay to break even. The live program is available upon request.

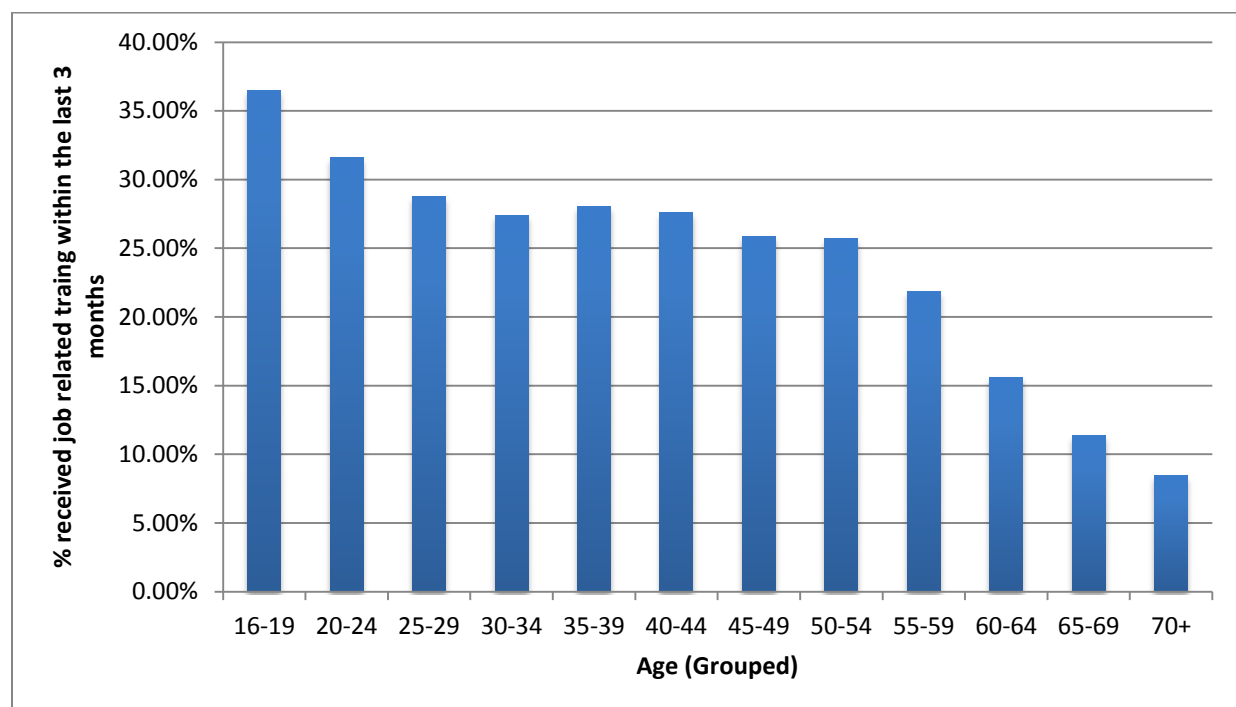
#### EXAMPLE I: THEORETICAL EXAMPLE OF ACCOUNTANCY GRADUATE SCHEME

The accountancy firm pays a graduate a salary of £25,000 whilst they are on the graduate programme. Training costs the firm £75,000, and is for the graduate's ACA qualification. Whilst the graduate is training, the firm is able to hire them out for a value equating to £45,000 per annum (Marginal Product). The discount factor is 5% per year. The formula tells us that the firm needs the employee to stay with the firm for 4.05 years in order to break even. So the firm could make the graduate scheme a 5-year contract. Also, if the graduate were to leave the firm after 3 years, the firm would need to charge the employee a fine of £17,950 in order to recoup costs. The firm would need to pay a salary of £14,943.03 if they wished to recoup their costs within 3 years.

FIGURE 4.1: GAINS AND COSTS OF TRAINING TO A FIRM OVER TIME

## 5. DISCRIMINATION

The descriptive statistics in the appendix show that there is a negative relationship between age and the likelihood of receiving job related training. This is also displayed in the graph below. Between the ages of 25 and 54, the percentage of workers that have received job related training with the last 3 months is between 25 and 30%. However, beyond the age of 55, the percentage of workers receiving training dramatically falls. There are a number of reasonable explanations for this.

**FIGURE 5.1: PERCENTAGE OF PEOPLE RECEIVING JOB RELATED TRAINING BY AGE GROUP**

Firstly, human capital increases with age meaning some workers may reach a point in their career where they have acquired all of the training they need to do their job. They may reach a stage at which they are content with their career, and do not wish to progress any further. Alternatively there may be no further progress possible if they are at the top of the hierarchy.

Secondly, it may be difficult to train the older generation inline with the rapid technological transformations that have been introduced into the workplace. Also, older workers may be fixed in their ways, with lifetime habits that are difficult to alter. “You can’t teach an old dog new tricks.” A study into the digital skills gap showed in 2004 there were significant differences in the performance of different

age groups in some digital literacy tasks. Young workers outperformed older workers by a fair margin. However by 2009 the skills gap had virtually closed, with the older workers making a marked improvement, whilst younger workers made only a marginal improvement (Eshet-Alkalai & Chajut 2010). This demonstrates that although younger workers may adapt to new technology quicker, older workers are capable of embracing changes also. Employers could take this into consideration, since older workers may require longer training periods.

Thirdly, employers may be conscious that an older worker is nearing retirement. With this in mind they may offer training to a younger worker over an older worker. Since the younger worker has a longer period until retirement, they offer a greater time span in which to recoup the initial investment in training. Providing an employer knows the employee's date of retirement, they could use equation (7) to calculate whether it is economically viable to train them. This could explain why older workers feel discriminated against, and do not receive as much training as the younger population. If employers statistically discriminate against older workers, making the assumption they will retire at a particular age; workers who wish to continue working past this age may not be able to receive training they require (even though it may be economically viable). This could limit the opportunities offered to older workers, which is especially concerning now that many people are forced to work past the retirement age due to depleted savings and small pensions.<sup>3</sup>

Age discrimination against older workers can have negative effects on productivity. Studies into the perceived impacts of age discrimination showed older workers that felt discriminated against would perform their basic job as required, but were less likely to be model employees (Snape & Redman 2003). Although feeling less loyalty towards their employer, they feel tethered to their employer due to their perceived disadvantages in the labour market. Some workers may escape discrimination completely by seeking early retirement. Both of these effects have a negative impact on the economy due to the reduction in productivity, and therefore discrimination against older workers should be avoided at all costs.

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<sup>3</sup> BBC News, *"Many Workers Cannot Afford to Retire, Actuaries Warn"*, Date accessed: 12/01/12, <http://www.bbc.co.uk/news/business-14370452>

Younger workers can also feel discriminated against in the labour market. Snape and Redman's research suggests that young people are the group that feel most disadvantaged by age discrimination, however they found that training was an area of lesser concern. Younger people mainly face discrimination during the job application process according to the research (Snape & Redman 2003). We used to live in a society where a job was for life, but in recent times it far more common that people switch jobs frequently. One website suggests young people should switch jobs every two years to build an adaptable skill set and make a more stable life.<sup>4</sup> With these attitudes, it would be understandable if firms wished to protect themselves from 'job hoppers'. It would be irrational to invest in an individual's training if they were likely to move careers 6 months down the line.

The descriptive statistics in the appendix suggests there isn't an issue of age discrimination for young people when considering training. Graduate training schemes and apprenticeships may explain this, with most firms offering some form of training scheme. Graduates/apprentices/trainees are often employed at wage lower than their marginal productivity during the first few years of training. Once qualified, there is often a substantial rise in salary. This is commonplace in many industries e.g. medical, accountancy. The young worker is paying for part or all of their training by taking a salary below their marginal product. If the individual is myopic, they may choose to earn more in the short run by taking a higher starting salary, but in a job with little training or potential.

Young women may find it even trickier to receive job related training. Gender discrimination may have a negative impact on prospects of training for women. The 1995 Survey of Employer Provided Training showed that within a six month period, on average men received 46 hours training whilst women received 42.<sup>5</sup> A gap still exists but it is suspected to have narrowed more recently. Policy changes in maternity leave entitlement can have an impact on the amount of training offered to young women (Puhani & Sonderhof 2008). The study by Puhani and Sonderhof investigated the effect of the 1992 extension in maternity leave in Germany from 18 to 36 months. They found significant evidence to

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<sup>4</sup> Penelope Truck Blog – Advise at the Intersection of Work and Life, *"Make life more stable with frequent job changes"*, Date accessed: 11/01/12, <http://blog.penelopetrunk.com/2007/02/25/make-your-life-more-stable-by-changing-jobs-more-frequently/>

<sup>5</sup> Bureau of Labor Statistics, 1996, *"1995 Survey of Employer Provided Training – Employee Results"*, United States Labor Department, Date accessed: 12/01/12, <http://www.bls.gov/news.release/sept.nws.htm>

support the hypothesis that an extension to maternity leave entitlement will cause employer-offered training to fall. It was also observed that young women attempted to compensate for this by undertaking more training upon their own initiative. My case study supports this evidence, and is provided in the appendix.

Employers may be reluctant to offer training to a worker who is likely to be absent from work for an extended period, with no guarantee of their return. The phenomenon of 'Human Capital Depreciation' (Mincer & Ofek 1982) means the level of human capital declines whilst a worker is absent from the labour market. Therefore gains to marginal productivity through training may be lost if the employee temporarily withdraws themselves from the labour market. In the UK, approximately 17% of women have no children throughout their lifetimes. Employers may offer less training to young women since they have a greater chance of temporarily withdrawing themselves from the labour market. Since 17% of women never go on to have children (Portanti & Whitworth 2009), and therefore are not entitled to maternity leave, young women who go on to be 'childless' can be unfairly disadvantaged by statistical discrimination.

## 6. POLICY

Policy can be used as a tool to prevent or reduce the effects of discrimination in the labour market. In the UK the New Deal is a set of programmes to aid groups of people in the labour market that are suffering unemployment and other challenges. They offer advice and support for people in these circumstances. The New Deal for Young People (NDYP) is the largest scheme and focuses on young people that have been out of work for at least 6 months. They are offered chances to further develop their skills through full-time education and training, along with work experience through job placements and subsidised employment.<sup>6</sup> New Deal 50+ aims to help older workers to overcome barriers that may

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<sup>6</sup> Riley, R, & Young, G., 2000 *"New Deal for Young People: Implications for Employment and the Public Finances"*, National Institute of Economic and Social Research, Date accessed: 12/01/12, [http://www.niesr.ac.uk/pdf/140306\\_123853.pdf](http://www.niesr.ac.uk/pdf/140306_123853.pdf)



be restricting their ability to achieve employment. They may receive a working tax credit for one year, along with a grant of up to £1500 towards work related training.<sup>7</sup>

Since employers often provide a lower wage to workers in order to pay for job-related training, a working tax credit can encourage older workers to enter the labour market once again. Older workers may be forced to take a pay cut when re-entering the job market due to depreciation in their human capital (Mincer & Ofek 1962). Grants and subsidies can help towards training costs that would otherwise prevent employers or employees investing in training. The New Deal along with similar programmes are often criticised, since their methods of reducing unemployment are often achieved at the expense of earnings and employment stability (Beaudry 2002).

A training tax is a Government method of tackling the problem of under-investment in training. Firms are forced to pay a fixed percentage of their wage bill on training. In France, firms with more than 20 employees are forced pay a contribution of 1.6% of total wages and salaries as an investment into vocational training programmes<sup>8</sup>. In Australia, the Training Guarantee is a tax scheme that forces enterprises with a payroll greater than \$200,000, to spend 1.5% of their payroll on training.<sup>9</sup> Although this ensures that firms provide a certain level of training, particular groups may still face forms of discrimination. This may also cause a fall in the wages offered, due to firms passing the cost of training onto their employees.

## 7. CONCLUSION

My study has successfully found evidence of a positive relationship between training and earnings, and therefore emphasised the importance of removing discrimination from training decisions. My

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<sup>7</sup> Direct Gov, "*New Deal 50 Plus*", Jobseekers, Date accessed: 12/01/12, [http://webarchive.nationalarchives.gov.uk/+www.direct.gov.uk/en/Employment/Jobseekers/programmesandservices/DG\\_173728](http://webarchive.nationalarchives.gov.uk/+www.direct.gov.uk/en/Employment/Jobseekers/programmesandservices/DG_173728)

<sup>8</sup> PKF, "*France Tax Guide 2009*", Date accessed: 12/01/12, <http://www.pkfaudit.fr/docs/PKF%20Tax%20Guide%20France%202009.pdf>

<sup>9</sup> Freeman, R., 1994, "*Working Under Different Rules*", Russell Sage Foundation

descriptive statistics imply that there may be age discrimination when training is concerned, but I was unable to conduct the appropriate analysis to prove with evidence. I suggest an area of future study could be based around a Logit Loglinear analysis, with training as the dependent variable. This is necessary since training is a dummy variable. The case study has stimulated my interest in employees' perceived discrimination; particularly age discrimination. I suggest a study in a similar style to Snape and Redman's study into perceived age discrimination, but dedicated to the topic of training opportunities. This would provide an insight into a topic that is otherwise difficult to gather data around, i.e. employers will not openly admit to discriminate, even if their reasons appear justified. Finally, I have devised a model that calculates the equilibrium where gains to the firm equal the costs from training. This enables firms to adequately plan training schemes, and understand their economic viability. I hope this model can contribute to future studies into the costs and benefits of training.

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