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Returns to Intermediate and Low
Level Vocational Qualifications

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Research Brief: Returns to Intermediate and Low Level Vocational Qualifications - adding to the existing evidence base

Summary

This study was commissioned in 2010 to update our previous estimates of the returns to education and training, and to provide a baseline for the ongoing consistent analysis of the returns to vocational qualifications.

It adds to the weight of evidence showing positive employment and earnings returns for the vast majority of qualifications gained in adulthood, and contains some interesting findings around the circumstances in which more positive returns may occur. Important findings include:

Vocational qualifications - impact on earnings and employment

- In line with previous studies there continues to be large and significant wage gain for most vocational qualifications.
- There is an average 20% wage gain from possessing a BTEC level 3, 16% for RSA level 3, and 10% for NVQ level 3, compared to similar individuals qualified to level 2.
- The wage gain is lower for Level 2, 12% for BTEC, 16% for RSA, and 1% for NVQ Level 2, compared to similar individuals with qualifications below level 2.
- In line with previous research, there are strong positive returns to apprenticeships, 22% for a Level 3 apprenticeship and 12% for an apprenticeship at Level 2.
- All vocational qualifications are associated with increased likelihood of being in employment. Those with an NVQ at Level 3 are 15 percentage points more likely to be in employment and for Level 2 the figure is 13 percentage points, compared to those with lower qualification levels.
- The lifetime benefits associated with the acquisition of Apprenticeships at Level 2 and 3 are very significant, standing at between £48,000 and £74,000 for Level 2 and between £77,000 and £117,000 for Level 3 Apprenticeships.

Route and age of acquisition

- There is no longer any significant difference in the returns to NVQ qualifications at Level 2 or Level 3 according to whether they are gained in the workplace or through school/college, though theory and other evidence continue to support the greater value of employer directed training.
- The returns to NVQ qualifications at Level 2 and Level 3 when gained before the age of 25 are positive, and of a similar magnitude to other vocational qualifications at those levels. As such, the lower overall returns estimates to NVQs may reflect

the fact that a large proportion are taken by those who are over 30, when the estimated earnings returns are not as good.

Sector and occupation

- Returns to NVQs vary significantly by sector. There are more substantial returns for men in the traditional industries of manufacturing and construction. For women, stronger returns exist in office or service sectors
- There is also significant variation by occupation, with higher returns found in lower skilled occupations e.g. men working in skilled trades and machine operative occupations, and for females working in personal services.

Key findings

Change in marginal returns estimates over time

The most recent estimates of the returns to qualifications were contained in Jenkins and De Coulon (2007). Using the same methodology, London Economics have updated these estimates with the addition of more recent data, and the results are as shown in the table below:

Fig 1: Estimated returns to vocational qualifications at Level 2 and Level 3

	Jenkins & De Coulon (data from 1997-2006)	LE update using similar methodology (1996-2009)
BTEC Level 3	19%	20%
C&G Level 3	19%	15%
GNVQ/GSVQ (Advanced)	7%	7%
RSA Level 3	18%	16%
NVQ/SVQ Level 3	12%	10%
BTEC Level 2	14%	12%
C&G Level 2	7%	7%
GNVQ/GSVQ (intermediate)	1%	-1%
RSA Level 2	17%	14%
NVQ/SVQ Level 2	2%	1%

Note: Grey cell for GNVQ in later period denotes lack of statistical significance of the estimate

As can be seen from the table, the updated estimates are broadly similar to those in Jenkins & De Coulon (2007). The figures may suggest a slight decline, but it is difficult to judge how much of this can be explained by natural variation in the data. It will be interesting to see if the same holds true in future years.

The main finding is that, in line with previous research, there are large and significant returns to most vocational qualifications at level 2 and level 3.

Note that there are three aspects to the economic impact of holding a qualification:- earnings per hour worked, hours worked, and whether in work. Due to the methodology used, estimates in the table above show the combined impact on earnings per hour and hours worked. The later section on lifetime earnings combines all three aspects. Much of the main report focuses on earnings per hour, arguably the purer measure of labour productivity. The combined measures have greater policy relevance and so are the measures used in this headline summary.

Returns to apprenticeships

For apprenticeships, McIntosh (2007) found large earnings returns of around 18% to Level 3 apprenticeships and 16% to Level 2 apprenticeships. Replicating this methodology, London Economics find that the returns in the most recent data are now 22% and 12% respectively, suggesting that there has been a slight divergence in the returns at level 2 and level 3. The returns at Level 2 still remain high relative to other qualifications, at 12%, but given the planned expansions of apprenticeships both at level 2 and level 3 it will be interesting to see if this trend continues in future years.

Fig 2: Estimated returns to apprenticeships, relative to similar individuals who do not gain an apprenticeship:

	McIntosh (2007), based on data for 2004-05	LE update using similar methodology (2010), based on data for 2004-2009
Level 3 apprenticeship	18%	22%
Level 2 apprenticeship	16%	12%

Returns by route of acquisition

Previous studies have also suggested that the returns to NVQ Level 2 qualifications are higher when gained through the workplace. This was also in line with theoretical understanding - that skills gained through the workplace would be relevant and up-to-date - and with other evidence that the work-based route is particularly valuable. However, London Economics have looked at this question more extensively and have not been able to confirm the result - they find no significant difference in returns whether gained in the workplace or through school/college in the fuller data

In order to check this finding, they replicated the previous analysis, and it seems that over time there has been a real increase in the returns through school/college. There has also been a real decline in the returns to NVQs gained through the workplace, possibly due to the recent large expansion in NVQs gained in this manner through Train to Gain. The net effect is that there is now little difference between the school/college route and the work-based route.

The table below shows the estimated returns for those gaining NVQ2s relative to similar individuals with no qualifications, in the replicated analysis:

Fig 3: Estimated returns to NVQ2 qualifications, by route of acquisition

	1996-2002			2003-2009		
	Male	Female	Average*	Male	Female	Average*
Solely through school college etc	-10%	1%	-4.5%	4%	5%	4.5%
Solely at place of work	6%	7%	6.5%	1%	5%	3.0%
Workplace and educational institution	-8%	4%	-2.0%	0%	0%	0.0%
Government training	-21%	-13%	-17.0%	-8%	-3%	-5.5%

*'Average' figures here simply show the mid-points of the male and female estimates, to give a simpler way to compare over time, these are **not** the best estimates of the overall effect

Note: Grey cell denotes lack of statistical significance

The table shows that achieving NVQ2 through 'government training' is associated with lower pay than the average for people with no qualifications. That is probably because people on government training had to be long term unemployed, while many of those with no qualifications will be employable, skilled and well paid. So although the qualification will probably have improved the employment and earnings of those on government training over their position otherwise, it does not reach the average of those with no or low qualifications.

With the caveat that sample sizes are relatively small it appears there is little difference now in the recent data between workplace and college routes for NVQ level 2 qualifications - although other evidence suggests that learning vocational qualifications through the workplace is probably to be preferred when it is available.

London Economics also extend the analysis to look at the returns by route of acquisition to cover NVQ qualifications at Level 3 for the first time. As with the level 2 analysis though, they find no significant difference in the returns whether gained through school/college or through the workplace.

Returns by age of acquisition

In general, there appears to be some earnings advantage associated with gaining intermediate vocational qualifications below the age of 25. As an example, for those in possession of City & Guilds qualifications at Level 3 acquired below the age of 25, the average earnings premium ranges between 11% and 14% compared to those in possession of level 2 academic or vocational qualifications.

Although slightly lower, there continues to be a significant premium associated with gaining the qualification after the age of 25, where the returns range between 4% and 6%.

Fig 4: Estimated returns to qualifications at Level 3, by age of acquisition

Age	C&G	BTEC	NVQ
15-16	11%	12%	1%
17-18	11%	15%	9%
19-20	14%	15%	11%
21-25	14%	13%	11%
26-30	6%	12%	6%
>30	4%	7%	-1%

Note: Grey cell denotes lack of statistical significance

At Level 2 there is a similar pattern, with qualifications delivering the most value when acquired below the age of 30:

Fig 5: Estimated returns to qualifications at Level 2, by age of acquisition

Age	C&G	BTEC	NVQ
15-16	3%	-12%	1%
17-18	5%	7%	4%
19-20	12%	2%	4%
21-25	11%	10%	7%
26-30	9%	17%	0%
>30	6%	0%	-6%

Note: grey cells denote lack of statistical significance

For NVQs, it is striking that below age 25 the returns are positive and of similar magnitude to BTECs and City and Guilds qualifications. It is when taken at older ages that the returns seem to be much lower, particularly over the age of 30. This suggests that the flexibility allowed in the NVQ design for the qualification to be achieved by filling in gaps, rather than doing a full training course, could lead to lower economic value, whereas for younger learners it is more usual to apply the full training in any case. The fact that NVQs are predominantly taken by older adults (41% of those attaining them between 2001 and 2009 were aged 30+) may help to explain low overall returns estimates on average for NVQs.

Returns by occupation

For NVQ Level 2 qualifications, the research examines returns by *occupation*. The analysis presents earnings of people with NVQ2 as their highest qualification (and with no other Level 2), compared to individuals in those same occupations who have no qualification or qualification below Level 2.

The analysis indicates that the earnings premium associated with NVQ Level 2 qualifications varies significantly by occupation. Returns are positive for lower skilled occupations. For example, men earn a positive return from the qualification in the Skilled Trades occupations (5%), as Process, Plant and Machine Operatives (4%) and in Elementary Occupations (but not statistically significant), compared to those at Level 1.

Positive returns are not seen in the higher skill occupational groups, presumably because even individuals without qualifications in such jobs need to have a high level of skill, and for someone in such a group to take an NVQ2 suggests they might be in a relatively low skilled part of that occupation.

Fig. 6 – the returns to level 2 qualifications by occupation, compared to those at Level 1

	All	Males	Females
Managers and Senior Officials	-6%	-8%	-6%
Professional occupations	-6%	-5%	-9%
Associate Professional and Technical	-9%	-11%	-8%
Administrative and Secretarial	-2%	-3%	-3%
Skilled Trades Occupations	4%	5%	0%
Personal Service Occupations	4%	-2%	6%
Sales and Customer Service Occupations	-1%	-5%	0%
Process, Plant and Machine Operatives	3%	4%	-2%
Elementary Occupations	2%	2%	0%

Note: Grey cells indicate lack of statistical significance

Returns by sector

There is significant variation in the earnings returns achieved by individuals depending on the nature of the vocational qualification and the sector of employment. Previous studies have shown more substantial returns for men in the traditional industries of manufacturing and construction. For women, stronger returns have been seen in office or service sectors. The pattern here is similar.

For those in possession of City & Guilds qualifications at Level 3, the analysis suggests that the highest marginal returns (compared to Level 2 qualifications) exist in the Manufacturing sector (15%), though there are marginal returns in excess of 10% in the Energy and Water sector, Construction sector, Distribution sector and Transport and Communication sector. The returns are higher for men than for women across the majority of sectors.

For men in possession of National Vocational Qualifications, there are significant returns associated with employment in the Construction sector (16%). Relatively speaking, women appear to achieve strong benefits from NVQ Level 3 qualifications in the Manufacturing sector, and the Distribution, hotels and restaurants sector. As with the results more generally, women with RSA Level 3 qualifications achieve significant earnings premiums across most sectors of the economy.

Although there are also significant earnings returns associated with vocational qualifications at Level 2, there is probably slightly more variation in the returns than when considering Level 3 qualifications.

Fig 7 – marginal returns to L2 and L3 qualifications by sector

	Agriculture and Fishing	Energy and Water	Manufacturing	Construction	Distribution hotels and restaurants	Transport and Communication	Banking, finance and insurance	Public Admin, education and health	Other
RSA L2	-	59%	30%	5%	13%	9%	3%	17%	14%
C&G L2	4%	15%	11%	10%	8%	8%	3%	4%	1%
BTEC L2	8%	12%	3%	34%	8%	6%	3%	6%	12%
NVQ L2	-8%	1%	-1%	3%	0%	0%	-4%	-2%	4%
RSA L3	-	9%	10%	-5%	0%	21%	6%	7%	7%
C&G L3	-2%	14%	15%	12%	11%	12%	2%	5%	8%
BTEC L3	26%	21%	18%	18%	12%	17%	10%	8%	7%
NVQ L3	-2%	4%	5%	16%	7%	5%	1%	2%	11%

Note: grey cells indicate lack of statistical significance

Employment outcomes

For intermediate levels of vocational qualification, the analysis indicates that there is a strong and positive relationship between qualification attainment and the likelihood of being in employment with the association slightly more pronounced for women.

In particular, men in possession of Level 3 NVQs as their highest qualification are 9 percentage points more likely to be employed compared to a male in possession of Level 2 qualifications as a maximum, while women in possession of this qualification are approximately 17 percentage points more likely to be employed. For men, only City & Guilds qualifications offer a similar employment boost, while for women, NVQs have the greatest effect of any level 3 vocational qualification on female employment outcomes.

Fig 8 – employment returns to qualifications at Level 3

	All	Male	Female
RSA Level 3	6%	2%	7%
C&G Level 3	14%	11%	4%
BTEC Level 3	8%	5%	8%
NVQ Level 3	15%	9%	17%

Note: grey cells indicate lack of statistical significance

Similar (though less pronounced) employment outcomes are associated with qualification attainment at Level 2. The probability of someone with an NVQ2 being in employment is 6 percentage points higher for men, 13 points for women.

Fig 9 – employment returns to qualifications at Level 2

	All	Male	Female
RSA Level 2	9%	-5%	10%
C&G Level 2	12%	12%	3%
BTEC Level 2	9%	1%	11%
NVQ Level 2	13%	6%	13%

Note: grey cells indicate lack of statistical significance

However, it should be noted that, given the cross-sectional framework of the Labour Force Survey, the above figures show associations between qualifications and employment probability and it is not possible to say exactly how much is caused by possessing the qualification. Other studies judge that about a half of the improvement in employment probability is due to the qualification, and that is what has been assumed below in estimating lifetime benefits (NPV).

Lifetime earnings (NPV) for an individual from gaining a qualification or apprenticeship

This section of the report brings together all sources of economic benefit to an individual, i.e. the impact on their earnings, hours worked and employment chances, into total estimated benefit. Full costs are taken into account, including lost output while training, as are average discounted benefits. This section covers costs and benefits for individuals, and the next for the Exchequer.

The lifetime benefits associated with the acquisition of Apprenticeships at Level 2 and 3 are very significant, standing at between £48,000 and £74,000 for Level 2 and between £77,000 and £117,000 for Level 3 Apprenticeships.¹

Fig. 10 NPV benefits of apprenticeships at level 2 and level 3

	NPV
Level 2 apprenticeship	£48,324 - £74,387
Level 3 apprenticeship	£76,990 - £117,337

The net present value of the lifetime benefit associated with Level 3 vocational qualifications stands at between £37,000 (for NVQ Level 3, under most pessimistic assumptions) and approximately £89,000 (for BTEC Level 3 qualifications, under most optimistic assumptions). For Level 2 qualifications, the lifetime benefits range between £35,000 and £57,000 (for BTEC qualifications) and between £42,000 and £71,000 (for City & Guilds qualifications). The net benefit associated with NVQ Level 2 qualifications is slightly lower and stands at between £18,000 and £42,000, primarily due to the employment impact.

¹ The range presented reflects different assumptions relating to the proportion of the employment effect that is attributed to the particular qualification. The lower estimate reflects an assumption that 50% of the employment benefit is attributed to the qualification¹, following the approach of McIntosh (2007), while the higher estimate is based on an assumption that 100% of the employment gain is a result of obtaining the qualification

Fig. 11 NPV benefits to vocational qualifications at Level 2 and Level 3

	City & Guilds	BTEC	NVQ
Level 2	£42,353 - £70,699	£35,138 - £56,571	£17,728 - £42,441
Level 3	£55,281 - £88,967	£44,906 - £63,801	£36,848 - £66,593

Exchequer benefits

The research finds that the Exchequer also achieves strong positive returns from the majority of vocational qualifications², with particularly high returns associated with Level 3 qualifications.

For apprenticeships, there is a return to the exchequer of between £31,000 and £48,000 at Level 2, and between £56,000 and £81,000 for Level 3 apprenticeships.

Fig 12 – Exchequer benefits to apprenticeships.

	NPV
Level 2 apprenticeship	£31,484 - £47,540
Level 3 apprenticeship	£55,632 - £80,661

There are strong returns to the Exchequer from the provision of a number of vocational qualifications at Level 3. NVQs at Level 3 deliver returns to the exchequer of between £21,000 and £36,000, and even higher returns for BTEC and City and Guilds. The analysis also demonstrates strong returns at level 2, with benefits ranging from £26,000 to £42,000 for City & Guilds Level 2, and £20,000-£32,000 for BTECs at Level 2. NVQs at Level 2 fare less well but still deliver positive returns to the exchequer.

Fig 13 – Exchequer benefits to vocational qualifications at level 2 and Level 3

	City & Guilds	BTEC	NVQ
Level 2	£25,633 - £41,830	£19,748 - £32,154	£3,308 - £17,276
Level 3	£29,654 - £47,748	£27,311 - £38,108	£20,514 - £36,355

Conclusion

This report provides a comprehensive summary of the economic returns to vocational qualifications at Level 2 and Level 3, adding to and extending our knowledge in this area. The research confirms the positive employment and earnings benefits to individuals (and

² Calculated using the up-front costs of supporting qualification attainment, and the change in tax revenues associated with qualification attainment.

to the exchequer) from gaining most vocational qualifications, whilst highlighting some important trends that will need to be monitored closely as programmes are expanded in future years.

Further Education and Skills Analysis Team, BIS

Returns to Intermediate and Low Level Vocational Qualifications

Final Report



About London Economics

London Economics is one of Europe's leading specialist economics and policy consultancies and has its head office in London. We also have offices in Brussels, Dublin, Cardiff and Budapest, and associated offices in Paris and Valletta.

We advise clients in both the public and private sectors on economic and financial analysis, policy development and evaluation, business strategy, and regulatory and competition policy. Our consultants are highly-qualified economists with experience in applying a wide variety of analytical techniques to assist our work, including cost-benefit analysis, multi-criteria analysis, policy simulation, scenario building, statistical analysis and mathematical modelling. We are also experienced in using a wide range of data collection techniques including literature reviews, survey questionnaires, interviews and focus groups.

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Summary

London Economics were commissioned by the Department for Business, Innovation and Skills to undertake an analysis of the economic returns associated with intermediate and low level vocational qualifications. The analysis used information from the 1970 British Cohort Study and the Labour Force Survey between 1996 and 2009 to assess the impacts of vocational qualifications on earnings, as well as the probability of being employed. The analysis covers the United Kingdom, with the exception of the outcomes associated with apprenticeships, where the analysis was restricted to England only.

Following the research work undertaken by McIntosh (2002, 2007), Dearden *et al* (2004) and De Coulon *et al* (2007), this work considered both the marginal and the average returns to intermediate and low level vocational qualifications, where the *marginal returns* estimates the earnings enhancement achieved when the vocational qualification is the highest qualification, and the *average return* assesses the earnings premium associated with a qualification when all qualifications are considered. We also estimated a number of average employment outcomes, as well as providing a detailed disaggregated analysis of the returns to vocational qualifications according to gender, age, place of acquisition, qualification level and type, and place of acquisition.

In addition to this, through the combination of information on the costs and benefits achieved by individuals and the Exchequer, we also estimated the economic *rates of return* associated with acquisition of intermediate and low level vocational qualifications. It is important to note that the analysis presented here was not commissioned to consider a specific outcome achieved by a particular group of individuals in possession of vocational qualifications, rather to provide a baseline for the ongoing consistent analysis of the returns to vocational qualifications.

Key findings

- In general, this report adds to the wealth of existing evidence showing the generally positive impact of training and qualifications on employment and earnings.
- As with some previous research, the main exception to this is that the estimates show negative earnings returns (on average) for lower level National Vocational Qualifications (at levels 1 and 2). Negative estimates do not necessarily imply that a qualification actually reduces an individual's human capital or earnings power. It is likely instead that there are fundamentally different characteristics between the treatment and control

groups that cannot be captured by the data³. That said, the finding that lower level NVQs continue to be associated with lower paid jobs on average is an important one in itself.

- Although the results relating to earnings returns are sometimes lower compared to other estimates in the field (Jenkins *et al* (2007)), our replication of these previous studies indicates that approximately two-thirds of the change in the return is as a result of methodological differences.
- The report does highlight areas in which the overall returns to NVQs Levels 1 and 2 are positive, such as:
 - In the construction sector;
 - in certain occupations - Skilled Trades, and Process Plant and Machinery operatives; and
 - for those who are at the lower end of the earnings distribution (bottom quartile)

The research also finds that NVQ qualifications at Levels 1 and 2 are associated with a significantly higher probability of being in employment, in line with previous research.

- There are strong positive earnings returns associated with apprenticeships. Compared to individuals in possession of Level 2 qualifications, the marginal return associated with an Advanced apprenticeship is approximately 13%. Compared to individuals in possession of either Level 1 or Level 2 qualifications; there is an 8% marginal earnings return associated with Foundation apprenticeships.
- Although these apprenticeship results are lower than those presented by McIntosh (2007), the difference is explained by the methodological differences between the two reports, rather than by a fall in returns to apprenticeships over time. Specifically, the use of hourly earnings for the main part of the research rather than weekly earnings (as in McIntosh) appears to significantly alter the estimates, which implies that apprenticeships have a positive impact on hours worked. Estimates using weekly earnings in this report show the marginal return associated with an Advanced apprenticeship is around 18%, with a return of approximately 10% for Foundation apprenticeships.
- This research does not find a significant difference in the returns to vocational qualifications according to the route of acquisition. Adopting the methodological approach of Dearden *et al* (2004), the analysis indicates that over time, the route of NVQ Level 2 qualification acquisition has become much less important in determining the earnings of those acquiring the qualification, and that earnings premiums have become independent of the route of acquisition. These results may have significant policy implications.
- In general, there appears to be some earnings advantage associated with gaining intermediate vocational qualifications below the age of 25. As an example, for those in possession of City & Guilds qualifications at Level 3

³ See, for example, the discussion of potential negative biases in returns estimates for lower level vocational qualifications contained in McIntosh, S., (2009), "The economic value of intermediate vocational education and qualifications", UK Commission for Employment and Skills Evidence Report 11, December 2009.

acquired below the age of 25, the average earnings premium ranges between 10% and 13% compared to those in possession of level 2 academic or vocational qualifications. Although slightly lower, there continues to be a significant premium associated with gaining the qualification after the age of 25, where the returns range between 5% and 6%.

- The lifetime benefits associated with the acquisition of apprenticeships are very significant, standing at between £48,000 and £74,000 for Foundation apprenticeships and between £77,000 and £117,000 for Advanced level apprenticeships.
- The net present value of the lifetime benefit associated with Level 3 vocational qualifications stands at between £37,000 (for NVQ Level 3) and approximately £89,000 (for BTEC Level 3 qualifications). For Level 2 qualifications, the lifetime benefits range between £35,000 and £57,000 (for BTEC qualifications) and between £42,000 and £71,000 (for City & Guilds qualifications). The net benefit associated with NVQ Level 2 qualifications is slightly lower standing at between £18,000 and £42,000.
- The Exchequer achieves strong positive returns from the majority of vocational qualifications, with particularly high returns associated with Level 3 qualifications. For these qualifications, the net present value of the benefits ranges from £21,000 to £36,000 for NVQ Level 3 qualifications to between £56,000 to £81,000 (for Advanced apprenticeships), with the rate of return ranging from 20% to 29% for NVQs and 27% to 33% for Advanced apprenticeships.

More detailed findings by section

Marginal earnings outcomes

- The findings illustrate that the returns to Level 3 vocational qualifications are generally significant compared to all the various comparison groups. Individuals in possession of BTEC Level 3 qualifications achieve a 34% earnings premium over those in possession of no formally recognised qualifications. The lowest (though still generally positive) marginal returns associated with Level 3 vocational qualifications are posted by those in possession of NVQ Level 3 qualifications (15% compared to those with no formally recognised qualifications). Men generally achieve higher returns to intermediate vocational qualifications compared to women.
- The marginal returns associated with level 2 vocational qualifications are relatively strong in general compared to those in possession of no formally recognised qualifications, with individuals in possession of RSA Level 2, City & Guilds Level 2 and BTEC Level 2 qualifications achieving 38%, 16% and 13% premiums (respectively) over those with no qualifications. BTEC Level 2 and RSA Level 2 qualifications offer a premium compared to individuals in possession of 5 or more GCSEs at grades A*-C, while individuals in possession of NVQ Level 2 qualifications struggle to achieve any earnings return over those with no formally recognised qualifications, and earn 2%

less compared to those in possession of Level 1 academic and/or vocational qualifications.

- With the exception of NVQ Level 1 qualifications, across men and women, vocational qualifications at level 1 generally offer a positive return compared to possession of no formally recognised qualifications (between 9% and 18% respectively). Women in possession of RSA qualifications perform particularly well and post 20% returns, while City & Guilds and BTEC qualifications provide the best earnings returns at this level to men (up to 20% in the case of BTECs)
- It is important to note that this analysis is dependent on the appropriateness of the counterfactual. Although we have generated a number of comparison groups, it is difficult to imagine that the possession of additional qualifications actually results in an earnings penalty compared to an identical individual not in possession of the qualification in question. Where negative returns are estimated, this may suggest that the counterfactual or comparison group does not accurately capture a number of unobserved characteristics or that there is some form of signalling phenomenon occurring.

Returns by sector

- There is significant variation in the earnings returns achieved by individuals depending on the nature of the vocational qualification and the sector of employment. For those in possession of City & Guilds qualifications at Level 3, the analysis suggests that the highest marginal returns (compared to Level 2 qualifications) exist in the Manufacturing sector (almost 15%), though there are marginal returns in excess of 10% in the Energy and Water sector, Construction sector, Distribution sector and Transport and Communication sector. The returns are higher for men than for women across the majority of sectors.
- For men in possession of National Vocational Qualifications, there are significant returns associated with employment in the Construction sector (16%).
- Relatively speaking, women appear to achieve strong benefits from NVQ Level 3 qualifications in the Manufacturing sector, and the Distribution, hotels and restaurants sector. As with the results more generally, women with RSA Level 3 qualifications achieve significant earnings premiums across most sectors of the economy.
- Although there are also significant earnings returns associated with vocational qualifications at Level 2, there is probably slightly more variation in the returns than when considering Level 3 qualifications. At Level 1, although there are some sectors that demonstrate strong returns for vocational qualification holders, it was those individuals in possession of City & Guilds and BTEC qualifications that were most likely to capture these returns; however, individuals in possession of NVQ Level 1 qualifications did appear to achieve significant earnings premiums in the Construction industry (11%).

Returns by occupation

- We have also undertaken an analysis of the returns to NVQ Level 2 qualifications by occupation. The analysis presents the earnings return associated with a NVQ Level 2 qualification for given occupations compared to individuals who are in those same occupations without the NVQ Level 2.
- The analysis indicates that the earnings premium associated with NVQ Level 2 qualifications varies significantly by occupation, and, while there is also variation by gender, we can identify a common pattern for males and females in the distribution of returns to NVQ Level 2 by occupation. In fact, earnings returns for NVQ level 2 have a negative sign for both men and women in a number of 'higher grade' occupations including Managers and Senior Officials, Professional occupations, Associate Professional and Technical occupations and Administrative and Secretarial occupations.
- On the other hand, in some occupations, individuals in possession of an NVQ level 2 experience positive earnings returns. In fact, men earn a positive return from the qualification (relative to Level 1 qualifications) in the Skilled Trades occupations (4.5%), as well as Process, Plant and Machine Operatives (3.8%) and Elementary Occupations (although not statistically significant).

Route of acquisition

- For NVQ Level 3 qualifications, although there is in general a positive return associated with the qualification attainment irrespective of the mode, for those individuals acquiring the qualification through a combination of workplace and classroom based learning, the returns are the greatest. This is especially the case for men, where the acquisition of the qualification through a combination of modes provides them with a return of approximately 23% compared to a return of 15% when the qualification is acquired through a classroom based route only, and 12% when the qualification is workplace based only. This result is replicated when we consider City & Guilds qualifications at Level 3 (though with much less variance).
- In relation to route of acquisition of National Vocational Qualifications at Level 2, the results indicate that for men, the mode of acquisition of NVQ Level 2 qualifications was relatively insignificant. Men acquiring NVQ Level 2 qualifications solely through the classroom route earn 4% less compared to level 1 qualifications, while men who obtain a NVQ Level 2 solely through the work route or through a combination of work and the classroom achieve no earnings benefit.
- Women who acquired a NVQ Level 2 through the combined route earn 9% less compared to those with no formally recognised qualifications, while women gaining the qualification solely through the workplace earn 3% less.
- Given some of the previous work in the field and the differences between our results and those presented by other authors, we replicated the Dearden

- et al* (2004) analysis. When considering the same time period (1996-2002), we achieved a very high degree of consistency in the results generated
- Given this consistency of results, we replicated the Dearden *et al* (2004) approach for the period 2003-2009. The results are very significant. The analysis illustrates that (compared to no formally recognised qualifications), the negative returns posted by men acquiring NVQ Level 2 qualifications solely through the classroom route between 1996 and 2002 disappear. Women acquiring NVQ Level 2 qualifications solely through the classroom route now achieve a 5% earnings premium compared to a statistically insignificant earnings return previously.
 - For men, the positive return associated with the workplace route of acquisition and the lower estimated returns associated with the combined route both disappear, while the lower earnings returns achieved by women acquiring qualifications through government training are also eliminated. Adopting the methodological approach of Dearden *et al* (2004), the analysis indicates that over time, the route of NVQ Level 2 qualification acquisition has become much less important in determining the earnings of those acquiring the qualification, and that earnings premiums have become independent of the route of acquisition. These results may have significant policy implications.

Age of acquisition

- In general, at intermediate levels of qualification attainment, there appears to be some earnings advantage associated with gaining the qualifications below the age of 25. As an example, for those in possession of City & Guilds qualifications at Level 3 acquired below the age of 25, the average earnings premium ranges between 10% and 13% compared to those in possession of level 2 academic or vocational qualifications. Although slightly lower, there continues to be a significant premium associated with gaining the qualification after the age of 25, where the returns range between 5% and 6%.
- The analysis indicates that for both men and for women, there appears to be a positive return associated with obtaining NVQ Level 3 qualifications earlier in life. For men who obtained the qualification between the ages of 17 and 25, there is a return of between 10% and 18% compared to those in possession of Level 2 qualifications, while men who obtained the qualification between the ages of 26 and 30 achieve a 10% return. This compares to men who achieve a zero return if they gained the qualification above the age of 30.

Earnings variations

- As part of the analysis, we also considered how earnings returns varied at different points across the income distribution (by estimating quantile regressions) and by occupation. The analysis demonstrated that the return to National Vocational Qualifications at Level 2 is greater for those at the lower end of the earnings spectrum compared to those in the middle or higher end of the earnings spectrum. Specifically, the return to a NVQ Level

2 at the median is statistically insignificantly different from zero; however, the return on the 25th percentile stands at 2% compared to the return on the 75th percentile standing at -2%.

- There are gender effects. At the median of the income distribution, men post an earnings premium of more than twice that generated on average (compared to a statistically insignificant return for women), while women on the 75th percentile account for the relatively poor aggregate returns, earning 5% less compared to a statistically insignificant return for men.

Employment outcomes

- For intermediate levels of vocational qualification, the analysis indicates that there is a strong and positive relationship between qualification attainment and the likelihood of being in employment with the association slightly more pronounced for women.
- In particular, men in possession of Level 3 NVQs as their highest qualification are 9 percentage points more likely to be employed compared to a male in possession of Level 2 qualifications as a maximum, while women in possession of this qualification are approximately 17 percentage points more likely to be employed. For men, only City & Guilds qualifications offer a similar employment boost, while for women, NVQs have the greatest effect of any level 3 vocational qualification on female employment outcomes.
- Similar (though less pronounced) employment outcomes are associated with qualification attainment at Level 2. The probability of men with a NVQ Level 2 being in employment is 6 percentage points higher, while women are approximately 13 percentage points more likely to be employed relative to the comparison group.
- At level 1, vocational qualification attainment again appears to have a significant impact on the employment outcomes of women. Women are approximately 14 percentage points more likely to be employed if they possess a RSA Level 1 qualification or 11 percentage points if in possession of a NVQ Level 1 qualification. Men in possession of a City & Guilds qualification at Level 1 are almost 10 percentage points more likely to be employed compared to men in possession of no formally recognised qualifications. Men in possession of NVQ Level 1 qualifications are approximately 3 percentage points more likely to be employed.
- However, it should be noted that, given to the cross-sectional framework of the Labour Force Survey, the above figures may show associations between qualifications and employment probability and we are unable to firmly attribute any causality effect to these associations.

Apprenticeships

- The econometric results suggest that there is a positive earnings return associated with apprenticeships. Compared to individuals in possession of Level 2 qualifications, the marginal return associated with an Advanced

apprenticeship is approximately 13%. This compares relatively favourably to the return associated with a traditional apprenticeship, where the return stands at approximately 4%. Men post a statistically significant return of approximately 18% to an Advanced apprenticeship compared to a return of 2% for women.

- The analysis illustrates that compared to individuals in possession of either Level 1 or Level 2 qualifications; there is an 8% marginal earnings return associated with Foundation apprenticeships. This is slightly higher than the return achieved by those in possession of recognised trade apprenticeships (7%).
- The estimates indicate that there are significant employment returns associated with all forms of apprenticeship. Individuals in possession of recognised trade apprenticeships are 9% more likely to be employed compared to individuals in possession of Level 2 academic or vocational qualifications, while individuals in possession of Advanced apprenticeships are almost 14% more likely to be employed. However it should be noted again that, given to the cross-sectional framework of the Labour Force Survey, we are unable to attribute any causality effect to the association between apprenticeships and employment probability.
- Possession of a Foundation apprenticeship provides a 10 percentage point employment boost compared to an enhanced likelihood of being employed of 5 percentage points for those holding a traditional trade apprenticeship.
- Although these results are lower than those presented by McIntosh (2007), the difference is likely to be explained by methodological differences between the analyses, rather than by a fall in returns to apprenticeships over time. Specifically, the use of hourly earnings in our research rather than weekly earnings (as in McIntosh) appears to significantly alter the estimates, implying that apprenticeships have a positive impact on hours worked.

Lifetime benefits and rates of return to the individual

- The net present value of the lifetime benefit associated with Level 3 vocational qualifications stands at between £37,000 (for NVQ Level 3) and £89,000 (for BTEC Level 3 qualifications). For Level 2 qualifications, the lifetime benefits range between £35,000 and £57,000 (for BTEC qualifications) and between £42,000 and £71,000 (for City & Guilds qualifications). The net benefit associated with NVQ Level 2 qualifications is slightly lower and stands at between £18,000 and £42,000. Under the assumption⁴ that the earnings and premiums and enhanced employment outcomes are non-negative, the lifetime earnings benefit associated with National Vocational Qualifications increases by approximately £7,000.
- For Level 1 qualifications, the benefits associated with City & Guilds qualifications range between £36,000 and £60,000, while the benefits

⁴ We have presented this alternative scenarios as it has been suggested that the possession of any qualification cannot reduce either earnings or the probability of being employed relative to a proper counterfactual (i.e. that same individual without the qualification in question), and that negative earnings returns or reduced probabilities of being in employment must be as a result of fundamentally different characteristics between the treatment and control groups

associated with NVQs are again lower (standing at between £14,000 and £32,000).

- The lifetime benefits associated with the acquisition of apprenticeships at Foundation and Advanced level are very significant, standing at between £48,000 and £74,000 for Foundation apprenticeships and between £77,000 and £117,000 for Advanced level apprenticeships.
- Men achieve higher lifetime benefits from the acquisition of intermediate and low level vocational qualifications compared to women, although women do post significant returns from attaining RSA qualification at all levels (between £44,000- £76,000 at Level 1 and between £28,000 and £45,000 at Level 3).
- The range of all these estimates depends on the assumption used for the employment effect of the qualifications, with the lower estimate reflecting an assumption that 50% of the employment benefit is attributed to the qualification, while the higher estimate is based on an assumption that 100% of the employment gain is a result of obtaining the qualification.

Exchequer benefits and rates of return

- The Exchequer achieves strong positive returns from the majority of vocational qualifications, with particularly high returns associated with Level 3 qualifications. For these qualifications, the net present value of the benefits range from £21,000 to £36,000 for NVQ Level 3 qualifications to between £56,000 to £81,000 (for Advanced apprenticeships), with the internal rate of return ranging from 20% to 29% for NVQs and 27% to 33% or Advanced apprenticeships.
- The benefits associated with Level 1 and Level 2 qualifications are also generally positive, although NVQ Level 1 and Level 2 qualifications offer returns that are lower (between £3,000 and £13,000 and £4,000 and £17,000 respectively).
- There are strong returns to the Exchequer from the provision of a number of vocational qualifications at Level 2. The analysis demonstrates returns of £34,000 and £49,000 for City & Guilds and £33,000 and £48,000 for apprenticeships (equivalent to a rate of return of between 11% and 14%). However, NVQs fare less well. In particular, the return to a NVQ Level 2 qualification is particularly low for men (ranging between -£11,000 and -£7,000).
- The net present value associated with City & Guilds, NVQs and apprenticeship qualifications acquired by women is particularly small, with low estimates associated with NVQs and City & Guilds qualifications at Level 1 and Level 2 (and Level 3 in the case of City & Guilds). Even assuming non-negative earnings returns and employment probabilities, the Exchequer benefit remains less than £15,000.
- The only qualification offering consistent positive returns to women are RSA qualifications, which provide the Exchequer with a benefit of between £21,000 and £37,000 at Level 1 and £16,000 to £26,000 and Level 2, while BTEC qualifications deliver an Exchequer benefit of between £7,000 and £20,000.

1. Introduction and Terms of Reference

London Economics were commissioned by the Department for Business Innovation and Skills to undertake an assessment of the economic returns to intermediate and low level vocational qualifications. There have been a large number of studies in the area that have focused on a range of different aspects of vocational qualifications, including the determinants of undertaking vocational qualifications, the earnings and employment outcomes associated with vocational qualifications (both at an aggregated or disaggregated level), and the rates of return associated with different levels and types of vocational qualification. To undertake this research and analysis, a large number of alternative data sets and model specifications have been considered.

In this report, we consider the economic returns associated with vocational qualification attainment. Following a number of leading authors in the field, we have adopted a series of standard economic and econometric approaches to assess the economic benefits associated with intermediate and low level vocational qualification attainment. The data sources and approaches we have used to undertake this analysis are detailed in Section 0 of this report. In Section 0, we present detailed findings of the **marginal** earnings returns associated with different levels and types of vocational qualification attainment, where the marginal earnings estimates provide an indication of the returns associated with different qualifications when these qualifications are the highest qualification the individual is in possession of. This analysis is presented on an aggregated and disaggregated basis, and we consider the marginal returns by age, gender, age of qualification attainment, place of acquisition and sector of employment. We also undertake some quantile regression analysis to illustrate the potential variation in the returns to vocational qualifications across the earnings distribution.

In Section 0 of this report, we present information on the **average** returns associated with intermediate and low level vocational qualification attainment, where the average return assesses the return associated with the qualification for anyone in possession of that qualification (irrespective of whether it is their highest qualification or otherwise). In section 0 and Section 0 of the report, we replicate the analyses presented in Section 0 and Section 0 but consider the impact of vocational qualifications on the probability of being employed. In section 0, we provide a marginal analysis of economic outcomes associated with Apprenticeships.

The analysis presented in Sections 0 to 0 are all based on information from pooled Labour Force Survey data between 1996 and 2009. In Section 0, as an alternative approach we undertake an assessment of the economic returns to vocational qualifications using information from the British Cohort Study 1970, and specifically

ask whether the acquisition of qualifications later in life has had an impact on earnings.

Finally, in Section 0, by combining the economic benefits and costs to the individual and the Exchequer, we provide an assessment of the economic rates of return associated with vocational qualification attainment. This is undertaken for the individual (Section 0) and Exchequer (Section 0).

2. Methodology

In this section, we provide a summary of the methodological approach adopted throughout the various analyses.

2.1 Estimating earnings returns using the Labour Force Surveys

Throughout the analysis, we have adopted a standard Ordinary Least Squares linear regression model, where the dependent variable is the natural logarithm of hourly earnings and the independent variables includes a range of personal, regional and job related characteristics that might be expected to influence earnings. Although there may generally be a number of biases in the specification of a model of this nature, the work of Dearden⁵ (1999) has presented strong evidence to illustrate the fact that OLS regression specifications remain a good estimator of the earnings associated with qualification attainment (the various biases generally negate each other). This approach has been used widely in the academic literature. The basic specification of model was as follows (in aggregate and for men and women separately):

$$\ln(\omega_i) = \alpha + \beta' X_i + \varepsilon_i \quad \text{for } i = 1 \text{ to } n$$

where $\ln(\omega_i)$ represents the natural logarithm of hourly earnings, X_i provides the independent variable included in the analysis as follows:

- Age
- Age squared
- Gender
- Ethnic origin
- Region of usual residence
- Qualification
- Marital Status
- Number of dependent children under the age of 16
- Temporary or permanent contract
- Public or private sector employment
- Interaction terms and
- Yearly/Seasonal Dummies

Following McIntosh (2002, 2007), we focused our analysis of the Labour Force Survey on the sample of full-time workers only.

⁵ Dearden, L. (1999), "Qualifications and Earnings in Britain: How reliable are conventional OLS estimates of the returns to education" Royal Economic Society Annual Conference, March 1999.

Alternative returns

We have undertaken a number of model specifications using different classifications of qualification attainment. In particular, we have considered the economic returns to the highest level of qualification in order to assess the **marginal** return to the qualification in question. In addition, given the fact that the LFS asks for information on all the qualifications that the individual is in possession of, we have also estimated the **average** returns associated with low level academic and vocational qualifications.

Coefficients

Specifically, in the relevant specification, the β coefficients in the model provide information on the extent to which a particular independent variable influences the dependent variable. In the model specifications presented here, it is necessary to compare the earnings outcomes with a reference or comparison group. In this analysis, we have estimated the returns to intermediate and low level vocational qualifications relative to a range of comparison groups including individuals in possession of no formally recognised qualifications, individuals in possession of 5 or more GCSEs at grades A*-C, and individuals in possession of certain (lower or equivalent) levels of academic and/or vocational qualifications. These comparison groups are detailed explicitly in each of the tables presenting the results.

The coefficients relating to the alternative vocational qualifications indicate the extent to which the log of hourly earnings achieved by those in possession of different qualification exceed those in the reference category (e.g. those with level 2 qualifications)⁶. The final term ε_i represents an error terms that is included in every model specification. In the various tables later in the report, the actual coefficients from the regression are presented, while in the text, the precise effect when the dependent variable is in log form is provided (by transforming the coefficient using the transformation $e^\beta - 1$). In general terms, for small coefficients (less than 0.1), the coefficient in the regression model will give a reasonable approximation of the actual percentage change; however, for coefficients greater than this, the correction is necessary.

General interpretation

It is important to note that when considering the results, the estimates relating to the marginal returns are likely to exceed the estimates associated with average returns. The reason for this is that marginal returns assess the returns associated with the highest level of qualification (compared to 'no qualifications' for instance),

⁶ The interpretation of the estimated coefficients from the wage equation depends upon the control group used. In this case, we are interested in the wage gain from completing an apprenticeship, compared to what individuals would have earned had they not undertaken and completed the apprenticeship. It is assumed that individuals completing a level 3 apprenticeship, or any apprenticeship of unknown level, would have had level 2 qualifications (5 or more GCSEs at grade C or above or a vocational qualification at level 2) before starting an apprenticeship, and so would have remained at level 2 had they not obtained the apprenticeship. Thus, the sample upon which the equation is estimated is all those in the Labour Force Survey whose highest qualification is an apprenticeship, or whose highest qualification is at level 2. Therefore the interpretation of the estimated returns to apprenticeship is the additional earnings that an individual receives if they have completed an apprenticeship and this represents their highest qualification, compared to an individual with the same observed characteristics whose highest qualification remains at level 2.

while the average returns estimate the earnings premium achieved by anyone in possession of that qualification (including individuals with higher level qualifications who might have a low return associated with the vocational qualification, and individuals with no other formally recognised qualifications where the return may be higher).

2.2 Estimating employment returns using the Labour Force Surveys

We have estimated a range of probit models to assess the different likelihood of different qualification holders being in employment or otherwise. As per the standard ILO definition of employment, we will define an individual's labour market outcome to be either in employment (working for payment or profit for more than 1 hour in the reference week) or not in employment (being either unemployed or economically inactive).

The specification of the probit model was as follows (in aggregate and for men and women separately):

$$\text{probit}(EMPNOT_i) = \alpha + \gamma'Z_i + \varepsilon_i$$

The dependent variable adopted was the binary variable *EMPNOT*, which was coded 1 if the individual was in employment and 0 otherwise. As in the previous model, we specified the model to contain a constant terms as well as a number of independent variables as follows:

- Age
- Age squared
- Gender
- Ethnic origin
- Region of usual residence
- Qualification
- Marital Status
- Number of dependent children under the age of 16 and
- Yearly/seasonal Dummies

In addition to the consideration of employment outcomes, we have also undertaken a number of model specifications where we have considered the impact of qualification attainment on being employed, but also the change in the probability of being in full time employment. The different model specifications are presented explicitly throughout the report.

2.2.1 Labour Force Survey Data

In general, we have used Labour Force Survey information between 1996 and 2009 where available. In each year, we have merged each of the four quarters of

LFS data to increase the available sample size and include yearly/seasonal dummies in the analysis to remove the possible impact of annual wage inflation or other time trends that might bias the results. The Labour Force Survey is made up from a revolving panel of respondents with 20% of respondents dropping out each quarter (having participated in the survey for the 5th consecutive quarter (Wave 1 to Wave 5)) and replaced by a new wave of participants (Wave 1). Given the fact that respondents participate in 5 separate quarters, and that income questions are asked only of individuals in Wave 1 and Wave 5, we ensure that duplicate earnings information from Wave 1/Wave 5 respondents are removed.

Caveats

It is important to note that there are a number of significant issues relating to the availability and comparability of some of the Labour Force Survey over time. In particular, we have noted that in 2005/2006 there was a fundamental change in the administration and collection of Labour Force Survey data following the movement from seasonal to quarterly data. In particular, information relating to a number of the variables (including the location where the qualification was attained) prior the change in data collection method became unavailable on a consistent basis, making some comparisons with previous academic work difficult.

2.3 Assessing employment and earnings outcomes using the British Cohort Study

In a separate element of the analysis, we estimate the returns associated with low level vocational qualifications using the results of multiple waves of the British Cohort Study (1970 cohort). This allows us to form a longitudinal dataset including information on the same individuals at different points in time. Further, in earlier waves the BCS70 also collected information relating to family background, ability (in the form of test score performance) and learning. As such, this data allows us to control for additional factors in comparison to the analysis based around the LFS dataset.

Similar to the analysis undertaken by De Coulon and Vignoles (2007), our analysis focuses on the BCS surveys completed in 1996, 2000, and 2004 (incorporating relevant variables from previous waves)⁷. This allows us both to estimate the returns achieved by individuals holding vocational qualifications at three different points in time. Further, the nature of the dataset allows us to use panel-data techniques to control for individual-specific factors affecting wages and employment outcomes that may remain fixed over time (such as motivation).

Average earnings returns

Average returns were estimated in terms of net hourly earnings in each of 1996, 2000 and 2004; and in terms of gross hourly earnings in 2000 and 2004. As before, the basic specification of the model used was:

⁷ Although the fieldwork for the age-38 follow up has been completed (in 2008/09), at the time of the research, the results had not been deposited with the Essex Data Archive.

$$\ln(\omega_i) = \alpha + \beta' X_i + \varepsilon_i \quad \text{for } i = 1 \text{ to } n$$

where $\ln(\omega_i)$ represents the natural logarithm of hourly earnings, X_i provides the independent variables included in the analysis and ε_i represents an error term. As in the LFS analysis, the comparison group is limited to those with a highest academic qualification of level 2 (or below) and a highest vocational qualification of level 3 (or below).

In each case, two separate specifications were estimated. The first specification included a relatively “standard” set of control variables, similar to that included in the estimates based on the LFS dataset (as discussed above). The control variables included were ethnic origin, marital status, full-time/part-time employment, public or private sector employment, number of dependent children, labour market experience and a variable identifying whether individuals had any long-term illness or disability.

Second, a number of additional control variables were included to control for individual ability and social background. In particular, these included:

- Parental social class
- Parental education level
- Parental interest in child’s education
- Ability as a child (maths, reading etc aged 10)
- Use of free school meals aged 10
- Financial hardship aged 16.

Employment returns

In addition to the estimation of the wage returns associated with low level vocational attainment, we adopted a probit model to estimate the different likelihood of different qualification holders being in employment or otherwise. Separate estimations were undertaken for the years 1996, 2000 and 2004. The specification of the probit model was as follows (for men and women separately):

$$\text{probit}(EMPNOT_i) = \alpha + \gamma' Z_i + \varepsilon_i$$

where $EMPNOT_i$ is coded 1 if the individual is in full-time or part-time employment⁸ and 0 otherwise, Z_i is a vector of the independent variables included in the analysis and ε_i represents an error term.

⁸ For the 2000 and 2004 surveys, the variable was coded 1 if an individual was mostly (i.e. more than 6 months) in employment in the previous year. (This controls for any short-term shocks that may lead to an individual being out of work for a very limited period). In 1996 this information was not available, and so the variable refers to employment at the time of the survey.

As in the regressions for average earnings two separate specifications were estimated, one with a standard set of control variables, and one with the additional control variables available in the BCS dataset. As in the LFS analysis, the comparison group is limited to those with a highest academic qualification of level 2 (or below) and a highest vocational qualification of level 3 (or below).

First difference estimates

We investigated two different approaches to estimating the marginal earnings returns associated with vocational qualifications using the BCS dataset. First, we considered an approach similar to that undertaken in the LFS analysis, whereby individuals with each qualification of interest (e.g. an NVQ2, BTEC1) were compared with a comparison group comprised only of individuals whose highest qualification was at (at most) the level below. However, after investigation this approach appeared inappropriate given the small samples sizes involved in the BCS dataset.

Instead, following the approach of De Coulon and Vignoles (2007), we undertook a first-difference model relating the change in wages (between the ages of 26 and 30 and ages 30 and 34) to the qualifications achieved in the relevant period. This approach seeks to directly estimate (through controlling for other relevant variables) the impact of undertaking a particular qualification on an individual's hourly wage. As in the LFS analysis, the comparison group is limited to those with a highest academic qualification of level 2 (or below) and a highest vocational qualification of level 3 (or below).

The advantage of using this methodology is that it controls for unobserved characteristics, such as ability, that are essentially fixed over time and that may determine both the likelihood of acquiring a particular qualification and earnings. Such models are therefore more likely to identify the causal impact of acquiring a qualification on an individual's earnings. For example, individuals who are more career-oriented or motivated are more likely to acquire a qualification later in life, and are also simultaneously more likely to have higher wages. The first difference model takes account of this unobserved *motivation* characteristic by focusing on whether individuals who acquire the qualification end up with higher earnings, taking full account of the fact that they may have higher earnings in the first place due to their greater career orientation/ motivation.

2.4 Assessing rates of return

To consider the rate of return associated with a particular level or type of qualification it is necessary to estimate the total direct and indirect costs associated with acquiring the qualification as well as the discounted lifetime economic benefits. The analysis presented here considers the **individual** rate of return and **Exchequer** rate of return associated with qualification attainment. We discuss this in a number of stages below.

2.4.1 Estimating the lifetime earnings associated with qualification attainment

To assess the earnings and employment outcomes associated with different levels of qualification, the lifetime earnings associated with qualification attainment are modelled. The analysis focuses on the marginal returns to each qualification of interest – that is the returns obtained by individuals for whom the qualification of interest is their highest qualification. This involved several stages:

1. We estimated the marginal earnings premium associated with different qualification levels and types. For vocational qualifications, returns are estimated in 5 year age bands across the working age population (16-64 inclusive for men and 16-59 inclusive for women), with the returns then smoothed within individual five year age bands⁹. For Apprenticeships, a single estimate of the return is applied at all ages (due to the more limited sample size). The estimation procedure followed the methodology outlined above in Section 0, using the point estimate of the annual earnings return.

Individuals are assumed to gain the earnings premium associated with a qualification the year following completion of that qualification. As detailed in a later section (Table 4), we have assumed that level 1 qualifications are started at the age of 17 (and last ½ year); level 2 qualifications are started at the age of 18 and last 1½ years; and level 3 qualifications are started at the age of 19 and last 2½ years.

2. We estimate the change in the probability of employment associated with the attainment of each qualification (i.e. marginal employment returns) associated with different qualification levels in 5 year age bands across the working age population (16-64 inclusive for men and 16-59 inclusive for women). As above, for Apprenticeships a single estimate of the gain in the probability of employment is applied at all ages. This is detailed in Section 0.

Given the difficulty in interpreting the results of the employment equations as causal effects of qualification attainment (as discussed above), we provide a sensitivity case whereby only 50% of the estimated gain in the likelihood of employment is attributed to the qualification.

3. We estimate the annual earnings achieved by individuals in the counterfactual group. For vocational qualifications, the relevant counterfactual group is assumed to consist of those individuals in possession of academic or vocational qualifications at the next highest level of qualification. For instance, for individuals in possession of level 2 qualifications the counterfactual group consists of those holding qualifications at level 1 or below. For Advanced level apprenticeships, the

⁹ Where it was not possible to estimate earnings returns due to small sample sizes, the estimate was interpolated using the estimates for neighbouring age bands.

relevant comparison group is those with level 2 qualifications as their highest qualification. For Foundation level apprenticeships, the relevant comparison group are those with level 2 or level 1 qualifications as their highest qualification¹⁰. We also assume that apprentices would be employed even in the absence of undertaking the Apprenticeships qualification.

4. We estimate the lifetime earnings achieved by individuals holding each qualification, through inflating the earnings of the counterfactual group using the earnings premiums from (1) and the employment probabilities from (2).
5. We adjust earnings to account for the fact that earnings would be expected to increase in real terms over time (assumed to be 2% generally).
6. Based on the earnings profiles generated by qualification holders, and using information on current income tax rates and allowance and National Insurance rates, we computed the future stream of net earnings.
7. We calculated the discounted stream of additional (employment-adjusted) future earnings compared to the relevant counterfactual group. Discounting future earnings ensure that any estimates of lifetime earnings are illustrated in present value or today's money terms (using a standard discount rate of 3.5% as presented in HM Treasury Green Book).

2.4.2 Estimating the individual benefits to qualification attainment

The private benefits associated with qualification attainment are the enhanced post tax present value of lifetime earnings resulting from the qualification attained. Therefore, based on the age earnings profile generated in the previous section and current income tax and National Insurance rates and levies, we have estimated the enhanced **after-tax earnings** associated with various levels and types of vocational qualification attainment.

2.4.3 Estimating the Exchequer benefits to qualification attainment

Clearly, the Exchequer benefits from the increased tax receipts that should follow from the enhanced earnings generated by a more qualified workforce. As such, the difference in the pre-tax and post-tax earnings calculated in section 0 will provide an indication of the additional taxation receipts generated.

It is clear that qualification attainment will have a number of spill-over effects (such as improved health outcomes and reduced rates of offending and re-offending) with subsequent economic impacts for the individual and the economy more generally. Given the data sources being adopted for this analysis, we are unable to make any attempt to value these spill-over effects to either the individual or the Exchequer.

¹⁰ This approach follows that of McIntosh (2007).

Taxation rates and reliefs

We have assumed that income tax rates and allowances and National Insurance contributions are as presented in Table 1 and Table 2 below. As it is not possible to identify tax rates in the future, we utilise the most forward looking government announcements regarding both tax rates and allowances.

Table 1: Income tax rates (2010-11) and allowances (2011-12)

Income level	Income Tax on band
£0-£7,475	0%
£7,476 - £44,875	20%
£44,876 - £100,000	40%
£100,001 - £112,950	60%*
£112,950 - £150,000	40%
£150,001+	50%

Note: The effective tax rate of 60% in incomes between £100,000 and £112,950 results from the removal of the personal allowance commencing at incomes in excess of £100,000 along a 0.50 taper.

Source: London Economics assessment of HM Revenue and Customs information

Table 2: National Insurance rates (2010-11) and allowances (2010-11)

Income level	National Insurance Contributions on band
Employee contributions	
£0-£5,715	0%
£5,716 - £43,875	11%
£43,876+	1%
Employer contributions	
£0-£5,715	0%
£5,716+	12.8%

Source: London Economics assessment of HM Revenue and Customs information

Value Added Tax

We have assumed that the enhanced earnings achieved by those in possession of higher levels of qualification result in higher subsequent spending in the wider economy and enhanced indirect tax receipts accruing to the Exchequer. In particular, following previous analysis undertaken by the Department for Business, Innovation and Skills, we have assumed that the marginal propensity to consume out of enhanced income stands at 0.64 and that the average marginal rate of VAT stands at 9.7% (given the fact that food and children's clothing attract a zero rate, while general expenditure on goods and services attract a VAT rate of 17.5%)¹¹. We have also assumed that there is an equivalent reduction in VAT receipts associated with the foregone earnings during the period in which qualifications were being undertaken. As part of this element of research, we have undertaken a sensitivity analysis to consider alternative VAT rates (and found the results to be relatively insensitive to the different assumptions).

¹¹ This was calculated by dividing VAT paid to the UK government (ONS code NZGF) by household and NPISH final consumption expenditure (ONS code NSSG) in 2008. This analysis is based on information taken from the UK National Accounts - Blue Book, 2009

2.4.4 Estimating the individual direct and indirect costs associated with qualification attainment

Direct costs associated with qualification attainment

In the case of direct costs incurred by the individual, these encompass items such as tuition fees and other course related costs. We have assumed that the costs to the individual are zero.

Indirect costs associated with qualification attainment

Individuals will incur indirect costs when undertaking qualifications through foregone earnings while studying. The size of these costs depends on a number of factors, outlined in turn below.

Age of commencement and time to complete

Normally the most significant cost associated with undertaking vocational education and training relate to the opportunity costs associated with qualification attainment. Based on a previous rate of return analysis undertaken by McIntosh (2007), we have assumed that the average lengths of time to complete the various qualifications are as in Table 4 overleaf.

In particular, we have assumed that level 1 vocational qualifications require approximately ½ year to complete and that these qualifications are started by learners at the age of 17. We have assumed that level 2 vocational qualifications require 1½ years to complete and are started at the age of 18, while level 3 qualifications are started at the age of 19 and require approximately 2½ years to complete. This information is presented in Table 4.

Earnings in the counterfactual scenario

As discussed above, an important element of the analysis involved estimating the lifetime earnings associated with the “counterfactual group”. This information is also required to estimate the opportunity costs of qualification attainment, as it reflects the earnings that are foregone during their period of study. In particular, we estimate (using the LFS) that the average annual earnings achieved by individuals aged 17 with no formally recognised qualification stands at £9,713 (£10,168 for men and £8,332 for women), which increases to approximately £11,036 for individuals in possession of level 1 qualifications aged 18 (£11,367 for men and £10,383 for women) and £12,634 for individuals in possession of level 2 qualifications aged 19 (£13,204 for men and £11,991 for women).

Intensity of study

To assess the opportunity costs associated with the different levels of vocational training, we need to adjust annual earnings to reflect the fact that many of these qualifications will not be undertaken on a full time basis. Based on guidance and analysis undertaken by the Department for Business Innovation and Skills, we have assumed that the average ‘intensities’ of the various vocational qualifications under consideration are as in Table 3 overleaf. These assessments of intensity are based on the total number of guided learning hours associated with the different

levels and types of qualification and are presented in the form of full time equivalents.

In other words, the analysis undertaken by the Department suggests that undertaking level 2 vocational qualifications accounts for 28% of full time activity – or that the opportunity cost associated with undertaking a level 2 qualification is 28% of one year’s worth of full time annual earnings spread across 1½ years. Similarly, we have assumed that a level 3 qualification requires 2½ years to complete, and have assumed that the opportunity cost associated with undertaking a level 3 qualification is approximately 25% of one year’s full time annual earnings achieved by those in possession of a level 2 qualification spread across 2½ years. We assume that there are some opportunity costs in terms of foregone earnings in the case of Apprenticeships on the same basis as presented above.

For completeness, we have also considered the average number of guided learning hours and credits associated with level 1 vocational qualifications. Although there is some degree of variation, a simple estimate suggests that a representative level 2 vocational qualification consists of approximately 350 guided learning hours compared to approximately 160 for level 1 qualifications. We have therefore scaled the intensity associated with level 2 qualifications by (160/350 (0.457)) to reflect the lower intensity associated with level 1 qualifications and assumed that level 1 qualifications are completed over 6 months. These opportunity costs are then spread approximately over the period of attainment (with qualifications assumed to begin half way through the first year).

Table 3: Proportion of 1 year FTE required to complete alternative levels of vocational qualifications		
	16-18 year olds	19+ year olds
Level 1	13% of 1 year FTE over ½ year	6% of 1 year FTE over ½ year
Level 2	28% of 1 year FTE over 1½ years	12% of 1 year FTE over 1½ years
Foundation level apprenticeships	28% FTE over 1½ years	12% FTE over 1½ years
Level 3	96% of 1 year FTE over 2½ years	25% of 1 year FTE over 2½ years
Advanced level apprenticeships	96% FTE over 2½ years	25% FTE over 2½ years

Source: Department for Business Innovation and Skills analysis of the Individual Learner Record

Combining the various pieces of information relating to the age of commencement, time taken to complete the qualification, and average earnings (in the counterfactual scenario), provides an indication of the gross (i.e. pre-tax) indirect or opportunity costs associated with attaining the different types of vocational training.

Table 4: Qualification completion times and and opportunity costs (men)				
	Age of commencement	Length of course	Annual Earnings (level n-1)	Opportunity Costs (men)
Level 1	17	0.5 years	Age 17: £10,168	£1,322
Level 2	18	1.5 years	Age 18: £11,367 Age 19: £13,114	£1,137 £2,623
Level 3	19	2.5 years	Age 19: £13,204 Age 20: £14,688 Age 21: £15,540	£660 £1,469 £1,554

Note: Opportunity costs estimated on the basis that level 1 students incur costs of 13% of an FTE in year 1; level 2 students incur costs of 10% of a FTE in year 1 and 20% of a FTE in year 2. level 3 students incur costs of 5% FTE in year 1 and 10% in subsequent years.

Source: *London Economics' analysis*

Table 5: Qualification completion times and and opportunity costs (women)				
	Age of commencement	Length of course	Annual Earnings (level n-1)	Opportunity Costs (women)
Level 1	17	0.5 years	Age 17: £8,332	£1,083
Level 2	18	1.5 years	Age 18: £10,383 Age 19: £11,726	£1,038 £2,345
Level 3	19	2.5 years	Age 19: £10,663 Age 20: £11,991 Age 21: £12,962	£532 £1,199 £1,296

Note: Opportunity costs estimated on the basis that level 1 students incur costs of 13% of an FTE in year 1; level 2 students incur costs of 10% of a FTE in year 1 and 20% of a FTE in year 2. level 3 students incur costs of 5% FTE in year 1 and 10% in subsequent years.

Source: *London Economics' analysis*

The foregone earnings reflected in the tables above are used to calculate the opportunity costs associated with undertaking a qualification, through adjusting for the effects of taxation and multiplying for the probability of being in employment in the absence of holding the qualification.¹²

2.4.5 Estimating the Exchequer costs associated with qualification attainment

The Exchequer rate of return encompasses the costs associated with the provision of the qualification either through fee subsidy or student support, as well as the foregone tax revenue associated with the foregone earnings while the qualification is being attained (as discussed above).

We have assumed that the economic costs to the Exchequer associated with qualification provision relate to the direct costs of funding. From detailed work undertaken by McIntosh (2007) estimating the costs to the Exchequer associated with the provision of different types and levels of vocational qualification from

¹² Essentially this assumes that the opportunity cost of qualification attainment is zero for individuals that would be unemployed in the absence of undertaking the qualification. In reality, there be some cost to the time spent (e.g. in terms of lost leisure time). However, it is not possible to accurately value this figure. Further, given the low intensities of study for low level vocational qualifications these costs seem unlikely to be significant.

2004/05, we have assumed similar funding arrangements with an up-rating of unit costs to account for inflation. To achieve this, we have assumed an annual average inflation rate of 2.0%. We have also assumed that the direct Exchequer costs associated with the provision of vocational education and training is spread evenly over the duration of the qualifications in question.

Table 6: Unit costs per start associated with different levels and types of vocational qualifications

	Level	Average Unit Cost (2004/05)	Approximate GLH	Estimated Unit Cost (2009/10)
Apprenticeship	Level 2	£4,712 (£5,826 (16-18)-£2,067 (19+))		£5,202 (£6,432 (16-18)-£2,282 (19+))
	Level 3	£6,535 (£10,239 (16-18)-£3,249 (19+))		£7,215 (£11,304 (16-18)-£3,587 (19+))
National Vocational Qualifications	Level 1	£1,481 (£3,015 (16-18)-£864 (19+))	160	£1,635 (£3,329 (16-18)-£954 (19+))
	Level 2	£3,240 (£6,597 (16-18)-£1,891 (19+))	350	£3,577 (£7,283 (16-18)-£2,087 (19+))
	Level 3	£3,119 (£9,050 (16-18)-£2,067 (19+))		£3,444 (£9,991 (16-18)-£2,282 (19+))
Vocational Related Qualifications	Level 1	£1,770 (£1,997 (16-18)-£1,254 (19+))	160	£1,954 (£2,205 (16-18)-£1,384 (19+))
	Level 2	£3,872 (£5,223 (16-18)-£3,279 (19+))	350	£4,275 (£5,766 (16-18)-£3,620 (19+))
	Level 3	£9,633 (£11,829 (16-18)-£7,853 (19+))		£10,636 (£13,060 (16-18)-£8,670 (19+))

Source: London Economics' analysis based on information presented in McIntosh (2007)

In addition to these direct costs of provision, in the case of apprenticeships, we have assumed that there is some cost associated with the reduced productivity during the period of apprenticeship. We have assumed that the reduced productivity is equivalent to 20% of the average annual earnings associated with that level of qualification adjusted for the probability of being employed. Although strictly speaking, this cost should fall on the employer, we have assumed that the cost is absorbed by the Exchequer.

2.4.6 Estimating the rates of return associated with qualification attainment

A rate of return analysis is a standard economic or financial approach to assess the value of a particular investment (in this case human capital). The costs associated with qualification attainment generally occur in the short term, while the benefits associated with qualification attainment occur in the medium and longer term. To make an investment decision, it is necessary to compare the present value of the costs with the present value of the benefits. Adopting a standard discount rate (such as the 3.5% suggested by HM Treasury), allows us to compute the **net benefit** as a monetary amount (the present value of the benefits minus the present value of the costs).

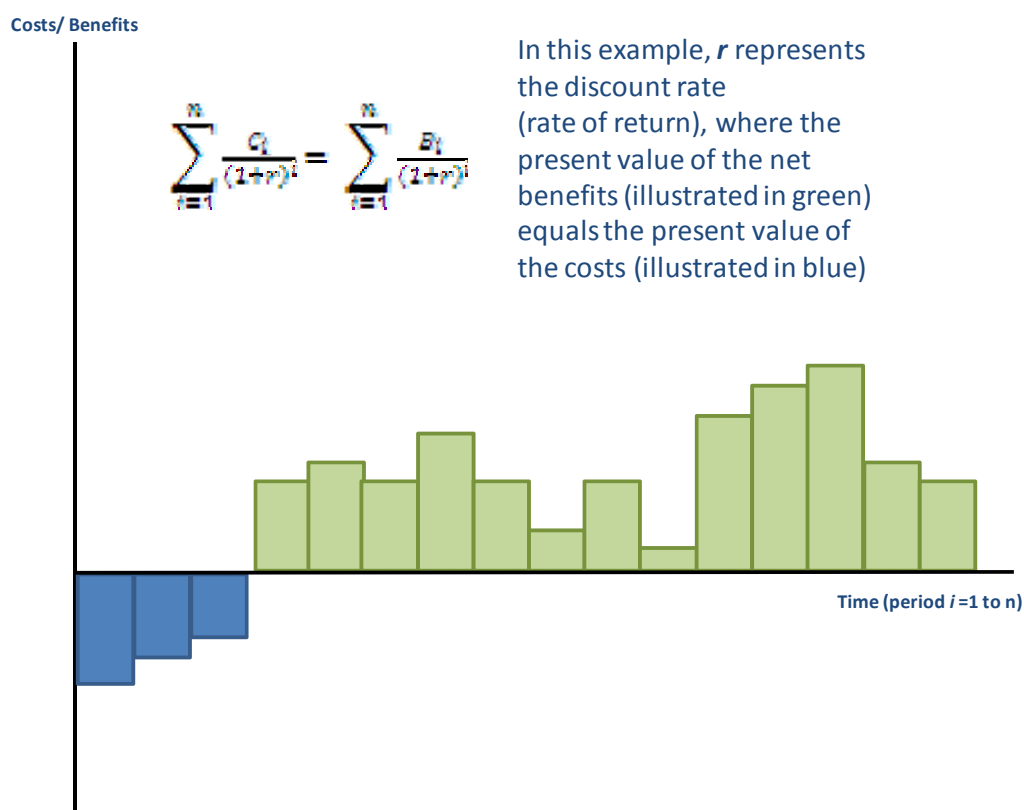
An alternative approach is to assess what the discount rate would need to be to ensure that the present value of the costs exactly equals the present value of the benefits (see Figure 1). The individual rate of return is defined as the discount rate

at which the present value of the benefits exactly equals the present value of the costs associated with qualification attainment. The Exchequer rate of return is defined as the discount rate at which the present value of the Exchequer benefits exactly equals the present value of the Exchequer costs associated with qualification provision. The rates of return that are computed provide an indication of whether the investment is worthwhile relative to the next best option (generally considered to be the cost associated with long term borrowing). If the rate of return exceeds the cost of borrowing, then the investment might be considered to be worthwhile.

Clearly, there are different costs and benefits incurred by the individual and the Exchequer both during and following the period in which the qualification is obtained. Therefore, there is no reason why the individual and Exchequer rates of return should coincide.

Figure 1 Deriving a rate of return

Source: *London Economics*



3. Marginal earnings returns to qualification attainment

3.1 Marginal earnings returns to level 3 Qualifications

In Table 7, we present the aggregate econometric findings relating to the returns to different level 3 qualifications versus a range of counterfactuals. The equivalent results for men and women are presented in Table 8. Specifically, we consider the marginal returns to RSA, City & Guilds, BTEC and NVQ level 3 qualifications versus comparison groups consisting of those with level 2 academic or vocational qualifications (as a maximum); those with level 2 vocational and/or level 1 academic qualifications (as a maximum); no qualifications; and those in possession of 5 or more GCSEs at grades A*-C. Note again that in the various tables, the actual coefficients from the regression are presented, while in the text, the precise effect is provided when the dependent variable is in log form (by transforming the coefficient (β) using the transformation $e^\beta - 1$). In general terms, for small coefficients (less than 0.1) the coefficient in the regression model will give a reasonable approximation of the percentage change, however, for coefficients greater than this, the correction is necessary. It is important to note that the analysis is dependent on the appropriateness of the counterfactual. Although we have generated a number of comparison groups, it is difficult to imagine that the possession of additional qualifications results in an earnings penalty compared to an identical individual not in possession of the qualification in question. Where negative returns are estimated, this may suggest that the counterfactual or comparison group does not accurately capture a number of unobserved characteristics or that there is some form of signalling phenomenon occurring.

As with other studies in the field, the findings illustrate that the returns to level 3 vocational qualifications are relatively significant. At the upper end of the spectrum, individuals in possession of BTEC level 3 qualifications achieve a 34.0% ($\beta=0.294$) earnings premium over those in possession of no formally recognised qualifications; a 14.2% ($\beta=0.134$) premium over those in possession of level 2 academic or vocational qualifications; an 18.9% ($\beta=0.173$) premium over those in possession of level 2 vocational and/or level 1 academic qualifications; and a 12.8% ($\beta=0.121$) premium over those in possession of 5 or more GCSEs at grades A*-C. Interestingly, the marginal returns associated with BTEC level 3 qualifications are marginally higher for men than for women.

Table 7: Marginal returns to level 3 qualifications – all				
	Males and females aggregated			
Comparison	Level 2	L2V/L1A	No Qualifications	5+ GCSEs A*-C
RSA level 3	0.093*** (0.018)	0.142*** (0.021)	0.289*** (0.049)	0.022 (0.033)
C&G level 3	0.111*** (0.004)	0.136*** (0.005)	0.220*** (0.009)	0.034*** (0.011)
BTEC level 3	0.134*** (0.005)	0.173*** (0.007)	0.294*** (0.025)	0.121*** (0.008)
NVQ level 3	0.045*** (0.004)	0.056*** (0.005)	0.141*** (0.014)	0.058*** (0.008)

Note: Aggregated marginal returns to vocational qualifications – pooled Labour Force Survey data 1996-2009. Level 2: level 2 vocational and/or level 2 academic qualifications as a maximum; L2V/L1A: level 2 vocational and/or level 1 academic qualifications as a maximum; * 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance. Standard errors in parentheses.

Source: *London Economics*

Note that it is somewhat difficult to directly compare these results with some of the other analyses in the field given the different methodologies adopted. For instance, Jenkins *et al* (2007) estimate the marginal return to BTEC level 3 qualifications to be 9.5% ($\beta=0.0909$) compared to an individual in possession of no formally recognised qualifications; however, the Jenkins *et al* (2007) analysis estimates the returns gained to the highest vocational qualification but do not control for the fact that the individual might also have high level academic qualifications at the same time.

The lowest (though still generally positive) marginal returns associated with level 3 vocational qualifications are posted by those in possession of NVQ level 3 qualifications, though again there are some differences between men and women, with men achieving higher returns to the qualification compared to women. In aggregate, the earnings premium associated with these qualifications stands at 4.6% ($\beta=0.045$) compared to those in possession of level 2 qualifications (at a maximum), 15.1% ($\beta=0.141$) compared to those with no formally recognised qualifications, and 6.0% ($\beta=0.058$) compared to those in possession of 5 or more GCSEs at grades A*-C.

Apart from the examples already mentioned, there are some other significant gender differences between the aggregated and disaggregated results presented in Table 7 and Table 8. Specifically, although the aggregate return associated with RSA level 3 qualifications is relatively modest, the returns to these qualifications for women are greater than any other type of level 3 qualification (compared to possession of no formally recognised qualifications).

Table 8: Marginal returns to level 3 qualifications – males and females separately

Comparison	Males				Females			
	Level 2	L2V/L1A	No Qual.	GCSEs	Level 2	L2V/L1A	No Qual.	GCSEs
RSA level 3	0.047 (0.055)	0.009 (0.061)	-0.030 (0.057)	0.144 (0.170)	0.116*** (0.019)	0.179*** (0.023)	0.317*** (0.052)	0.036 (0.032)
C&G level 3	0.110*** (0.004)	0.136*** (0.005)	0.217*** (0.010)	0.019 (0.012)	0.016 (0.014)	0.035** (0.017)	0.143*** (0.042)	-0.028 (0.027)
BTEC level 3	0.145*** (0.006)	0.189*** (0.009)	0.322*** (0.030)	0.111*** (0.011)	0.095*** (0.008)	0.116*** (0.012)	0.194*** (0.039)	0.109*** (0.012)
NVQ level 3	0.068*** (0.006)	0.078*** (0.008)	0.182*** (0.022)	0.087*** (0.013)	0.020*** (0.005)	0.030*** (0.007)	0.089*** (0.017)	0.028*** (0.011)

Note: Aggregated marginal returns to vocational qualifications – pooled Labour Force Survey data 1996-2009

Level 2: level 2 vocational and/or level 2 academic qualifications as a maximum; L2V/L1A: level 2 vocational and/or level 1 academic qualifications as a maximum; No Qual: No formally recognised qualifications; GCSEs: 5 or more GCSEs at grades A*-C

* 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance. Standard errors in parentheses.

Source: *London Economics*

3.2 Marginal earnings returns to level 2 Qualifications

In Table 9 and Table 10, we present the equivalent results for those in possession of level 2 vocational qualifications. At the aggregate level, the marginal returns associated with level 2 vocational qualifications are relatively strong compared to those in possession of no formally recognised qualifications, with individuals in possession of RSA level 2, City & Guilds level 2 and BTEC level 2 qualifications achieving 38.4%, 15.6% and 13.1% premiums ($\beta=0.325$, 0.145 and 0.123) over those with no qualifications. Similarly, possession of these level 2 qualifications provides a modest return over those in possession of level 1 academic and/or vocational qualifications.

Table 9: Marginal returns to level 2 qualifications – all

Comparison	Males and females aggregated		
	Level 1	No Qualifications	5+ GCSEs A*-C
RSA level 2	0.170*** (0.029)	0.325*** (0.052)	0.045 (0.034)
C&G level 2	0.088*** (0.007)	0.145*** (0.010)	-0.026** (0.013)
BTEC level 2	0.075*** (0.021)	0.123** (0.058)	0.057** (0.023)
NVQ level 2	-0.016*** (0.005)	-0.005 (0.009)	-0.062*** (0.009)
5 or more GCSEs A*-C only	0.114*** (-0.0051)	0.140*** (-0.0074)	

Note: Aggregated marginal returns to vocational qualifications – pooled Labour Force Survey data 1996-2009

Level 1: level 1 vocational and/or level 1 academic qualifications as a maximum. ** 5% level of statistical significance; *** 1% level of statistical significance. Standard errors in parentheses.

Source: *London Economics*

It is only those in possession of NVQ level 2 qualifications that struggle to achieve any earnings return, with these individuals earning 2.0% less ($\beta=-0.016$) compared to those in possession of level 1 academic and/or vocational qualifications and a statistically insignificant return compared with possession of no formally recognised qualifications. Compared to those in possession of 5 GCSEs at grades A*-C, it not

the case that those with vocational qualifications routinely underperform those with academic qualifications. In particular, although individuals in possession of City & Guilds or a NVQ at level 2 achieve between 3% and 6% lower earnings compared to their academic counterparts, individuals in possession of BTEC level 2 qualifications outperform individuals in possession of 5 good GCSEs by 5.9% ($\beta=0.057$) in terms of hourly earnings.

At the disaggregated level, again the evidence suggests that in general there are reasonable earnings premiums compared to those in possession of no formally recognised qualifications, with men posting earnings returns of more than 16.1% for City & Guilds level 2 ($\beta=0.149$), while men in possession of BTEC level 2 qualifications achieve a premium of approximately 13.1% ($\beta=0.12$) over those with no formally recognised qualifications. Men in possession of vocational qualifications earn marginally less than those men in possession of 5 or more GCSEs at grades A*-C.

Comparison	Males			Females		
	Level 1	No Qual.	5+ GCSE A*-C	Level 1	No Qual.	5+ GCSEs A*-C
RSA level 2	0.156* (0.089)	0.220* (0.113)	0.122 (0.084)	0.174*** (0.030)	0.342*** (0.056)	0.071** (0.035)
C&G level 2	0.093*** (0.007)	0.149*** (0.010)	-0.042*** (0.014)	-0.013 (0.019)	0.007 (0.031)	-0.022 (0.027)
BTEC level 2	0.077** (0.034)	0.129 (0.079)	0.049 (0.034)	0.054** (0.027)	0.099 (0.089)	0.056* (0.032)
NVQ level 2	-0.018** (0.008)	0.009 (0.013)	-0.062*** (0.014)	-0.027*** (0.007)	-0.026** (0.012)	-0.069*** (0.012)
5 or more GCSEs A*-C only	0.109*** (-0.007)	0.131*** (-0.010)		0.100*** (-0.007)	0.123*** (-0.011)	

Note: Aggregated marginal returns to vocational qualifications – pooled Labour Force Survey data 1996-2009

Level 1: level 1 vocational and/or level 1 academic qualifications as a maximum; No Qual: No formally recognised qualifications; GCSEs: 5 or more GCSEs at grades A*-C. * 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance. Standard errors in parentheses.

Source: *London Economics*

In general, men with level 2 vocational qualifications achieve higher earnings compared to those in possession of level 1 academic and/or vocational qualifications, though this in part depends on the qualification. Men in possession of level 2 City & Guilds or BTEC qualifications post small earnings premiums compared to those with level 1 qualifications; however, bearing in mind the potential of not controlling for unobserved personal and socioeconomic characteristics, both men and women in possession of NVQ level 2 qualifications earn between 2% and 3% less than the comparison group.

As with the findings relating to level 3 qualifications, the analysis illustrates that possession of RSA qualifications confer significant benefits upon female recipients. Women in possession of RSA level 2 qualifications achieve a 40.6% premium ($\beta=0.342$) over those in possession of no formally recognised qualifications and a 19.0% premium over those women in possession of level 1 academic and/or

vocational qualifications ($\beta=0.174$). These qualifications offer women the greatest earnings enhancement of any of the qualifications considered at this level.

3.2.1 Comparisons with previous research

In this section, we provide some comparison with previous studies in the field to assess the extent to which the difference in the results presented are as a result of methodological differences or as a result of changing returns over time. The analysis presented in Table 11 illustrate the returns to level 3 and level 2 vocational qualifications by Jenkins *et al* (2007) under a number of different model specifications. In 'column 1', we illustrate the returns associated with level 3 and level 2 qualifications produced by Jenkins *et al* (2007) according to their original model specification (Table 11 and Table 33 of their report respectively). In 'column 5' we reproduce the estimates from the work presented in previous sections by London Economics (Table 7 and Table 9).

Author	Jenkins (2007)	LE (2011)	LE (2011)	LE (2011)	LE (2011)
Data Range	1997-2006	1997-2006	1996-2009	2006-2009	1996-2009
Approach Adopted	Jenkins (2007)	Replication of Jenkins (2007)	Replication of Jenkins (2007)	Replication of Jenkins (2007)	LE (2011)
	Column 1	Column 2	Column 3	Column 4	Column 5
BTEC Level 3	0.175*** (0.2434)	0.188*** (0.006)	0.185*** (0.005)	0.171*** (0.012)	0.134*** (0.018)
C&G Level 3	0.172*** (0.3270)	0.145*** (0.005)	0.143*** (0.005)	0.131*** (0.011)	0.111*** (0.004)
GNVQ/GSVQ (Advanced)	0.068*** (0.0640)	0.050*** (0.011)	0.066*** (0.010)	0.136*** (0.022)	-
ONC/OND	0.252*** (0.2663)	-	-	-	-
RSA Level 3	0.164*** (0.0875)	0.154*** (0.019)	0.149*** (0.018)	0.106** (0.042)	0.093*** (0.018)
NVQ/SVQ Level 3	0.114*** (0.2183)	0.101*** (0.005)	0.097*** (0.004)	0.088*** (0.008)	0.045*** (0.004)
BTEC Level 2	0.133*** (0.0723)	0.115*** (0.018)	0.110*** (0.016)	0.094*** (0.036)	0.075*** (0.021)
C&G Level 2	0.068*** (0.0799)	0.063*** (0.009)	0.066*** (0.008)	0.074*** (0.018)	0.088*** (0.007)
GNVQ/GSVQ (intermediate)	0.013*** (0.0101)	-0.013 (0.014)	-0.011 (0.012)	0.010 (0.028)	-
RSA Level 2	0.161*** (0.0719)	0.152*** (0.022)	0.132*** (0.020)	0.040 (0.037)	0.170*** (0.021)
NVQ/SVQ Level 2	0.019*** (0.0367)	0.013** (0.005)	0.010** (0.005)	0.004 (0.009)	-0.016 (0.005)

Note: Note that in the replication of Jenkins *et al* (2007) results, ONC/OND have been included with BTEC Level 3 qualifications.

Source: London Economics

The comparison of these results suggests that there may have been a significant reduction in the earnings returns achieved by vocational qualifications over time. To assess whether this is a 'true' effect, we have attempted to replicate the analysis undertaken by Jenkins *et al* (2007) and this is presented in 'column 2'. Comparison of the results suggests that there is a good deal of consistency in the

findings once the data used and the model specification have been aligned, and that when considering the returns to vocational qualifications over the entire period for which data exists (1996-2009 in 'column 3'), there is little change in the estimates. Therefore, comparing the results in 'column 3' and 'column 5' provide an indication of the gross change in the returns (for either methodological reasons or as a result of the possible changing value of vocational qualifications in the labour market).

In 'column 4', we split the sample and consider the returns to vocational qualifications using information from 2006 to 2009 only. The comparison of these estimates of earnings returns with those presented in 'column 2' provides an indication of the extent to which the value of vocational qualifications has actually changed. The analysis suggests that there has been some downward movement in the returns, but this is substantially lower than the headline figure that might be suggested when comparing the original *Jenkins et al* (2007) results with those presented in this paper in Table 7 and Table 9. In particular, the analysis suggests that the returns to City & Guilds at level 3 have decreased by 1.6 percentage points (following exponential transformation of both relevant coefficients); RSA level 3 qualifications by 5.5 percentage points (though a relatively small sample); and NVQ Level 3 qualifications by 1.4 percentage points. At level 2, there also appears to have been a real decline in returns, with the earnings premium associated with BTEC level 2 qualifications falling by 2.3 percentage points and NVQs by 0.9 percentage points.

However, these changes in the returns are much smaller than the overall change when considering the difference in the earnings estimates between 'column 1' and 'column 3'. In fact, the analysis suggests that of the gross change in earnings returns, for the qualifications where there is greatest consistency across analyses (City & Guilds and NVQs), approximately *two-thirds* of the headline change in the returns is as a result of methodological differences between the papers, with the remaining one-third as a result of worsening labour market outcomes.

3.2.2 Reasons for the methodological discrepancies

There are a number of methodological reasons why there are differences between the results presented in this paper and those previously produced by *Jenkins et al* (2007).

The sample considered by *Jenkins et al*. (2007) in their analysis consists of all LFS respondents aged from 16 to 65 and resident in England in the period 1997 (1st quarter) to 2006 (2nd quarter). Data on wages and earnings is asked in the LFS in wave 1 and wave 5. The authors use data on wages and earnings from wave 5, for those observations with non-missing wage data. The dependent variable of their earnings model is the log of hourly real wage, derived from the gross hourly wage and deflated (after removing outliers) using the Average Earnings Index.

The two tables from *Jenkins et al* (2007) replicated in this report are Table 11 (for qualifications at level 2) and Table 33 for qualifications at level 3). Table 11 presents results controlling for the highest qualification held by an individual and

include individuals having at most a level 2 vocational qualification and a level 1 academic qualification. For each individual in possession of a level 2 vocational qualification or below the authors control for the highest vocational qualification and the highest academic qualification while they do not control for any other qualification held apart from the highest. The set of the other control variables include age (and age squared) of respondent, gender, ethnicity, region of work, a set of year dummies and a variable identifying proxy respondent (when the response is provided by a third person, such as spouse or a parent). Both full time and part time employees are included in the model and a dummy variable is used to control for part time status.

Table 33 in the Jenkins *et al* (2007) report includes the same set of control variables and controls for the highest vocational and academic qualifications for those individuals having a vocational qualification at level 3 or below and an academic qualification at level 2 or below¹³.

In contrast, London Economics use data from 1996 (1st quarter) to 2009 (4th quarter) and include all those with a valid wage observation in wave 1. The sample includes all working age individuals (women between 16 and 59 and men between 16 and 64) that are resident in the UK. The earnings model used by London Economics in this paper has the log of real wages as the dependent variable and controls for age (and age squared), ethnicity, gender, region of residence, workplace size, time spent in current employment, whether employed in the public or private sectors and yearly dummies. The model is estimated for full time employees only. The specification used by London Economics defines two hierarchies of qualifications; vocational and academic, and controls for all qualifications held. The sample for level 2 qualifications includes all those with level 2 vocational and level 1 academic qualifications at most. To avoid the potential effects of holding two vocational qualifications simultaneously, the treatment group consists of individuals having only one recognised vocational qualification at level 2.

It was unclear how to classify individuals in possession of “*Any other professional/vocational qualification/foreign qualifications*”, given that a good proportion hold qualifications comparable to a level 2 or even level 3 qualifications. We decided to exclude them from the comparison group from level 2 qualifications, but to include them in the comparison group for qualifications at level 3.

The detailed analysis presented here illustrates a number of features; firstly that the choice of sample and model specification will have a significant impact on the results generated. We have found that following the replication of previous authors’ analysis, approximately two-thirds of the headline change in the returns to vocational qualifications can be attributed to these methodological differences; and

¹³ While Jenkins *et al* (2007) control separately for the highest academic and vocational qualification, it is not entirely clear how they rank different qualifications at the same level within the national qualification framework (for example someone in possession of more than one vocational qualification at level 2). However it is plausible to assume they followed the LFS classification, as described by the variable *Hiqual* (which ranks, for example, an NVQ at level 2 above a BTEC at level 2).

secondly, despite these methodological differences, there has been a reduction in the earnings premium achieved by those in possession of vocational qualifications, although the magnitude of the reduction is in the region of 1-2 percentage points, and may simply reflect a short term dip in the outcomes achieved by those in possession of vocational qualifications given the deterioration in the wider economic environment in recent years.

3.2.3 Quantile Regressions and earnings distribution for NVQ level 2 qualifications

In Table 12, we use a quantile regression model to illustrate the distribution of the returns to NVQ level 2 qualifications around the median. A potential advantage of using quantile regression to estimate the median (or any other quartile), rather than an OLS regression to estimate the mean, is that quantile regression is more robust in the presence of large outliers. In addition, quantile regression may be a more appropriate estimating technique where we think that there may be different effects of qualification attainment at different points along the wage distribution. As explained by McIntosh and Garrett (2009), the prediction from most regression models is a point estimate of the conditional mean of a response, given a set of predictors. However, the conditional mean measures only the centre of the conditional distribution of the response. A more complete summary of the conditional distribution is provided by its quantiles. The median can serve as a measure of the centre, while the 0.25 and 0.75 quantiles mark the value of the response below which reside 25% and 75% of the response variable.

The findings indicate that compared to an individual in possession of no formally recognised qualifications, the marginal return to a National Vocational Qualification at level 2 for an individual at the median is statistically insignificantly different from zero ($\beta=0.011$) compared to possession of no formally recognised qualifications. However, there is some variation across the distribution, with the marginal return to a NVQ level 2 on the 25th percentile standing at 2.4% ($\beta=0.024$) compared to the marginal return on the 75th percentile standing at -2.2% ($\beta=-0.022$) compared to possession of no formally recognised qualifications.

Table 12: Marginal returns to NVQ level 2 qualifications using quantile regression– all, males and females

Percentile	level 1			No Qualifications		
	All	Males	Females	All	Males	Females
P25 (First quartile)	0.006 (0.006)	0.015 (0.009)	0.032*** (0.005)	0.024** (0.010)	0.049*** (0.018)	0.006 (0.011)
P 50 (Median)	-0.011 (0.007)	0.004 (0.010)	0.018*** (0.006)	0.011 (0.012)	0.026 (0.017)	-0.015 (0.014)
P75 (Third quartile)	-0.033*** (0.007)	-0.026** (0.010)	-0.004 (0.008)	-0.022* (0.013)	-0.017 (0.020)	-0.046*** (0.016)

Note: Aggregated marginal returns to vocational qualifications – pooled Labour Force Survey data 1996-2009

level 1: level 1 vocational and/or level 1 academic qualifications as a maximum; No Qual: No formally recognised qualifications; GCSEs: 5 or more GCSEs at grades A*-C. * 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance. Standard errors in parentheses.

Source: London Economics

This implies that the return to National Vocational Qualifications at level 2 is greater for those at the lower end of the earnings spectrum compared to those in the middle or higher end of the earnings spectrum. From this analysis, it seems that the statistically insignificant premium observed in the aggregate is driven down by those at the upper end of the income distribution (though it is important to remember that this is a relatively low income group compared to the population as a whole) and driven upwards by those at the bottom end of the income distribution.

The results presented above are also driven by different gender effects. In particular, relative to possession of no formally recognised qualifications, at the median point, men post an earnings premium of 2.6% ($\beta=0.026$) compared to statistically insignificant return for women. In contrast, women on the 75th percentile demonstrate relatively poor returns, earning approximately 4.6% less than the comparison group ($\beta=-0.046$) compared to a statistically insignificant return for men on the 75th percentile. The highest returns are achieved by men on the 25th percentile, who post a 5.0% marginal earnings return ($\beta=0.049$) relative to possession of no formally recognised qualifications.

Below we also present information on the earnings distribution for individuals in possession of NVQ2 as their highest (and sole) qualification and individuals in possession of no qualifications. Looking at the earnings distribution confirms the evidence presented in Table 12, even when significant factors (such as age) are not controlled for. Specifically, Table 13 illustrates that the difference in earnings between respondents who went on to acquire an NVQ level 2 as their highest qualification¹⁴ and those with no formally recognised qualifications is relatively limited (especially for women) in the bottom half of the distribution; however, the earnings of those with no formally recognised qualifications start to significantly exceed the earnings of those with NVQ level 2 qualifications in the top half of the distribution.

This reiterates the evidence presented in Table 12 that the return to National Vocational Qualifications at level 2 is greater for those at the lower end of the earnings spectrum compared to those in the middle or higher end of the earnings spectrum.

¹⁴ Individuals in possession of a NVQ level 2 qualification and who have no other formally recognised qualification

Table 13: Earnings distribution for respondents holding either NVQ level 2 as highest qualification or no qualification – all, males and females separately

Statistic	All		Males		Females	
	NVQ2	No Qualifications	NVQ2	No Qualifications	NVQ2	No Qualifications
P 10	4.78	4.84	5.25	5.10	4.52	4.57
P 25	5.75	5.87	6.13	6.27	5.52	5.41
P 50	7.08	7.41	7.75	7.96	6.60	6.57
P 75	8.86	9.59	9.96	10.29	8.09	8.31
P 90	10.72	12.58	12.03	13.41	9.63	10.74
Mean	7.59	8.30	8.29	8.87	6.97	7.31

Note: Pooled Labour Force Survey data 1996-2009. Earnings presented relate to gross hourly earnings

P: Percentile, NVQ2: NVQ2 as highest qualification, with no other recorded qualification.

Source: *London Economics*

3.3 Marginal earnings returns to level 1 Qualifications

In Table 14 below, we present the returns associated with level 1 vocational qualifications – both in aggregate and broken down by gender. The results generally follow those relating to level 3 and level 2 qualifications detailed previously, with all qualifications generally offering a positive return over possession of no formally recognised qualifications (between 9.1% and 17.9% ($\beta=0.087$ and 0.165 respectively) in aggregate (with the exception of NVQ level 1 qualifications). Women in possession of RSA qualifications perform particularly well and post 20% returns ($\beta=0.182$), while City & Guilds and BTEC qualifications provide the best earnings returns at this level to men (up to 20% ($\beta=0.185$)).

Table 14: Marginal returns to level 1 qualifications – all, males and females separately

Comparison	All	Males	Females
	No Qualifications	No Qualifications	No Qualifications
RSA level 1	0.165*** (0.0088)	0.082** (0.0320)	0.182*** (0.0090)
C&G level 1	0.087*** (0.0108)	0.010*** (0.0122)	-0.003 (0.0216)
BTEC level 1	0.156*** (0.0395)	0.185*** (0.0417)	0.093 (0.0768)
NVQ level 1	-0.020 (0.0124)	-0.010 (0.0172)	-0.043** (0.0177)

Note: Aggregated marginal returns to vocational qualifications – pooled Labour Force Survey data 1996-2009

No Qual: No formally recognised qualifications, GCSEs: 5 or more GCSEs at grades A*-C. * 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance. Standard errors in parentheses.

Source: *London Economics*

3.4 Marginal earnings returns by sector

3.4.1 Level 3 qualifications

In this section of the report, we present some information on the variation of returns depending on the sector of the economy the individual is employed in¹⁵. In Table

¹⁵ It should be noted that in the analysis by sector some coefficients (whether statistically significant or not) are based on very small cell sizes (for the treatment group) and cannot be taken as robust estimates (see Table 97).

15, we provide information on aggregate marginal returns for all individuals with level 3 vocational qualifications (compared to individuals in possession of level 2 academic or vocational qualifications at a maximum) broken down by industrial sector, while in Table 16 and Table 17, the equivalent information is presented for men and women separately.

The findings in Table 15 suggest that there is significant variation in the earnings returns achieved by individuals depending on the nature of the vocational qualification and the sector of employment.

For those in possession of City & Guilds qualifications at level 3, the analysis suggests that the highest marginal returns (compared to level 2 qualifications) exist in the manufacturing sector and in the energy and water sector (almost 15%), though there are marginal returns in excess of 10% in the construction sector, distribution sector and transport and communication sector. The returns are higher for men than for women across the majority of sectors.

For those individuals in possession of BTEC qualifications at level 3, a similar picture is demonstrated. The highest marginal returns (compared to level 2 qualifications) exist in the agriculture and fishing sector, while there are earnings returns in excess of 16% in the energy and water sector, manufacturing sector, construction sector and transport and communication sector, and returns in excess of 11% occur in the distribution, hotels and restaurants sectors of the economy. The returns are higher for men than for women across the majority of sectors. As with City & Guilds qualifications, the relative earnings enhancement associated with BTEC qualifications is greater for men than for women irrespective of sector (with the exception of the 'other' sectors).

Where statistically significant, the marginal returns associated with NVQ level 3 qualifications compared to those in possession of level 2 qualifications range from 2.2% in the case of public administration, education and health sector ($\beta=0.022$) to almost 16% in the case of the construction sector ($\beta=0.146$). There are some gender differences. Relatively speaking, women appear to achieve relatively strong benefits from NVQ level 3 qualifications in the manufacturing sector and the distribution, hotels and restaurants sector. As with the results more generally, women with RSA level 3 qualifications achieve significant earnings premiums across most sectors of the economy; possession of level 3 RSA qualification provides an earnings enhancement of approximately 13.1% to women in the manufacturing sector ($\beta=0.123$) and 32.3% to women working in the transport and communication sectors ($\beta=0.28$).

Table 15: Marginal returns to level 3 qualifications by sector – all

Sector	Agriculture and Fishing	Energy and Water	Manufacturing	Construction	Distribution hotels and restaurants	Transport and Communication	Banking, finance and insurance	Public Admin, education and health	Other	Average
RSA L3	-	0.090 (0.088)	0.094** (0.043)	-0.056 (0.078)	0.002 (0.073)	0.188*** (0.073)	0.056* (0.034)	0.068*** (0.025)	0.068 (0.109)	0.093*** (0.018)
C&G L3	-0.021 (0.053)	0.132*** (0.025)	0.137*** (0.007)	0.112*** (0.010)	0.102*** (0.010)	0.113*** (0.014)	0.023 (0.019)	0.052*** (0.010)	0.081*** (0.025)	0.111*** (0.004)
BTEC L3	0.230*** (0.054)	0.192*** (0.033)	0.164*** (0.010)	0.162*** (0.021)	0.113*** (0.014)	0.156*** (0.019)	0.096*** (0.013)	0.081*** (0.009)	0.066** (0.026)	0.134*** (0.005)
NVQ L3	-0.025 (0.050)	0.043 (0.027)	0.053*** (0.010)	0.146*** (0.015)	0.072*** (0.010)	0.046*** (0.015)	0.007 (0.013)	0.022*** (0.006)	0.100*** (0.021)	0.045*** (0.004)

Note: Aggregated marginal returns to vocational qualifications – pooled Labour Force Survey data 1996-2009

Comparison group consists of level 2 qualifications, i.e. level 2 vocational and/or level 2 academic qualifications as a maximum

* 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance. Standard errors in parentheses. Grey shaded cells indicate that the difference with the average coefficient is significant at 5% level.

Source: London Economics

Table 16: Marginal returns to level 3 qualifications by sector – males

Sector	Agriculture and Fishing	Energy and Water	Manufacturing	Construction	Distribution hotels and restaurants	Transport and Communication	Banking, finance and insurance	Public Admin, education and health	Other	Average
RSA L3	.	0.242*** (0.068)	0.135 (0.094)	0.016 (0.191)	-0.058 (0.088)	0.003 (0.073)	0.194 (0.162)	0.065 (0.106)	-0.443*** (0.044)	0.047 (0.055)
C&G L3	-0.024 (0.053)	0.145*** (0.025)	0.133*** (0.007)	0.111*** (0.010)	0.088*** (0.011)	0.117*** (0.015)	0.017 (0.020)	0.049*** (0.012)	0.103*** (0.029)	0.110*** (0.004)
BTEC L3	0.255*** (0.058)	0.223*** (0.039)	0.167*** (0.010)	0.176*** (0.023)	0.109*** (0.018)	0.172*** (0.021)	0.097*** (0.020)	0.088*** (0.013)	-0.008 (0.038)	0.145*** (0.006)
NVQ L3	-0.034 (0.056)	0.065* (0.033)	0.049*** (0.012)	0.162*** (0.016)	0.086*** (0.014)	0.064*** (0.021)	0.029 (0.025)	0.024* (0.013)	0.051 (0.040)	0.068*** (0.006)

Note: Aggregated marginal returns to vocational qualifications – pooled Labour Force Survey data 1996-2009

Comparison group consists of level 2 qualifications, i.e. level 2 vocational and/or level 2 academic qualifications as a maximum

* 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance. Standard errors in parentheses. Grey shaded cells indicate that the difference with the average coefficient is significant at 5% level.

Source: London Economics

Table 17: Marginal returns to level 3 qualifications by sector – females

Sector	Agriculture and Fishing	Energy and Water	Manufacturing	Construction	Distribution hotels and restaurants	Transport and Communication	Banking, finance and insurance	Public Admin, education and health	Other	Average
RSA L3	.	0.034 (0.078)	0.123** (0.049)	-0.006 (0.099)	0.044 (0.085)	0.280*** (0.095)	0.060* (0.032)	0.077*** (0.025)	0.069 (0.110)	0.116*** (0.019)
C&G L3	0.362*** (0.116)	-0.124 (0.086)	0.090** (0.036)	-0.065 (0.091)	0.068** (0.028)	0.030 (0.075)	0.000 (0.048)	0.033 (0.023)	0.015 (0.047)	0.016 (0.014)
BTEC L3	0.143 (0.153)	0.066 (0.043)	0.133*** (0.023)	0.072 (0.048)	0.095*** (0.021)	0.098** (0.039)	0.080*** (0.017)	0.072*** (0.011)	0.135*** (0.036)	0.095*** (0.008)
NVQ L3	0.047 (0.100)	0.032 (0.049)	0.048*** (0.015)	0.001 (0.044)	0.056*** (0.014)	0.023 (0.021)	-0.012 (0.014)	0.021*** (0.007)	0.130*** (0.024)	0.020*** (0.005)

Note: Aggregated marginal returns to vocational qualifications – pooled Labour Force Survey data 1996-2009

Comparison group consists of level 2 qualifications, i.e. level 2 vocational and/or level 2 academic qualifications as a maximum

* 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance. Standard errors in parentheses. Grey shaded cells indicate that the difference with the average coefficient is significant at 5% level.

Source: London Economics

3.4.2 Level 2 qualifications

In Table 18, we provide information at an aggregate level on the returns to level 2 vocational qualifications compared to those in possession of level 1 academic or vocational qualifications at a maximum. Compared to the findings in relation to level 3 qualifications, there is slightly more variation in the marginal returns when considering level 2 qualifications. In particular, for individuals in possession of City & Guilds level 2 qualifications, earnings returns range from 14.6% in the water and energy sectors ($\beta=0.136$) to a 3.2% premium (statistically insignificant) achieved by those in employment in the banking, finance and insurance sector ($\beta=-0.032$). In some respects, this may be unsurprising given the focus of City & Guilds qualifications traditionally, and it is important to note that earnings returns or between 5% and 10% are more common than not.

In general, the aggregate results indicate that the returns associated with BTEC level 2 qualifications are insignificantly different from zero, with the exception of the distribution, hotels and restaurants sector where a 8.0% premium is achieved ($\beta=0.077$). In the case of National Vocational Qualifications, there is again some significant variation in returns, with individuals in the construction industry achieving a 2.6% premium ($\beta=0.026$) over those in possession of level 1 qualifications, while individuals in the banking, finance and insurance sectors of the economy earn 4.4% less ($\beta=-0.045$), and more surprisingly, 2.0% less ($\beta=-0.020$) compared to those in the public administration, education and health sectors.

Table 18: Marginal returns to level 2 qualifications by sector – all

Sector	Agriculture and Fishing	Energy and Water	Manufacturing	Construction	Distribution hotels and restaurants	Transport and Communication	Banking, finance and insurance	Public Admin, education and health	Other	Average
RSA L2	.	0.462*** (0.082)	0.261*** (0.070)	0.047 (0.229)	0.120 (0.090)	0.086 (0.106)	0.029 (0.055)	0.158*** (0.041)	0.128 (0.123)	0.170*** (0.029)
C&G L2	0.036 (0.063)	0.136*** (0.040)	0.101*** (0.010)	0.092*** (0.019)	0.075*** (0.016)	0.077*** (0.020)	0.032 (0.033)	0.041** (0.018)	0.008 (0.041)	0.088*** (0.007)
BTEC L2	0.074 (0.084)	0.116 (0.215)	0.030 (0.035)	0.294** (0.134)	0.076** (0.034)	0.060 (0.066)	0.031 (0.063)	0.056 (0.052)	0.111 (0.076)	0.075*** (0.021)
NVQ L2	-0.082 (0.058)	0.005 (0.048)	-0.008 (0.011)	0.026 (0.021)	-0.004 (0.011)	-0.005 (0.022)	-0.045** (0.018)	-0.020** (0.009)	0.044* (0.025)	-0.016*** (0.005)

Note: Aggregated marginal returns to vocational qualifications – pooled Labour Force Survey data 1996-2009

Comparison group consists of level 1 qualifications, i.e. level 1 vocational and/or level 2 academic qualifications as a maximum

* 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance. Standard errors in parentheses. Grey shaded cells indicate that the difference with the average coefficient is significant at 5% level.

Source: *London Economics*

In Table 19 and Table 20, we present the equivalent information for men and women separately. The results do not vary significantly from those presented in Table 18, though it is interesting to note that men in possession of RSA qualifications achieve relatively healthy returns to these qualifications across a number of sectors, including a 29.3% premium in the construction sector ($\beta=0.257$), a 50.2% premium in the energy and water sector ($\beta=0.407$) and a 35.3% return in the public administration, education and health sectors ($\beta=0.302$). However, it is important to note that these results, although significant, may be misleading given the relatively low incidence of male take up of these qualifications.

Table 19: Marginal returns to level 2 qualifications by sector – Males

Sector	Agriculture and Fishing	Energy and Water	Manufacturing	Construction	Distribution hotels and restaurants	Transport and Communication	Banking, finance and insurance	Public Admin, education and health	Other	Average
RSA L2	.	0.407*** (0.091)	0.307** (0.133)	0.257*** (0.046)	0.030 (0.111)	-0.159 (0.304)	-0.543*** (0.098)	0.302*** (0.038)	-0.046 (0.059)	0.156* (0.089)
C&G L2	0.057 (0.067)	0.141*** (0.041)	0.097*** (0.011)	0.095*** (0.019)	0.061*** (0.018)	0.086*** (0.020)	0.042 (0.040)	0.079*** (0.022)	-0.026 (0.055)	0.093*** (0.007)
BTEC L2	0.208*** (0.073)	.	0.064 (0.050)	0.357** (0.176)	0.094** (0.046)	0.091 (0.080)	-0.006 (0.178)	-0.010 (0.080)	0.134 (0.160)	0.077** (0.034)
NVQ L2	-0.085 (0.064)	0.011 (0.062)	-0.004 (0.013)	0.022 (0.023)	-0.000 (0.017)	-0.021 (0.027)	-0.041 (0.032)	-0.067*** (0.021)	-0.034 (0.036)	-0.018** (0.008)

Note: Aggregated marginal returns to vocational qualifications – pooled Labour Force Survey data 1996-2009

Comparison group consists of level 1 qualifications, i.e. level 1 vocational and/or level 2 academic qualifications as a maximum

* 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance. Standard errors in parentheses. Grey shaded cells indicate that the difference with the average coefficient is significant at 5% level.

Source: *London Economics*

In general, men post better returns compared to women, with men in possession of City & Guilds qualifications at level 2 posting earnings premiums of 15.1% in the energy and water sector ($\beta=0.141$), 10.0% in the manufacturing sector ($\beta=0.095$), and almost 10.0% in construction and transport and communication sectors ($\beta=0.095$ and 0.086). Men in possession of level 2 BTEC qualifications also post large returns in some cases compared to those in possession of level 1 academic or vocational qualifications, with men in the agriculture and fishing and construction sectors achieving returns of between 23.1% and 42.9% ($\beta=0.208$ and 0.357).

Table 20: Marginal returns to level 2 qualifications by sector – females

Sector	Agriculture and Fishing	Energy and Water	Manufacturing	Construction	Distribution hotels and restaurants	Transport and Communication	Banking, finance and insurance	Public Admin, education and health	Other	Average
RSA L2	.	0.439** (0.172)	0.232*** (0.081)	-0.093 (0.366)	0.131 (0.108)	0.161 (0.100)	0.061 (0.053)	0.168*** (0.043)	0.122 (0.127)	0.174*** (0.030)
C&G L2	-0.041 (0.218)	0.457 (0.350)	0.025 (0.051)	-0.158* (0.085)	0.081** (0.036)	-0.079 (0.106)	-0.050 (0.055)	-0.066** (0.030)	0.100* (0.052)	-0.013 (0.019)
BTEC L2	0.155 (0.198)	-0.098 (0.205)	-0.048 (0.046)	0.032 (0.115)	0.034 (0.051)	-0.052 (0.124)	0.029 (0.048)	0.076 (0.065)	0.078 (0.085)	0.054** (0.027)
NVQ L2	0.055 (0.129)	0.068 (0.092)	-0.023 (0.022)	0.007 (0.047)	-0.017 (0.014)	0.010 (0.041)	-0.066*** (0.023)	-0.009 (0.010)	0.113*** (0.032)	-0.027*** (0.007)

Note: Aggregated marginal returns to vocational qualifications – pooled Labour Force Survey data 1996-2009

Comparison group consists of level 1 qualifications, i.e. level 1 vocational and/or level 2 academic qualifications as a maximum

* 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance. Standard errors in parentheses. Grey shaded cells indicate that the difference with the average coefficient is significant at 5% level.

Source: *London Economics*

Previous studies that analysed the earnings returns associated with NVQ level 2 qualifications by sector found positive returns for males in energy and water, construction and 'other' services (Jenkins et al., 2007) and in energy and water only (Dearden et al., 2004), while we found small positive returns (but insignificant) in energy and water and construction, and returns close to zero in the manufacturing and distribution sectors (not dissimilar to Jenkins et al. (2007)). For women Jenkins et al. (2007) also observed positive returns in agriculture and fishing, energy and water, Manufacturing, Distribution, Transport and Communication, Public administration, education and health and 'other' services, while Dearden et al. (2004) found positive returns for women only in the distribution, public administration, education and health and 'other' services sectors. Our results highlighted positive (but insignificant) returns for women holding an NVQ at level 2 as highest qualification in the agriculture and fishing, energy and water, transport and communications and 'other' services sectors.

3.4.3 Level 1 qualifications

Finally in this section, we present the marginal returns to the various level 1 qualifications compared to those in possession of no formally recognised qualifications. The aggregate results relating to all individuals are presented in Table 21, which again indicate that there are in some cases considerable returns associated with the acquisition of these low level qualifications in some sectors of the economy, and also the fact that there is some variation between the sectors.

Sector	Agriculture and Fishing	Energy and Water	Manufacturing	Construction	Distribution hotels and restaurants	Transport and Communication	Banking, finance and insurance	Public Admin, education and health	Other	Average
RSA L1	0.227** (0.096)	0.116 (0.075)	0.171*** (0.019)	-0.027 (0.054)	0.126*** (0.020)	0.039 (0.038)	0.138*** (0.026)	0.166*** (0.014)	0.167*** (0.053)	0.165*** (0.0088)
C&G L1	-0.056 (0.060)	0.209*** (0.080)	0.116*** (0.019)	0.124*** (0.031)	0.048** (0.023)	0.081*** (0.031)	-0.028 (0.042)	0.120*** (0.024)	-0.041 (0.058)	0.087*** (0.0108)
BTEC L1	.	-0.141 (0.168)	0.147** (0.065)	0.181** (0.080)	0.065 (0.103)	0.131** (0.055)	0.229 (0.193)	0.175** (0.086)	0.178 (0.184)	0.156*** (0.0395)
NVQ L1	0.019 (0.128)	0.064 (0.095)	-0.018 (0.020)	0.105** (0.043)	-0.035 (0.026)	0.003 (0.055)	-0.101** (0.040)	-0.038 (0.025)	0.002 (0.071)	-0.020 (0.0124)

Note: Aggregated marginal returns to vocational qualifications – pooled Labour Force Survey data 1996-2009

Comparison group consists of those in possession of no formally recognised qualifications

* 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance. Standard errors in parentheses. Grey shaded cells indicate that the difference with the average coefficient is significant at 5% level.

Source: *London Economics*

The analysis suggests that individuals in possession of City & Guilds qualifications achieve returns of up to 23.2% compared to possession of no qualifications in the energy and water sector ($\beta=0.209$) and that returns of approximately 13% are posted in the manufacturing and construction industries ($\beta=0.116$ and 0.124 respectively). The construction sector also provides individuals with low level BTEC qualifications with a 19.8% premium ($\beta=0.181$), while BTEC level 1 holders post returns of approximately 15.8% in the manufacturing sector ($\beta=0.147$) and approximately 19% in the public administration, education and health sectors ($\beta=0.175$). Following the general trend associated with possession of vocational qualifications at level 2 and level 3, men appear to achieve higher returns from the possession of vocational qualifications than women and this information is presented in Table 22 and Table 23.

The only occasion where a vocational qualification at level 1 is associated with a statistically significant negative return relates to possession of a NVQ level 1 in the banking, finance and insurance sectors. Men in possession of these qualifications earn 13.4% less ($\beta=-0.142$) when compared to those in possession of no qualifications, while the equivalent estimate for women stands at -8% ($\beta=-0.083$ although statistically insignificant). It is important to note that there are a number of incidences of individuals with NVQ level 1 qualifications achieving positive returns,

with men in the construction industry posting an 11.0% premium ($\beta=0.104$) over those with no formally recognised qualifications; however, the model did not illustrate any circumstances where women with NVQ level 1 qualification posted a statistically significant return compared to possession of no formally recognised qualifications (either positive or negative).

Table 22: Marginal returns to level 1 qualifications by sector – males

Sector	Agriculture and Fishing	Energy and Water	Manufacturing	Construction	Distribution hotels and restaurants	Transport and Communication	Banking, finance and insurance	Public Admin, education and health	Other	Average
RSA L1	0.325 (0.316)	0.104 (0.130)	0.058 (0.049)	0.075 (0.161)	0.055 (0.058)	0.072 (0.070)	0.181 (0.137)	0.065 (0.080)	0.203 (0.140)	0.082** (0.0320)
C&G L1	-0.073 (0.059)	0.195** (0.079)	0.132*** (0.021)	0.128*** (0.031)	0.060** (0.027)	0.085*** (0.032)	-0.051 (0.050)	0.147*** (0.032)	-0.013 (0.062)	0.010*** (0.0122)
BTEC L1	.	-0.121 (0.175)	0.145** (0.069)	0.181** (0.081)	0.106 (0.094)	0.140** (0.064)	0.979*** (0.065)	0.238** (0.099)	-0.064 (0.278)	0.185*** (0.0417)
NVQ L1	0.008 (0.128)	0.073 (0.107)	-0.034 (0.026)	0.104** (0.044)	-0.020 (0.042)	0.005 (0.059)	-0.142** (0.057)	-0.044 (0.045)	0.061 (0.082)	-0.010 (0.0172)

Note: Aggregated marginal returns to vocational qualifications – pooled Labour Force Survey data 1996-2009. Comparison group consists of those in possession of no formally recognised qualifications. * 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance. Standard errors in parentheses. Grey shaded cells indicate that the difference with the average coefficient is significant at 5% level.

Source: London Economics

Table 23: Marginal returns to level 1 qualifications by sector – females

Sector	Agriculture and Fishing	Energy and Water	Manufacturing	Construction	Distribution hotels and restaurants	Transport and Communication	Banking, finance and insurance	Public Admin, education and health	Other	Average
RSA L1	0.178 (0.112)	0.093 (0.175)	0.212*** (0.020)	-0.085 (0.079)	0.141*** (0.021)	0.032 (0.045)	0.138*** (0.025)	0.172*** (0.014)	0.155*** (0.055)	0.182*** (0.0090)
C&G L1	0.293 (0.315)	.	-0.055* (0.031)	-0.017 (0.148)	-0.021 (0.038)	-0.038 (0.069)	0.067 (0.067)	0.083** (0.036)	-0.080 (0.152)	-0.003 (0.0216)
BTEC L1	.	.	0.176 (0.172)	.	-0.037 (0.171)	0.257** (0.118)	0.073 (0.172)	0.120 (0.115)	0.515** (0.218)	0.093 (0.0768)
NVQ L1	.	0.281 (0.272)	0.017 (0.031)	-0.391 (0.263)	-0.054* (0.032)	0.032 (0.148)	-0.083 (0.061)	-0.042 (0.029)	-0.094 (0.115)	-0.043** (0.0177)

Note: Aggregated marginal returns to vocational qualifications – pooled Labour Force Survey data 1996-2009. Comparison group consists of those in possession of no formally recognised qualifications. * 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance. Standard errors in parentheses. Grey shaded cells indicate that the difference with the average coefficient is significant at 5% level.

Source: London Economics

3.5 Marginal returns by occupation

In Table 24 (overleaf), we have also undertaken an analysis of the returns to NVQ level 2 qualifications by occupation. The analysis presents the earnings return associated with a National Vocational Qualification level 2 qualifications for given occupations compared to individuals who are in those same occupations without the NVQ level 2.

The analysis indicates that the earnings premium associated with NVQ level 2 qualifications varies significantly by occupation, and, while there is also variation by gender, we can identify a common pattern for males and females in the distribution of returns. In fact, earnings returns for NVQ level 2 qualifications have a negative sign for both men and women in a number of 'higher grade' occupations including: managers and senior officials, professional occupations, associate professional and technical occupations, and administrative and secretarial occupations. For men the size of the negative returns, compared to level 1 qualifications or below, varies from 10.7% in the associate professional and technical occupations ($\beta=-0.113$) to around 3% in the administrative and secretarial occupations ($\beta=-0.031$). For women the negative returns, range from around 9% in professional occupations, associate professional and technical occupations ($\beta=-0.088$) to a 2.6% in administrative and secretarial occupations ($\beta=-0.026$). This reinforces the earlier analysis using quantile regression that demonstrates that the negative wage premium observed in the aggregate is driven by individuals at the top end of the income distribution.

On the other hand, in some occupations, individuals in possession of an NVQ level 2 experience positive earnings returns. In fact, men earn a positive return from the qualification (relative to level 1 qualifications) in the skilled trades occupations (4.5% ($\beta=0.044$)), as process, plant and machine operatives (3.8% ($\beta=0.037$)) and in elementary occupations (although not statistically significant in the last case).

Comparison	level 1			No Qualifications		
	All	Males	Females	All	Males	Females
Managers and Senior Officials	-0.064** (0.027)	-0.088** (0.039)	-0.058* (0.035)	-0.089 (0.064)	-0.095 (0.098)	-0.081 (0.075)
Professional occupations	-0.066 (0.052)	-0.055 (0.072)	-0.096 (0.116)	-0.172 (0.129)	-0.132 (0.243)	0.137 (0.253)
Associate Professional and Technical	-0.097*** (0.024)	-0.113*** (0.038)	-0.088*** (0.029)	-0.086* (0.046)	-0.075 (0.052)	-0.067 (0.083)
Administrative and Secretarial	-0.023** (0.011)	-0.031 (0.023)	-0.026** (0.013)	-0.014 (0.028)	0.010 (0.054)	-0.022 (0.031)
Skilled Trades Occupations	0.038*** (0.014)	0.044*** (0.015)	-0.000 (0.035)	0.045* (0.024)	0.054* (0.028)	0.049 (0.049)
Personal Service Occupations	0.041*** (0.012)	-0.017 (0.027)	0.057*** (0.013)	0.029* (0.017)	0.034 (0.038)	0.026 (0.019)
Sales and Customer Service Occupations	-0.012 (0.018)	-0.051 (0.032)	0.002 (0.020)	0.006 (0.036)	-0.001 (0.059)	0.011 (0.047)
Process, Plant and Machine Operatives	0.025* (0.013)	0.037** (0.016)	-0.018 (0.025)	0.007 (0.020)	0.017 (0.023)	-0.011 (0.040)
Elementary Occupations	0.016 (0.013)	0.016 (0.016)	0.002 (0.025)	0.020 (0.020)	0.029 (0.025)	-0.002 (0.034)

Note: Aggregated marginal returns to vocational qualifications – pooled Labour Force Survey data 1996-2009

Level 1: level 1 vocational and/or level 1 academic qualifications as a maximum. No Qual: No formally recognised qualifications

* 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance.

Source: *London Economics*

There is a negative association for men between earnings and NVQ at level 2 in personal service occupations and sales and customer service occupations; however, women holding an NVQ level 2 in these occupations experience a positive earnings return. These results are in line with previous findings in literature, especially with those presented by Jenkins et al. (2007), with some differences relating to the estimates for females, although this is likely to be explained by the presence of full-time workers only in our sample.

3.6 Marginal earnings returns by age

3.6.1 Level 3 qualifications

In this section we present some information on the variation in the returns to vocational qualifications depending on the age of the individuals in possession of those qualifications. This is different from the returns to qualifications by age of qualification acquisition, which is presented in section 0, alongside some descriptive statistics on the average age of qualification acquisition at level 2 (Table 44). There is no precise or universal relationship between the age and the earnings associated with different levels or types of qualification attainment; however there are some general results that may be inferred from the data. In particular, in Table 25, the returns to level 3 vocational qualifications are presented compared to those

in possession of level 2 qualifications of any description as a maximum. The results indicate for those in possession of BTEC level 3 qualifications, the earnings premium appears to increase with age – though this is not a strictly monotonic relationship. The analysis indicates that the returns to BTEC level 3 qualifications are slightly increasing with age, with individuals aged between 21 and 30 posting earnings premiums of approximately 3.2 to 9.0% compared to level 2 qualifications ($\beta=0.031$ and 0.09). This compares to a return of between 16.3% and 12.3% for those aged between 51 and 60 ($\beta=0.151$ and 0.116).

A similar outcome is achieved for those in possession of City & Guilds qualifications. For individuals with City & Guilds qualifications at level 3, the return achieved by those aged between 51 and 60 stands at almost 15% compared to 51-60 year olds in possession of level 2 qualifications as their highest qualification ($\beta=0.136$ and 0.138). This compares to returns of between 8.2% and 10.2% for those aged between 26 and 45 ($\beta=0.079$ and 0.0967).

Table 25: Marginal returns to level 3 qualifications by age – all

Age Band	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-64
RSA level 3	-0.047 (0.125)	0.139* (0.083)	0.065 (0.044)	-0.017 (0.070)	0.131*** (0.050)	0.088 (0.061)	0.144*** (0.034)	0.114*** (0.040)	0.054 (0.050)	-0.152 (0.180)
C&G level 3	0.025 (0.044)	0.134*** (0.017)	0.079*** (0.012)	0.067*** (0.012)	0.096*** (0.011)	0.097*** (0.010)	0.101*** (0.010)	0.136*** (0.012)	0.138*** (0.014)	0.179*** (0.025)
BTEC level 3	0.022 (0.018)	0.031*** (0.011)	0.090*** (0.011)	0.135*** (0.012)	0.166*** (0.014)	0.158*** (0.016)	0.139*** (0.018)	0.151*** (0.021)	0.116*** (0.024)	0.187*** (0.044)
NVQ level 3	0.059*** (0.014)	0.048*** (0.008)	0.036*** (0.010)	0.047*** (0.013)	0.034*** (0.013)	0.008 (0.013)	0.036** (0.015)	0.031** (0.015)	0.037* (0.022)	0.065 (0.060)

Note: Aggregated marginal returns to vocational qualifications – pooled Labour Force Survey data 1996-2009

Comparison group consists of level 2 qualifications, i.e. level 2 vocational and/or level 2 academic qualifications as a maximum
 * 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance. Standard errors in parentheses. Grey shaded cells indicate that the difference with the coefficient across all age-bands is significant at 5% level.

Source: *London Economics*

Interestingly, a slightly different pattern emerges when considering the returns associated with National Vocational Qualifications. In particular, individuals with NVQ level 3 qualifications achieve significant earnings returns when they are younger and middle aged – in the region of 4% to 8% compared to level 2 qualifications. However, there appears to be a slight erosion of this premium as age increases. This may in part reflect the relatively recent introduction of National Vocational Qualifications in the United Kingdom and the fact that it is only in the last few years that these qualifications have really embedded into the qualification infrastructure. It is important to note that this finding may result in some downward bias when considering the rate of return associated with National Vocational Qualifications. In particular, if it is the case that the earnings returns for younger people are greater than the earnings return in middle age, then any estimate of the lifetime benefits associated with NVQs using current age earnings profiles (rather than the age earnings profiles that might be expected based on acquisition aged between 17 and 20) will underestimate the expected benefits associated with this level and type of qualification attainment. Although of clear importance, given the limitations of the data, we are unable to account for this in our later rate of return analysis.

There are some interesting gender differences when we look at the impact of age on earnings returns for men and women separately. Specifically (and as would be expected), the returns to men (presented in Table 26) generally mimic the aggregate results, with the analysis indicating that the returns to level 3 City & Guilds and BTEC qualifications increase with age. However, the declining return to age associated with National Vocational Qualifications is more extreme for men, with men age below the age of 40 posting consistent returns in the region of 5.5%-9.2% ($\beta=0.053$ and 0.088), while men over the age of 41 post no statistically significant return compared to those in possession of level 2 qualifications.

Table 26: Marginal returns to level 3 qualifications by age – males

Age Band	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-64
RSA level 3	-0.176 (0.203)	-0.087 (0.279)	0.141** (0.071)	0.130 (0.150)	0.153** (0.064)	-0.352*** (0.029)	0.391*** (0.030)	-0.013 (0.098)	-0.089 (0.186)	-0.152 (0.180)
C&G level 3	0.033 (0.047)	0.143*** (0.018)	0.092*** (0.013)	0.069*** (0.012)	0.097*** (0.011)	0.104*** (0.011)	0.108*** (0.011)	0.146*** (0.012)	0.149*** (0.014)	0.179*** (0.025)
BTEC level 3	0.054** (0.024)	0.048*** (0.016)	0.105*** (0.015)	0.145*** (0.015)	0.174*** (0.018)	0.171*** (0.020)	0.138*** (0.023)	0.160*** (0.024)	0.116*** (0.027)	0.187*** (0.044)
NVQ level 3	0.070*** (0.022)	0.088*** (0.012)	0.068*** (0.013)	0.079*** (0.018)	0.053** (0.021)	0.013 (0.021)	0.014 (0.029)	0.014 (0.025)	0.050 (0.042)	0.065 (0.060)

Note: Aggregated marginal returns to vocational qualifications – pooled Labour Force Survey data 1996-2009. Comparison group consists of level 2 qualifications, i.e. level 2 vocational and/or level 2 academic qualifications as a maximum. * 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance. Standard errors in parentheses. Grey shaded cells indicate that the difference with the coefficient across all age-bands is significant at 5% level.

Source: London Economics

Table 27: Marginal returns to level 3 qualifications by age – females

Age Band	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60
RSA level 3	0.054 (0.140)	0.155** (0.076)	0.073 (0.045)	-0.024 (0.075)	0.140** (0.057)	0.103* (0.060)	0.157*** (0.034)	0.151*** (0.043)	0.088* (0.050)
C&G level 3	-0.022 (0.099)	0.059 (0.054)	-0.028 (0.034)	0.004 (0.036)	0.057 (0.043)	0.006 (0.038)	0.004 (0.029)	0.010 (0.043)	-0.053 (0.045)
BTEC level 3	-0.020 (0.027)	0.013 (0.016)	0.067*** (0.016)	0.111*** (0.020)	0.143*** (0.024)	0.121*** (0.026)	0.118*** (0.030)	0.054 (0.039)	-0.003 (0.045)
NVQ level 3	0.046*** (0.017)	0.002 (0.011)	0.002 (0.015)	0.005 (0.019)	0.021 (0.017)	0.004 (0.016)	0.041** (0.016)	0.029* (0.017)	0.021 (0.025)

Note: Aggregated marginal returns to vocational qualifications – pooled Labour Force Survey data 1996-2009. Comparison group consists of level 2 qualifications, i.e. level 2 vocational and/or level 2 academic qualifications as a maximum. * 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance. Standard errors in parentheses. Grey shaded cells indicate that the difference with the coefficient across all age-bands is significant at 5% level.

Source: London Economics

A similar picture emerges for women. Presented in Table 27, the econometric findings indicate that there are significant positive returns associated with RSA level 3 qualifications, and that those women in possession of RSA qualifications who are aged over 36 are the primary beneficiaries. Specifically, with the exception of women aged between 41 and 45, women over the age of 36 post earnings premiums of between 15% and 17% ($\beta=0.140$ and 0.157), while women below the age of 35 achieve more modest earnings gains (with the exception of those aged between 21 and 25). Unlike men, the returns to National Vocational Qualifications are not concentrated amongst the younger age groups. In particular, women achieve an earnings premium from NVQs at level 3 of between 4% and 5%, with the return relatively invariant to age.

3.6.2 Level 2 qualifications

There is some similarity in the results relating to the marginal returns to vocational qualifications at level 2 by age. In Table 28 below, we present the aggregate results, while in Table 29 and Table 30 we present the information for men and women separately.

In general, the marginal returns associated with level 2 vocational qualifications appear to be more concentrated in the upper age bands. Men with City & Guilds qualifications post returns in excess of 11.0% ($\beta=0.104$) compared to men in possession of level 1 qualifications above the age of 46. For women with RSA qualifications, there are again relatively high returns associated with level 2 qualifications at age 50 and over; however, there is a slight increase in the return as age increases. In terms of the relationship between the returns associated with BTEC qualifications and age, the evidence suggests that the relationship is slightly increasing in age.

Age Band	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-64
RSA level 2	-0.268*** (0.043)	0.014 (0.106)	0.127* (0.069)	0.183 (0.116)	-0.024 (0.069)	0.255*** (0.054)	0.164*** (0.062)	0.233*** (0.081)	0.182* (0.095)	0.212** (0.087)
C&G level 2	-0.044 (0.049)	0.072** (0.029)	0.042** (0.019)	0.043*** (0.016)	0.064*** (0.017)	0.067*** (0.018)	0.110*** (0.016)	0.119*** (0.019)	0.104*** (0.025)	0.187*** (0.048)
BTEC level 2	0.053 (0.075)	0.013 (0.043)	0.009 (0.034)	0.185*** (0.052)	0.047 (0.054)	-0.054 (0.058)	-0.147 (0.124)	0.113* (0.058)	0.316* (0.165)	0.000 (0.000)
NVQ level 2	-0.012 (0.015)	-0.006 (0.011)	-0.011 (0.015)	-0.039** (0.018)	-0.069*** (0.017)	-0.060*** (0.016)	-0.046*** (0.016)	-0.020 (0.020)	0.012 (0.021)	0.004 (0.093)

Note: Aggregated marginal returns to vocational qualifications – pooled Labour Force Survey data 1996-2009

Comparison group consists of level 1 qualifications, i.e. level 1 vocational and/or level 2 academic qualifications as a maximum

* 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance. Grey shaded cells indicate that the difference with the coefficient across all age-bands is significant at 5% level.

Source: *London Economics*

For men and for women separately, and as a group, the returns to NVQ level 2 qualifications replicate in part the relationship between age and earnings presented for qualification holders at NVQ level 3. For men aged between 21 and 35, there is no earnings return associated with possession of a NVQ level 2; however, as age increases, the return associated with NVQ level 2 qualifications decreases, with men aged between 36 and 45 posting a return of 8.7% less than the comparison group ($\beta=-0.091$). This decreasing relationship between age and earnings return may result in an underestimate of the lifetime and Exchequer benefits associated with National Vocational Qualifications, as well as an underestimate of the individual and Exchequer rates of return.

Table 29: Marginal returns to level 2 qualifications by age – Males

Age Band	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-64
RSA level 2	-0.827*** (0.109)	0.172*** (0.036)	-0.263** (0.114)	0.475*** (0.109)	-0.721*** (0.043)	0.210* (0.116)	0.090 (0.108)	0.161** (0.074)	0.485 (0.427)	0.212** (0.087)
C&G level 2	-0.027 (0.059)	0.096*** (0.031)	0.064*** (0.021)	0.043*** (0.017)	0.069*** (0.018)	0.079*** (0.020)	0.115*** (0.017)	0.134*** (0.021)	0.118*** (0.025)	0.187*** (0.048)
BTEC level 2	0.131 (0.120)	0.031 (0.059)	0.033 (0.060)	0.179** (0.086)	0.073 (0.080)	0.003 (0.080)	-0.179 (0.152)	0.138 (0.113)	0.332* (0.169)	0.000 (0.000)
NVQ level 2	0.002 (0.020)	-0.001 (0.016)	0.016 (0.019)	-0.024 (0.025)	-0.091*** (0.023)	-0.092*** (0.027)	-0.048* (0.026)	-0.062 (0.042)	0.023 (0.032)	0.004 (0.093)

Note: Aggregated marginal returns to vocational qualifications – pooled Labour Force Survey data 1996-2009

Comparison group consists of level 1 qualifications, i.e. level 1 vocational and/or level 2 academic qualifications as a maximum

* 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance. Grey shaded cells

indicate that the difference with the coefficient across all age-bands is significant at 5% level.

Source: *London Economics*

For women aged below 25, there is no earnings return associated with possession of a NVQ level 2; however, as age increases, the return associated with NVQ level 2 qualifications also decreases, with women aged between 31 and 35 posting 5.9% less ($\beta=-0.061$), and those aged between 46 and 50 earning approximately 5.0% less than the comparison group ($\beta=-0.051$). This information is presented in Table 30.

Table 30: Marginal returns to level 2 qualifications by age – Females

Age Band	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60
RSA level 2	-0.349*** (0.072)	0.010 (0.124)	0.189*** (0.071)	0.094 (0.135)	0.027 (0.049)	0.254*** (0.060)	0.193*** (0.068)	0.232** (0.093)	0.145** (0.066)
C&G level 2	-0.102 (0.082)	-0.146** (0.071)	-0.063 (0.047)	0.028 (0.052)	0.007 (0.042)	-0.042 (0.045)	0.038 (0.048)	-0.011 (0.058)	-0.167 (0.126)
BTEC level 2	-0.079 (0.058)	-0.012 (0.064)	-0.008 (0.042)	0.203*** (0.062)	0.021 (0.079)	-0.102 (0.096)	-0.256*** (0.042)	0.145** (0.060)	0.296 (0.315)
NVQ level 2	-0.026 (0.023)	-0.019 (0.016)	-0.050** (0.024)	-0.061** (0.025)	-0.039 (0.024)	-0.034* (0.019)	-0.051*** (0.019)	-0.009 (0.022)	-0.022 (0.027)

Note: Aggregated marginal returns to vocational qualifications – pooled Labour Force Survey data 1996-2009

Comparison group consists of level 1 qualifications, i.e. level 1 vocational and/or level 2 academic qualifications as a maximum

* 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance. Grey shaded cells

indicate that the difference with the coefficient across all age-bands is significant at 5% level.

Source: *London Economics*

3.6.2 Level 1 qualifications

In Table 31 to Table 33, we present the equivalent information for those in possession of level 1 qualifications; however, it is important to note that in general the sample sizes are smaller and as such the results are a little more volatile than those relating to either level 2 or level 3 qualifications. We would suggest that less weight is placed on the results presented in this section.

In general terms, the results replicate those seen previously, with men in possession of City & Guilds qualifications at level 1 again posting positive returns compared to those in possession of no formally recognised qualifications, where the earnings premium increases marginally with age. There are some very large returns associated with BTEC qualifications; however, these are associated with

small sample sizes and should be treated with caution. The returns associated with NVQ level 1 qualifications appear (in general) to be statistically insignificantly different from zero and are age invariant.

Table 31: Marginal returns to level 1 qualifications by age – All

Age Band	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-64
RSA level 1	0.080 (0.112)	0.128** (0.056)	0.087 (0.058)	0.120*** (0.037)	0.071* (0.039)	0.171*** (0.026)	0.174*** (0.018)	0.181*** (0.016)	0.207*** (0.021)	-0.102 (0.128)
C&G level 1	0.050 (0.084)	0.077* (0.040)	0.096** (0.042)	0.086** (0.035)	0.055 (0.035)	0.095*** (0.027)	0.089*** (0.024)	0.061** (0.026)	0.102*** (0.031)	0.091 (0.056)
BTEC level 1	-0.151 (0.162)	-0.139** (0.070)	0.214 (0.153)	0.246*** (0.067)	0.018 (0.171)	0.281*** (0.098)	0.081 (0.072)	0.093 (0.119)	0.360*** (0.049)	0.000 (0.000)
NVQ level 1	-0.117** (0.054)	-0.022 (0.030)	0.001 (0.044)	-0.017 (0.043)	-0.025 (0.041)	-0.039 (0.031)	-0.042 (0.034)	0.002 (0.032)	0.012 (0.035)	-0.007 (0.110)

Note: Aggregated marginal returns to vocational qualifications – pooled Labour Force Survey data 1996-2009

Comparison group consists of those in possession of no formally recognised qualifications

* 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance. Grey shaded cells indicate that the difference with the coefficient across all age-bands is significant at 5% level.

Source: London Economics

Table 32: Marginal returns to level 1 qualifications by age – males

Age Band	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-64
RSA level 1	-0.267** (0.109)	0.217 (0.200)	0.009 (0.130)	-0.090 (0.087)	-0.136** (0.066)	-0.008 (0.109)	0.037 (0.059)	0.179*** (0.057)	0.211*** (0.079)	-0.102 (0.128)
C&G level 1	0.130* (0.069)	0.075 (0.047)	0.117** (0.049)	0.106*** (0.038)	0.066* (0.038)	0.096*** (0.031)	0.104*** (0.028)	0.097*** (0.030)	0.114*** (0.034)	0.091 (0.056)
BTEC level 1	0.100 (0.104)	-0.136* (0.081)	0.361** (0.179)	0.197*** (0.074)	0.216* (0.120)	0.089 (0.099)	0.110 (0.095)	0.166 (0.152)	0.370*** (0.060)	0.000 (0.000)
NVQ level 1	0.012 (0.055)	-0.012 (0.037)	0.010 (0.054)	-0.048 (0.059)	-0.043 (0.055)	-0.014 (0.047)	-0.036 (0.056)	-0.018 (0.055)	0.017 (0.049)	-0.007 (0.110)

Note: Aggregated marginal returns to vocational qualifications – pooled Labour Force Survey data 1996-2009

Comparison group consists of those in possession of no formally recognised qualifications

* 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance. Grey shaded cells indicate that the difference with the coefficient across all age-bands is significant at 5% level.

Source: London Economics

As presented in Table 33, there are large and significant returns for women associated with the possession of RSA qualifications; however, these too appear to be relatively age invariant.

Table 33: Marginal returns to level 1 qualifications by age – females

Age Band	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60
RSA level 1	0.200** (0.095)	0.154** (0.066)	0.121* (0.065)	0.197*** (0.039)	0.128*** (0.044)	0.194*** (0.027)	0.182*** (0.019)	0.181*** (0.017)	0.193*** (0.020)
C&G level 1	-0.109 (0.210)	0.023 (0.081)	-0.030 (0.071)	0.001 (0.054)	-0.086 (0.089)	0.062 (0.058)	0.010 (0.039)	-0.051 (0.051)	0.002 (0.074)
BTEC level 1	-0.162 (0.220)	-0.278*** (0.101)	-0.491*** (0.167)	0.362* (0.187)	-0.093 (0.221)	0.404*** (0.125)	0.050 (0.077)	-0.002 (0.175)	0.336*** (0.063)
NVQ level 1	-0.251*** (0.097)	-0.055 (0.058)	0.012 (0.083)	-0.001 (0.056)	0.010 (0.061)	-0.076* (0.040)	-0.056 (0.039)	0.004 (0.035)	0.032 (0.045)

Note: Aggregated marginal returns to vocational qualifications – pooled Labour Force Survey data 1996-2009

Comparison group consists of those in possession of no formally recognised qualifications

* 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance. Grey shaded cells indicate that the difference with the average coefficient is significant at 5% level.

Source: London Economics

3.7 Marginal earnings returns by place of acquisition

3.7.1 National Vocational Qualifications at level 3

In this section, we consider whether there is any difference in the economic returns associated with different types of qualification attainment depending on the place of acquisition. In Table 34, we provide information on the returns associated with NVQ level 3 qualifications for men and women (separately and in aggregate), while in Table 35, we present the equivalent information for individuals in possession of NVQ qualifications at level 2. In Table 39 and Table 40, we present the equivalent information for individuals in possession of City & Guilds qualifications at level 2 and level 3 respectively.

For NVQ level 3 qualifications, although there is in general a positive return associated with qualification attainment irrespective of the mode, for those individuals acquiring the qualification through a combination of workplace and classroom based learning, the returns are the greatest. This is especially the case for men, where relative to possession of no formally recognised qualifications, the acquisition of the qualification through a combination of modes provides them with a return of approximately 22.9% ($\beta=0.206$) compared to a return of 15.3% ($\beta=0.142$) when the qualification is acquired through a classroom based route only, and 12.1% ($\beta=0.114$) when the qualification is workplace based only. Interestingly, this result is replicated when we consider City & Guilds qualifications at level 3 (Table 39), though to a lesser extent. The earnings premium associated with attaining a City & Guilds level 3 qualification through workplace attainment (solely) is marginally less than the return posted by men achieving the qualification through a combination of routes or in through the classroom route only (24.2% compared to 24.4% with associated coefficients of $\beta=0.217$ and 0.218).

Table 34: Marginal returns to NVQ level 3 qualifications – by place of attainment (LE analysis, 1996-2009)

Comparison	Level 2			No Qualifications		
	All	Male	Female	All	Male	Female
Solely through school college etc	0.031*** (0.009)	0.033** (0.014)	0.018* (0.011)	0.128*** (0.033)	0.142*** (0.054)	0.085** (0.039)
Solely at place of work	0.026*** (0.008)	0.043*** (0.013)	0.014 (0.011)	0.105*** (0.022)	0.114*** (0.037)	0.097*** (0.027)
Workplace and educational institutions	0.069*** (0.009)	0.132*** (0.013)	0.011 (0.012)	0.132*** (0.031)	0.206*** (0.052)	0.074** (0.037)
Government training ¹⁶	0.012 (0.065)	-0.081 (0.082)	0.170** (0.085)	0.170** (0.074)	0.026 (0.137)	0.219*** (0.046)
Some other way/don't know	0.014 (0.032)	0.025 (0.047)	-0.008 (0.039)	0.344*** (0.131)	0.376** (0.182)	0.275*** (0.025)

Note: Aggregated marginal returns to vocational qualifications – pooled Labour Force Survey data 1996-2009. level 2: level 2 vocational and/or level 2 academic qualifications as a maximum. No Qualifications: No formally recognised qualifications. * 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance. Grey shaded cells indicate that the difference with the baseline (solely at place of work) is significant at 5% level.

Source: *London Economics*

Returning to NVQ routes of acquisition, the analysis indicates that women achieve the highest premium when the NVQ is attained through government training schemes. In particular, women gaining NVQ level 3 qualifications through this route achieve an 18.5% premium ($\beta=0.170$) over those in possession of level 2 qualifications, compared to approximately 1.1% ($\beta=0.011$ though statistically insignificant) when obtained through the combined workplace and classroom based route, although for this element of the analysis, the sample sizes are quite small.

3.7.2 National Vocational Qualifications at level 2

In relation to route of acquisition of National Vocational Qualifications at level 2, the results are presented in Table 35. To place these results in context, in the previous analysis, we illustrated that the estimate of the marginal return to a NVQ level 2 qualification across all holders was estimated to be statistically insignificantly different from zero compared to possession of no formally recognised qualifications ($\beta=-0.005$ in Table 9).

For men, the mode of acquisition of NVQ level 2 qualifications is relatively insignificant. Men acquiring NVQ level 2 qualifications solely through the classroom route are estimated to earn approximately 4.3% more ($\beta=0.043$) compared no formally recognised qualifications, while men who obtain a NVQ level 2 solely through the work route or through a combination of work and the classroom post a zero return (compared to possession of no formally recognised qualifications).

¹⁶ Based on information contained in the Labour Force Surveys, government employment and training programs incorporate the following categories of response: Work based training for young people (GB only aged 16-25), New Deal (age 18+ only), Work based learning for adults/training for work (GB only), Job Skills (NI only), Worktrack (NI only), and "any other training scheme"

Compared to possession of no formally recognised qualifications, women who acquired a NVQ level 2 through the combined route are estimated to earn 9% less relative to those with no formally recognised qualifications ($\beta=-0.092$), while women gaining the qualification solely through the workplace earn 2.8% less ($\beta=-0.029$).

Table 35: Marginal returns to NVQ level 2 qualifications – by place of attainment (LE analysis, 1999-2009)

Comparison	Level 1			No Qualifications		
	All	Male	Female	All	Male	Female
Solely through school college etc	-0.015 (0.011)	-0.037** (0.0158)	-0.007 (0.0139)	0.022 (0.025)	0.043 (0.032)	-0.012 (0.040)
Solely at place of work	-0.015* (0.008)	-0.016 (0.0132)	-0.0216** (0.0105)	-0.009 (0.014)	0.008 (0.024)	-0.029* (0.016)
Workplace and educational institution	-0.021* (0.012)	-0.010 (0.0160)	-0.0416** (0.0180)	-0.049* (0.029)	-0.015 (0.035)	-0.092** (0.042)
Government training	-0.046 (0.032)	-0.079** (0.0383)	0.012 (0.0537)	-0.029 (0.060)	-0.014 (0.077)	-0.069 (0.081)
Some other way/don't know	0.070* (0.040)	0.148*** (0.0567)	-0.029 (0.0501)	0.132 (0.089)	0.111 (0.144)	0.144** (0.069)

Note: Aggregated marginal returns to vocational qualifications – pooled Labour Force Survey data 1999-2009

Level 1: level 1 vocational and/or level 1 academic qualifications as a maximum. No Qualifications: No formally recognised qualifications. * 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance. Grey shaded cells indicate that the difference with the baseline (Solely at place of work) is significant at 5% level.

Source: *London Economics*

3.7.3 Comparing analyses

There are some similarities and differences in the results presented in section 0 and those presented by other leading authors in the field. In particular, the results presented in this report indicate that the returns associated with the acquisition of National Vocational Qualifications through a combination of the workplace and classroom learning are less than the returns associated with workplace only qualifications, while there are essentially no returns associated with the acquisition of NVQ level 2 qualifications either solely in the workplace or solely through the classroom route.

In contrast, Dearden *et al* (2004) estimate that men achieve a 7.1% earnings premium ($\beta=0.069$) from NVQ level 2 qualifications attained in the workplace compared to -7.8% ($\beta=-0.081$) associated with qualifications attained solely through the classroom route (compared to possession of no formally recognised qualifications). The Dearden *et al* (2004) results for women are similar to those presented for men in terms of workplace based qualifications; however, women attaining qualifications solely through the classroom route achieve no earnings return relative to those in possession of no formally recognised qualifications (as with our work). The Dearden *et al* (2004) results are presented in Table 36. Generally, similar results to Dearden *et al* (2004) are presented by Jenkins *et al* (2007) using information from the Labour Force Surveys up to 2006.

In essence, the Dearden *et al* (2004) results illustrate greater variation compared to the results presented here, with some significant differences being illustrated depending on the route of qualification attainment. In our analysis presented above

in Table 35, we find that the return to vocational qualifications has limited dependence on the route of acquisition.

Table 36: Marginal returns to NVQ level 2 qualifications – by place of attainment (Dearden *et al* (2004), 1996-2002)

Comparison	Level 1		No Qualifications	
	Male	Female	Male	Female
Solely through school college etc	-0.116** (0.020)	-0.009 (0.011)	-0.081* (0.036)	0.002 (0.022)
Solely at place of work	0.0180 (0.0160)	0.017 (0.011)	0.069** (0.022)	0.058** (0.017)
Workplace and educational institution	-	-	-	-
Government training	-0.225** (0.035)	-0.116** (0.046)	-0.252** (0.065)	-0.125 (0.143)
Some other way/don't know	-0.085** (0.026)	-0.019 (0.016)	-0.070 (0.058)	0.054 (0.028)
Academic level 1	0.135** (0.035)	0.103** (0.004)		
Vocational level 1	0.069** 0.004	0.090** (0.003)		
Number NVQ2 school	512	1145	143	243
Number NVQ2 workplace	698	1323	312	576
Number NVQ2 combined	-	-	-	-
Number NVQ2 government	150	121	57	19
Number NVQ2 other	328	638	85	203
Observations	60698	79732	19,309	26,703
R-squared	0.15	0.12	0.10	0.08

Note: Aggregated marginal returns to vocational qualifications – pooled Labour Force Survey data 1996-2002

Level 1: level 1 vocational and/or level 1 academic qualifications as a maximum. No Qualifications: No formally recognised qualifications. * 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance.

Source: Dearden (2002)

Given the differences in the results, we have returned to the original Dearden *et al* (2004) analysis in an attempt to understand exactly why our results differ from theirs. In essence there are a number of different methodological issues including the timeframe of analysis; the movement from seasonal to quarterly data; the place of acquisition variable used; the treatment group; and the coding of the variables that explain the bulk of the differences. For completeness, we discuss these in detail in the following paragraphs, and adopting our best assessment of these methodological differences, we successfully replicate the Dearden *et al* (2004) analysis in Table 37. The most important factor contributing to the differences in our findings with those presented by Dearden *et al* (2004) refer to the timeframe under consideration.

Changes in the underlying data sets

The LFS switched from seasonal to calendar quarters in May 2006 and that this may have caused an inconsistency in some variables. In particular, information on place of attainment is no longer readily available in the LFS datasets for the pre-2005 period. Despite this, we obtained data for seasonal quarters directly from the UK Data Archive and, where possible, we linked the information on place of

acquisition from the seasonal quarters to the calendar quarters using individual reference identifiers. Also, given that the question on place of acquisition is only asked in spring quarters, we linked information on place of acquisition to wage information (which is gathered in wave one and wave five only)¹⁷. We also use information from 1999 (rather than 1996) onwards, given that in 1999 the LFS introduced a question explicitly asking about the place of attainment for the highest vocational qualification held¹⁸. Moreover, the question on place of attainment of the (overall) highest qualification was slightly modified in 1999, and this prompted us not to use data from earlier years.

Different samples

There are also some differences in the sample used for the regression analysis that may explain some of the differences in the results obtained. From what we can deduce from the methodological approach described in the Dearden *et al.* (2004) paper, they include all observations in the sample with wage information available (considering both wave one and wave five)¹⁹ and include in the sample both full-time and part-time employees²⁰ (the inclusion of part time employment is one of the main reasons why the Jenkins *et al.* (2006) analysis replicates the Dearden *et al.* (2004) analysis). We only keep data relative to wave one²¹, in order to avoid duplication of the same respondent in the pooled dataset and we only include full-time employees in our analysis. Moreover there are also some differences in the model used for the regression analysis (following the methodological approach presented by McIntosh (2002)). Specifically, we include as control variables all variables included in the Dearden model (age, age squared, region, ethnicity, employer type and size); however, we also add time controls, in order to capture differences in the labour market over the time period and a variable controlling for the length of time continuously employed, which should capture the positive effect of the absence of significant labour market shocks and also, to some extent, control for experience in the labour market.

Similar to Dearden *et al.* (2004), we estimate the return to acquiring an NVQ level 2²² as highest qualification (and only qualification at level 2²³) following different routes, compared to two different comparison groups: one group including all respondents of working age holding a level 1 qualification or below at maximum,

¹⁷ The information was linked across different datasets using the variable *Caseno*, which should give every case in the dataset a unique identifier. Information for observations recording the same value for the variable *Caseno* was not linked.

¹⁸ Two questions are asked in the LFS on place of attainment: the first focuses on how the highest (academic or vocational/professional) qualification was obtained, while the other enquires about the place of attainment for the highest vocational qualification. When a vocational qualification is held as highest and is the sole qualification at that level, the two variables should coincide (barring inaccuracies or inconsistencies in the variables coding).

¹⁹ In page 9 of the Dearden report, the authors state "For our analysis we pool quarterly data from the LFS from the spring 1996 through the spring 2002. We only include individuals in survey waves where respondents are asked about wages. The survey only asks respondents about wages in the first and fifth waves of the survey".

²⁰ Dearden *et al.* (2004) never explicitly mention full-time and part-time employees, but the sample size available for their analysis appears to be consistent with the inclusion of both in the regression model.

²¹ With the exception of 1996, where information on wages is only asked in wave 5.

²² In our analysis, NVQs at level 2 are grouped together with GNVQs at intermediate level, while they are in two separate groups in the Dearden analysis.

²³ However, we allow respondents to have an NVQ2 and a trade apprenticeship, given that a trade apprenticeship can form part of an NVQ2 course. Also apprenticeships are considered separately from academic and vocational qualifications in the LFS questionnaire.

and another comparison group including respondents with no academic or vocational qualifications²⁴.

Replication of results

When we undertake the analysis using those assumptions contained in the Dearden et al (2004) research work, we generate the findings presented in Table 37 below. Through comparison with Table 36, there is a high degree of consistency in the results presented.

Comparison	Level 1				No Qualifications			
	1996-2002		2003-2009		1996-2002		2003-2009	
	Male	Female	Male	Female	Male	Female	Male	Female
Solely through school college etc	-0.119*** (0.013)	-0.046*** (0.010)	-0.073*** (0.013)	-0.040*** (0.009)	-0.100*** (0.035)	0.005 (0.026)	0.036 (0.031)	0.051* (0.029)
Solely at place of work	-0.008 (0.012)	0.007 (0.008)	-0.053*** (0.010)	-0.025*** (0.006)	0.059** (0.027)	0.064*** (0.015)	0.012 (0.022)	0.049*** (0.012)
Workplace and educational institution	-0.076*** (0.020)	-0.028** (0.014)	-0.048*** (0.014)	-0.045*** (0.011)	-0.086** (0.041)	0.042 (0.029)	-0.002 (0.039)	0.004 (0.028)
Government training	-0.218*** (0.027)	-0.102*** (0.031)	-0.161*** (0.034)	-0.003 (0.042)	-0.235*** (0.059)	-0.139*** (0.053)	-0.088 (0.061)	-0.033 (0.058)
Some other way/don't know	-0.067 (0.052)	-0.056 (0.038)	0.072 (0.065)	-0.007 (0.033)	-0.216 (0.250)	-0.071 (0.124)	0.113 (0.138)	0.122** (0.054)
Academic level 1	0.134*** (0.004)	0.112*** (0.003)	0.106*** (0.004)	0.091*** (0.004)				
Vocational level 1	0.073*** (0.004)	0.094*** (0.003)	0.080*** (0.004)	0.079*** (0.003)				
Number NVQ2 school	736	1,389	810	1,494	78	130	108	162
Number NVQ2 workplace	766	1,432	1,257	2,342	169	385	209	479
Number NVQ2 combined	325	649	645	1,018	41	108	62	158
Number NVQ2 government	155	130	76	63	32	15	12	11
Number NVQ2 other	38	66	59	93	4	6	9	22
Observations	58,764	79,679			18,170	25,717		
R-squared	0.161	0.124	53,232	55,544	0.108	0.076	13,099	14,621

Note: Aggregated marginal returns to vocational qualifications – pooled Labour Force Survey data 1996-2002

Level 1: level 1 vocational and/or level 1 academic qualifications as a maximum. No Qualifications: No formally recognised qualifications. * 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance.

Source: *London Economics*

Given the high degree of consistency in the results generated between the original Dearden *et al* (2004) paper (Table 36) and our replication of these results (Table 37 (1996-2002)), we have replicated the Dearden *et al* (2004) approach for the period 2003-2009 in Table 38. **The results are very significant.** The analysis illustrates that when adopting the Dearden *et al* (2004) modelling approach (compared to no formally recognised qualifications), the negative returns posted by men acquiring a NVQ level 2 qualification solely through the classroom route between 1996 and 2002 disappear. Women acquiring NVQ level 2 qualifications solely through the classroom route now achieve a 5.1% earnings premium compared to a statistically insignificant earnings return previously. In addition, for men, the positive return associated with the workplace route of acquisition and the

²⁴ Another difference with Dearden is that they appear to consider only respondents in working age aged 19 or above, while we include all respondents in working age aged 16 or above.

negative return associated with the combined route both disappear, while the negative returns posted by women acquiring qualifications through government training are also eliminated. Removing time controls and moving from full-time and part-time to full-time only explains why the positive return for women evaporates. Adopting the methodological approach of Dearden *et al.* (2004), the analysis basically indicates that over time, the route of NVQ level 2 route of qualification acquisition has become much less important in determining the earnings of those acquiring the qualification, and that earnings premiums are essentially independent of the route of acquisition. These results may have significant policy implications. In Table 38 below, we have reverted to the original London Economics' methodological approach adopted in Table 35 and consider whether there has been any change over time in the earnings premiums to National Vocational Qualifications at level 2 depending on the place of acquisition.

Table 38: Marginal returns to NVQ level 2 qualifications – by place of attainment 1996 – 2009 (LE analysis)

Comparison	Level 1				No Qualifications			
	1999-2002		2003-2009		1999-2002		2003-2009	
	Male	Female	Male	Female	Male	Female	Male	Female
Solely through school college etc	-0.085*** (0.025)	-0.016 (0.023)	-0.042** (0.019)	-0.019 (0.016)	0.017 (0.055)	-0.121 (0.099)	0.051 (0.039)	0.030 (0.042)
Solely at place of work	-0.016 (0.021)	-0.029* (0.017)	-0.057*** (0.014)	-0.043*** (0.012)	0.048 (0.045)	-0.045 (0.030)	-0.007 (0.028)	-0.022 (0.020)
Workplace and educational institution	-0.050* (0.030)	-0.063** (0.029)	-0.032* (0.018)	-0.052** (0.021)	-0.086 (0.055)	-0.098* (0.059)	0.005 (0.042)	-0.085 (0.054)
Government training	-0.153*** (0.051)	0.119 (0.096)	-0.049 (0.056)	-0.054 (0.060)	-0.092 (0.128)	0.000 (0.000)	0.057 (0.076)	-0.066 (0.083)
Some other way/don't know	0.033 (0.058)	-0.178 (0.108)	0.161* (0.087)	0.004 (0.049)	0.171** (0.084)	0.000 (0.000)	0.076 (0.250)	0.139* (0.073)
Academic level 1	0.160*** (0.009)	0.131*** (0.010)	0.136*** (0.007)	0.136*** (0.007)				
Vocational level 1	0.072*** (0.009)	0.078*** (0.009)	0.064*** (0.007)	0.049*** (0.008)				
Number NVQ2 school	210	199	376	399	24	17	68	58
Number NVQ2 workplace	244	286	536	610	51	73	118	160
Number NVQ2 combined	147	153	344	298	14	23	45	56
Number NVQ2 government	36	11	29	19	7	0	7	7
Number NVQ2 other	15	11	27	24	3	0	4	5
Observations								
R-squared	19,780	11,259	29,635	16,098	5,442	3,167	8,038	4,385

Note: Aggregated marginal returns to vocational qualifications – pooled Labour Force Survey data 1996-2002

Level 1: level 1 vocational and/or level 1 academic qualifications as a maximum. No Qualifications: No formally recognised qualifications. * 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance.

Source: London Economics

As can be seen, adopting our original methodological approach and applying this approach to the shorter time periods of 1999-2002 and 2003-2009 has little impact on the results; however, the sub-division of the analysis into shorter time periods demonstrates that the methodological approach we adopted and that adopted by Dearden are very similar. In other words, there does appear to have been a fundamental change in the earnings premium achieved by route of acquisition over time that is driving the results rather than the precise model specification.

Between 1999 and 2002, we estimated that men achieve a (statistically insignificant) 4.8% earnings premium when the qualification is obtained through the workplace only ($\beta=0.048$) and a zero return when the qualification is obtained through a classroom based route only ($\beta=-0.017$). These estimates are essentially unchanged when considering the later period of 2003-2009 (the coefficients have changed although the results remain statistically insignificant). The main difference in the estimates relating to the aggregate time periods and sub-periods is that for women, the 9.3% negative return ($\beta=-0.098$) associated with obtaining a NVQ level 2 through the combined route between 1999 and 2002 becomes statistically insignificant when considering the period 2003-2009.

Although there are a number of differences in the model specifications between those presented in this paper and those presented by other authors in the field, the differences are cannot be easily explained through the differences in the model specification, the potential differences in the sample considered (e.g. duplicate earnings information) or the administration of the survey.

The primary reason for the change in the impact of the route of qualification attainment on earnings appears to be the timeframe under consideration.

When undertaking a replication of the previous methodological approaches in the field for a later time period, we found that when previously there were positive returns associated with workplace attainment and negative returns associated with classroom attainment, these differences disappeared in the more recent period of analysis.

3.7.4 City & Guilds qualifications

In the previous sub-section, we made some reference to the returns associated with City & Guilds qualifications, and in Table 39 and Table 40, we present information on the return for men (only) by level of qualification (as sample sizes for women were insufficient).

Comparison	Level 2			No Qualifications		
	All	Male	Female	All	Male	Female
Solely through school college etc	-	0.108*** (0.010)	-	-	0.218*** (0.022)	-
Solely at place of work	-	0.081*** (0.020)	-	-	0.170*** (0.043)	-
Workplace and educational institution	-	0.110*** (0.007)	-	-	0.217*** (0.014)	-
Government training	-	-0.032 (0.122)	-	-	0.403*** (0.023)	-
Some other way/don't know	-	0.037 (0.036)	-	-	0.119* (0.066)	-

Note: Aggregated marginal returns to vocational qualifications – pooled Labour Force Survey data 2005-2009

Level 2: level 2 vocational and/or level 2 academic qualifications as a maximum; No Qualifications: No formally recognised qualifications. * 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance. Grey shaded cells indicate that the difference with the baseline (Solely at place of work) is significant at 5% level.

Source: London Economics

Fundamentally, there is little difference in the returns depending on where the qualifications are attained. Men in possession of level 3 City & Guilds qualifications achieve a return of between 8.4% and 11.6% ($\beta=0.081$ and $\beta=0.110$), with the larger return (compared to those in possession of level 2 qualifications) achieved by men gaining their qualification through a combination of workplace and classroom based study. A similar outcome is observed when comparing the returns to those in possession of no formally recognised qualifications.

When considering the returns associated with level 2 City & Guilds qualifications, there are again slightly higher returns associated with the acquisition of these qualifications through the combined route. The results presented here indicate that for men, there is a slight premium associated with gaining vocational qualifications through a combination of the workplace based and classroom based setting. This is presented overleaf.

Comparison	Level 1			No Qualifications		
	All	Male	Female	All	Male	Female
Solely through school college etc	-	0.077*** (0.015)	-	-	0.139*** (0.028)	-
Solely at place of work	-	0.083*** (0.024)	-	-	0.091* (0.049)	-
Workplace and educational institution	-	0.116*** (0.012)	-	-	0.179*** (0.021)	-
Government training	-	-0.011 (0.062)	-	-	0.191*** (0.020)	-
Some other way/don't know	-	0.166*** (0.050)	-	-	0.257*** (0.062)	-

Note: Aggregated marginal returns to vocational qualifications – pooled Labour Force Survey data 2005-2009

Level 1: level 1 vocational and/or level 1 academic qualifications as a maximum; No Qualifications: No formally recognised qualifications. * 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance. Grey shaded cells indicate that the difference with the baseline (Solely at place of work) is significant at 5% level.

Source: *London Economics*

3.8 Marginal earnings returns by age of acquisition

3.8.1 Level 3 qualifications

In this section, we provide some information on the returns associated with different levels of vocational qualification depending on the age of acquisition. The information in Table 41 relates to individuals in possession of City & Guilds qualifications at level 3, while Table 42 provides some information on the marginal returns achieved by men in possession of BTEC level 3 qualifications.

Table 41: Marginal returns to level 3 City & Guilds qualifications – by age of acquisition

Comparison	Level 2			No Qualifications		
	All	Males	Females	All	Males	Females
15-16	0.101** (0.041)	0.097** (0.044)	-0.022 (0.077)	0.144 (0.145)	0.135 (0.141)	0.000 (0.000)
17-18	0.103*** (0.015)	0.116*** (0.016)	0.033 (0.036)	0.169*** (0.037)	0.200*** (0.038)	-0.077 (0.115)
19-20	0.127*** (0.009)	0.123*** (0.009)	-0.017 (0.037)	0.227*** (0.018)	0.220*** (0.019)	0.224*** (0.065)
21-25	0.130*** (0.010)	0.119*** (0.010)	0.066 (0.070)	0.242*** (0.018)	0.230*** (0.018)	0.800*** (0.286)
26-30	0.055** (0.027)	0.046 (0.029)	0.014 (0.056)	0.202*** (0.060)	0.220*** (0.066)	-0.013 (0.055)
>30	0.041** (0.021)	0.053** (0.024)	-0.027 (0.041)	0.224*** (0.061)	0.245*** (0.067)	0.045 (0.127)

Note: Aggregated marginal returns to vocational qualifications – pooled Labour Force Survey data 2001-2009

Level 2: level 2 vocational and/or level 2 academic qualifications as a maximum; No Qualifications: No formally recognised qualifications, * 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance. Grey shaded cells indicate that the difference with the baseline (age group 17-18) is significant at 5% level.

Source: *London Economics*

For men with City & Guilds qualifications at level 3, there appears to be some earnings advantage associated with gaining the qualifications below the age of 25, where the average earnings premium stands at between 10.0% and 12.6% ($\beta=0.097$ to 0.119) compared to those in possession of level 2 academic or vocational qualifications. Although slightly lower, there continues to be a significant premium associated with gaining the qualification after the age of 25, where the returns stand at between 5% and 6% ($\beta=0.046$ to 0.053). The returns to women in possession of these qualifications are essentially invariant to the age of acquisition.

A similar outcome is illustrated for those in possession of BTEC level 3 qualifications, where the marginal earnings premium associated with this qualification ranges between 12.0% and 15.3% ($\beta=0.113$ to 0.142) for those when the qualification was acquired below the age of 25, while the earnings premium associated with acquisition above the age of 30 stands at approximately 6.9% ($\beta=0.067$). For women the relationship between earnings premium and age of acquisition is less clear cut. Women who obtained the qualification between the ages of 17 and 25 achieve an earnings premium of between 5.8% and 14.9% ($\beta=0.056$ to 0.139), while women who obtained a BTEC level 3 between the ages of 26 and 30 achieve a marginal earnings return of approximately 15.3% ($\beta=0.14$). This compares to women who obtained the qualification above the age of 30 who achieve a 5.1% return ($\beta=0.050$) over women with level 2 qualifications. Importantly, however, the analysis indicates that there is still a positive return to qualification attainment irrespective of the age of acquisition.

Table 42: Marginal returns to level 3 BTEC qualifications – by age of acquisition

Comparison	Level 2			No Qualifications		
	All	Males	Females	All	Males	Females
15-16	0.113*** (0.042)	0.141** (0.059)	0.056 (0.053)	-	-	-
17-18	0.136*** (0.012)	0.125*** (0.017)	0.139*** (0.016)	-	-	-
19-20	0.142*** (0.014)	0.158*** (0.016)	0.068** (0.027)	-	-	-
21-25	0.126*** (0.018)	0.131*** (0.020)	0.060* (0.034)	-	-	-
26-30	0.110*** (0.027)	0.086*** (0.033)	0.140*** (0.044)	-	-	-
>30	0.067*** (0.022)	0.092*** (0.034)	0.050* (0.026)	-	-	-

Note: Aggregated marginal returns to vocational qualifications – pooled Labour Force Survey data 2001-2009. Level 2: level 2 vocational and/or level 2 academic qualifications as a maximum. No Qual: No formally recognised qualifications

* 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance. Grey shaded cells indicate that the difference with the baseline (age group 17-18) is significant at 5% level.

Source: London Economics

In Table 43, we provide information on the marginal returns associated with NVQ level 3 qualifications. The analysis indicates that for both men and for women, there appears to be a positive return associated with obtaining these qualifications earlier in life. For men who obtained the qualification between the ages of 17 and 25, there is a return of between 10.3% and 18.1% ($\beta=0.098$ and 0.166 respectively) compared to those in possession of level 2 qualifications, while men who obtained the qualification between the ages of 26 and 30 achieve a 10.1% return ($\beta=0.096$). This compares to men who achieve a zero return if they gained the qualification above the age of 30. Table 43 also illustrates the impact of the age of qualification acquisition on earnings returns for women. Age of acquisition has a clear impact on earnings returns with women who obtain their NVQ level 3 qualification between the ages of 17 and 25 posting a 4.5-6.5% premium over those women that obtain the qualification later in life ($\beta=0.044$ and 0.062).

Table 43: Marginal returns to level 3 NVQ qualifications – by age of acquisition

Comparison	Level 2			No Qualifications		
	All	Males	Females	All	Males	Females
15-16	0.011 (0.030)	-0.009 (0.038)	0.026 (0.046)	0.235*** (0.074)	0.371*** (0.025)	0.130 (0.106)
17-18	0.087*** (0.011)	0.087*** (0.016)	0.065*** (0.014)	0.181*** (0.046)	0.194*** (0.062)	0.142** (0.062)
19-20	0.105*** (0.011)	0.140*** (0.015)	0.047*** (0.015)	0.293*** (0.051)	0.345*** (0.060)	0.186** (0.094)
21-25	0.104*** (0.012)	0.164*** (0.018)	0.032* (0.016)	0.319*** (0.088)	0.384*** (0.119)	0.201 (0.132)
26-30	0.061*** (0.016)	0.095*** (0.023)	0.014 (0.022)	0.244*** (0.057)	0.266*** (0.072)	0.175** (0.086)
>30	-0.008 (0.007)	0.008 (0.013)	-0.007 (0.009)	0.081*** (0.018)	0.090*** (0.035)	0.078*** (0.021)

Note: Aggregated marginal returns to vocational qualifications – pooled Labour Force Survey data 2001-2009

Level 2: level 2 vocational and/or level 2 academic qualifications as a maximum. * 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance. Grey shaded cells indicate that the difference with the baseline (age group 17-18) is significant at 5% level.

Source: London Economics

3.8.2 Level 2 qualifications

Summary statistics of age of acquisition by qualification type

In Table 45, before considering the returns to level 2 qualifications, we have presented some analysis illustrating the average age of acquisition of different qualification types. This analysis is undertaken at level 2 only as the sample sizes are significantly larger than at other levels of qualification although the results are generally applicable at levels 1 and 3. The most striking feature is that NVQs are acquired by individuals much later in life compared to the other vocational qualifications that are acquired predominantly by younger individuals. In particular, the average age of acquisition of a NVQ level 2 stands at 29.3 (28.3 for men and 29.9 for women), which compares to an average age of acquisition of 21.8 for RSA level 2 qualifications, 22.0 for City & Guilds level 2 qualifications and 21.1 for BTEC level 2 qualifications. NVQs are by far the most widely taken qualifications, especially for adults and in many ways they cater better for adults, because they can be adapted for those already skilled in some areas. These qualifications are also a central part of the apprenticeship programme. In this sense, comparing them so directly to other qualifications (and implying that it is easy for adults to switch between them) may be misleading and should be noted throughout the analysis on earnings and employment returns.

Table 44: Distribution of age of acquisition for level 2 qualifications

	RSA level 2			C&G level 2			BTEC level 2			NVQ level 2		
	All	Male	Female	All	Male	Female	All	Male	Female	All	Male	Female
15-16	22.3%	37.1%	20.4%	5%	4.5%	7%	10.1%	10.7%	9.6%	5.3%	5.8%	5%
17-18	39.7%	17.1%	42.5%	31%	27.8%	44%	53.9%	50.6%	56.4%	24.7%	26.4%	23.7%
19-20	8.7%	8.6%	8.7%	30.2%	33.7%	16.2%	11.4%	14.6%	9%	9.6%	11.7%	8.4%
21-25	5.8%	8.6%	5.5%	17.6%	20.2%	7.2%	8.6%	9.6%	7.8%	10.6%	10.9%	10.4%
26-30	7.1%	11.4%	6.5%	4.2%	4.1%	4.4%	3.9%	2.7%	4.8%	8.6%	8.8%	8.4%
>30	16.5%	17.1%	16.4%	12%	9.7%	21.2%	12.2%	11.9%	12.5%	41.3%	36.3%	44%
Average	21.8	22.2	21.8	22.0	21.6	23.6	21.1	21.0	21.1	29.3	28.3	29.9

Note: Pooled Labour Force Survey data 2001-2009

Source: *London Economics*

In Table 45 overleaf, we replicate the previous analysis for those in possession of City & Guilds qualifications at level 2. The analysis again illustrates that for men in possession of these qualifications, there is statistically significant marginal earnings premium if the qualification is obtained earlier in life compared to possession of level 1 qualifications (the premium ranges from 6.6% to 12.4% ($\beta=0.064$ and 0.117)), although the late attainment of qualifications continues to provide a strong return. Interestingly, women who obtain their City & Guilds qualification slightly later in life (between the ages of 21 and 30) post a premium of up to 24.1% compared to women in possession of level 1 qualifications ($\beta=0.216$).

Table 45: Marginal returns to level 2 City & Guilds qualifications – by age of acquisition

Comparison	Level 1			No Qualifications		
	All	Males	Females	All	Males	Females
15-16	0.029 (0.029)	0.050 (0.032)	-0.140*** (0.043)	-	-	-
17-18	0.051*** (0.016)	0.064*** (0.018)	-0.026 (0.037)	-	-	-
19-20	0.116*** (0.015)	0.117*** (0.016)	-0.030 (0.050)	-	-	-
21-25	0.105*** (0.019)	0.095*** (0.020)	0.160* (0.087)	-	-	-
26-30	0.083** (0.033)	0.049 (0.036)	0.216*** (0.081)	-	-	-
>30	0.055** (0.022)	0.059** (0.026)	0.006 (0.040)	-	-	-

Note: Aggregated marginal returns to vocational qualifications – pooled Labour Force Survey data 2001-2009

Level 1: level 1 vocational and/or level 1 academic qualifications as a maximum. * 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance. Grey shaded cells indicate that the difference with the baseline (age group 17-18) is significant at 5% level.

Source: *London Economics*

As with City & Guilds qualifications, for BTEC qualifications at level 2 there is only a very slight impact of age of qualification acquisition on the returns associated with the qualification (presented in Table 46), though in many cases the returns are statistically insignificantly different from zero.

Table 46: Marginal returns to level 2 BTEC qualifications – by age of acquisition

Comparison	Level 1			No Qualifications		
	All	Males	Females	All	Males	Females
15-16	-0.124 (0.081)	-0.187 (0.117)	-0.065 (0.092)	-	-	-
17-18	0.063* (0.034)	0.085 (0.053)	0.039 (0.042)	-	-	-
19-20	0.022 (0.063)	0.070 (0.091)	-0.096** (0.039)	-	-	-
21-25	0.095 (0.084)	0.021 (0.094)	0.162 (0.148)	-	-	-
26-30	0.156* (0.088)	-0.016 (0.165)	0.207*** (0.068)	-	-	-
>30	0.004 (0.075)	-0.010 (0.086)	0.030 (0.145)	-	-	-

Note: Aggregated marginal returns to vocational qualifications – pooled Labour Force Survey data 2001-2009. Level 1: level 1 vocational and/or level 1 academic qualifications as a maximum. * 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance. Grey shaded cells indicate that the difference with the baseline (age group 17-18) is significant at 5% level.

Source: *London Economics*

Men obtaining BTEC level 2 qualifications between the ages of 17 and 18 achieve an 8.9% ($\beta=0.085$) earnings premium over those with level 1 qualifications, while women who obtain this qualification between the ages of 26 and 30 achieve a 23.0% return ($\beta=0.207$). However, the fact that some coefficients are negative (returns to BTEC level 2 qualifications acquired between the ages of 19 and 20) and many are statistically insignificant reiterates the fact that the sample sizes

associated with this element of the analysis are relatively small and some care should be taken with these findings.

Finally in this section, we consider the returns associated with NVQ level 2 qualifications (in Table 47). The results indicate that individuals, either male or female, who obtain NVQ level 2 qualifications later in life, earn (generally) between 6% and 7% less than those in possession of level 1 qualifications. In particular, men who obtain NVQ level 2 qualifications beyond the age of 30 post a negative return of 6.9% ($\beta=-0.072$), while women acquiring a qualification beyond the age of 26 post a negative return of approximately 4.8% ($\beta=-0.049$) compared to level 1 qualification attainment, although this again depends on the assumption that we have controlled for all unobservable characteristics.

Table 47: Marginal returns to level 2 NVQ qualifications – by age of acquisition

Comparison	Level 1			No Qualifications		
	All	Males	Females	All	Males	Females
15-16	0.010 (0.023)	-0.014 (0.033)	0.012 (0.032)	-	-	-
17-18	0.039*** (0.012)	0.040** (0.016)	0.005 (0.017)	-	-	-
19-20	0.037** (0.018)	0.024 (0.023)	0.030 (0.029)	-	-	-
21-25	0.068*** (0.017)	0.058*** (0.022)	0.060** (0.026)	-	-	-
26-30	-0.003 (0.019)	0.029 (0.023)	-0.056* (0.031)	-	-	-
>30	-0.060*** (0.008)	-0.072*** (0.013)	-0.049*** (0.010)	-	-	-

Note: Aggregated marginal returns to vocational qualifications – pooled Labour Force Survey data 2001-2009

level 1: level 1 vocational and/or level 1 academic qualifications as a maximum. No Qual: No formally recognised qualifications

* 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance. Grey shaded cells indicate that the difference with the baseline (age group 17-18) is significant at 5% level.

Source: *London Economics*

3.8.3 Level 1 qualifications

In Table 48, we present information relating to NVQ level 1 qualifications. There is some ambiguity in relation to the results, with no consistent relationship between the age of qualification attainment and the earnings associated with that qualification. Relative to possession of no formally recognised qualifications, men acquiring NVQ level 1 qualifications post a negative return of 8.3% if acquired between the ages of 17 and 18 ($\beta=-0.087$), but register a pay premium of 16.9% if attained between the ages of 19 and 20 ($\beta=0.156$). Clearly, given the volatility of the results being presented, some care needs to be taken when considering these estimated. City & Guilds qualifications appear to make more sense with men posting large and significant earnings returns to level 1 qualifications when acquired between the ages of 17 and 25, with those earnings premiums trailing off beyond age 25.

Table 48: Marginal Returns to level 1 City & Guilds and NVQ qualifications – by age of acquisition

Comparison	C&G level 1 versus no qualifications			NVQ level 1 versus no qualifications		
	All	Males	Females	All	Males	Females
15-16	0.014 (0.052)	0.057 (0.055)	-0.314** (0.136)	0.013 (0.093)	0.112 (0.093)	-0.380* (0.220)
17-18	0.089** (0.035)	0.093** (0.037)	0.047 (0.106)	-0.078** (0.040)	-0.087** (0.038)	-0.094 (0.090)
19-20	0.147*** (0.041)	0.149*** (0.043)	0.064 (0.107)	0.101 (0.073)	0.156* (0.083)	0.008 (0.133)
21-25	0.087** (0.038)	0.093** (0.040)	-0.143*** (0.046)	0.039 (0.047)	0.003 (0.049)	0.125 (0.100)
26-30	0.116* (0.066)	0.113 (0.078)	0.154* (0.082)	-0.004 (0.055)	0.006 (0.070)	-0.059 (0.079)
>30	0.018 (0.035)	0.032 (0.048)	-0.031 (0.042)	-0.024 (0.019)	-0.005 (0.030)	-0.046** (0.022)

Note: Aggregated marginal returns to vocational qualifications – pooled Labour Force Survey data 2001-2009

No Qual: No formally recognised qualifications

* 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance. Grey shaded cells indicate that the difference with the baseline (age group 17-18) is significant at 5% level.

Source: *London Economics*

4 Average earnings returns to vocational qualifications

4.1 Average earnings returns over time

In this section, we consider the average returns to qualification attainment. Unlike the previous section where we considered the marginal return (i.e. the impact of qualifications on earnings where we consider the highest qualification the individual is in possession of), in this section we estimate the average return to qualification attainment where we use information on every qualification the individual is in possession of. We present the information on average returns to intermediate and low level academic and vocational qualifications overleaf in Table 49 (men and women combined), with the disaggregated information relating to males presented in Table 50 and females in Table 51. The estimates are presented for individual years of the Labour Force Survey between 1996 and 2009; however, we also provide a pooled estimate covering all the years in the final column of each of the tables.

It is important to note that the earnings premiums relating to average returns are generally lower than when the marginal returns are estimated. When we consider average returns, we are estimating the returns to low level vocational qualifications for those with no other formally recognised qualifications (say) and those individuals with higher level or equivalent qualifications (e.g. an NVQ level 3 or 5 or more GCSEs at grades A*-C) who have also gained the particular qualification. Although not precisely the case, the marginal return is more similar to the consideration of the first category of individuals in possession of low pre-existing qualifications rather than the second.

The first point to note is that the estimates of the average returns are relatively stable over time. For instance, the average return to City & Guilds qualifications stands at between 8% and 13% for a level 3 qualification compared to a comparable individual not in possession of that qualification. The average return has increased gradually over the period and stands at 11.1% ($\beta=0.105$) compared to a marginal return of 24.6% ($\beta=0.220$) relative to individuals in possession of no qualifications or 14.5% ($\beta=0.136$) compared to an individual with either level 2 vocational qualifications or level 1 vocational qualifications as a maximum (see Table 7). The estimate of the average return to City & Guilds qualifications at level 2 is approximately 4.4% over the period ($\beta=0.042$), while the earnings premium associated with a City & Guilds level 1 qualification is statistically insignificantly different from zero overall. Interestingly, although the average return to City & Guilds level 2 qualifications is approximately 4.4%, the premium only exists in the earlier years and has essentially disappeared since 2007. These estimates are approximately 4 percentage points (level 2) to 7 percentage points (level 3) higher than the equivalent estimates presented by Jenkins et al (2007).

In terms of BTEC level 3 qualifications, the analysis illustrates that for men and women combined, there is an average return of approximately 13.8% over the period associated with these qualifications ($\beta=0.129$), though there appears to have been some erosion of the premium since 1996. In particular, between 1996 and 2000, the average returns to a BTEC level 3 qualification stood at between 12.6% and 16.9% ($\beta=0.119$ and 0.156), while between 2006 and 2009, the average return had dipped to between 11.9% and 12.9% ($\beta=0.112$ and 0.121). In addition to the average returns associated with level 3 qualifications, the analysis illustrates that there is a return of between 4% and 5% associated with the attainment of BTEC qualifications at either level 1 or level 2 (similar to the estimates provided by Jenkins *et al* (2007)). Interestingly, there appears to be a slightly stronger return to these vocational qualifications amongst males, with those in possession of level 3 BTEC qualifications posting an earnings premium of approximately 14.9% ($\beta=0.139$) compared to a premium of approximately 9.8% achieved by women ($\beta=0.093$).

We also assessed the returns to National Vocational Qualifications and found that there were positive returns of 4.7% on average over the period to NVQ level 3 qualifications ($\beta=0.045$) and that this average return had increased marginally over the period in question. These returns were marginally higher for men than for women (standing at approximately 6.8% ($\beta=0.065$) compared to 2.1% for women ($\beta=0.021$)). The analysis also illustrated that the returns to NVQ level 1 and NVQ level 2 qualifications were negative (standing at between -4.5% and -6.2% over the period ($\beta=-0.046$ and -0.062)), although it is important to realise that this apparent negative return has if anything fallen over time. In particular, individuals in possession of NVQ level 1 and NVQ level 2 qualifications suffered an average negative return of approximately 8-9% in 1996 ($\beta=-0.087$ and -0.089) compared to less than 5% currently. This compares to a statistically insignificant marginal return compared with no formally recognised qualifications associated with NVQ level 1 and 2 qualifications (illustrated in Table 9 and Table 10).

The headline results in relation to the negative average returns are broadly comparable to those generated by Jenkins *et al* (2007) and Dearden *et al* (2004). In particular, using the LFS between 1996 and 2002, Dearden *et al* (2004) demonstrate an average return of approximately 2.6% for a NVQ level 3, an average return of -9.7% for NVQ level 2 qualifications and a -12.2% for men in possession of NVQ level 1 qualifications. Jenkins *et al* (2007) demonstrate an average return of approximately 1.4% for a NVQ level 3, an average return of -5.8% for NVQ level 2 qualifications and a -5.8% return for men in possession of NVQ level 1 qualifications. As presented in Table 50, our analysis (for 2002) demonstrates returns of 3.5%, -4.4% and -4.5% for NVQ level 3, level 2 and level 1 qualifications respectively ($\beta=-0.034$, -0.045 and -0.047).

Table 49: Average returns to academic and vocational qualifications – all

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Pooled
1+ A level	0.040* (0.022)	0.091*** (0.018)	0.075*** (0.018)	0.085*** (0.017)	0.125*** (0.018)	0.095*** (0.020)	0.074*** (0.021)	0.062*** (0.018)	0.099*** (0.021)	0.100*** (0.022)	0.070*** (0.020)	0.082*** (0.019)	0.126*** (0.020)	0.115*** (0.021)	0.090*** (0.005)
1+ AS level	-0.032 (0.068)	-0.028 (0.074)	0.015 (0.055)	0.018 (0.069)	-0.010 (0.068)	0.029 (0.084)	-0.032 (0.065)	-0.026 (0.056)	-0.150*** (0.051)	-0.008 (0.055)	-0.008 (0.039)	0.017 (0.043)	0.083* (0.042)	0.025 (0.031)	0.004 (0.014)
5+ GCSEs A*-C	0.250*** (0.011)	0.252*** (0.010)	0.242*** (0.009)	0.251*** (0.009)	0.223*** (0.010)	0.217*** (0.011)	0.213*** (0.011)	0.204*** (0.010)	0.215*** (0.012)	0.212*** (0.012)	0.199*** (0.011)	0.208*** (0.010)	0.203*** (0.010)	0.191*** (0.011)	0.220*** (0.003)
4- GCSEs A*-C	0.142*** (0.009)	0.154*** (0.009)	0.152*** (0.008)	0.151*** (0.009)	0.129*** (0.009)	0.127*** (0.010)	0.124*** (0.011)	0.117*** (0.009)	0.118*** (0.010)	0.121*** (0.011)	0.110*** (0.010)	0.109*** (0.009)	0.126*** (0.010)	0.094*** (0.010)	0.127*** (0.003)
1+ GCSEs D-G	0.071*** (0.014)	0.094*** (0.011)	0.075*** (0.010)	0.065*** (0.011)	0.031*** (0.011)	0.024* (0.013)	0.025* (0.013)	0.039*** (0.011)	0.045*** (0.015)	0.048*** (0.015)	0.039*** (0.013)	0.048*** (0.013)	0.037*** (0.013)	0.014 (0.013)	0.046*** (0.003)
RSA level 3	0.033 (0.065)	0.120** (0.052)	0.149*** (0.035)	0.115** (0.049)	0.107 (0.071)	-0.006 (0.060)	0.091* (0.055)	0.023 (0.066)	0.119 (0.091)	0.122* (0.071)	0.041 (0.101)	-0.010 (0.059)	0.110 (0.086)	0.033 (0.069)	0.081*** (0.017)
RSA level 2	0.078 (0.052)	0.041 (0.046)	0.143*** (0.046)	0.049 (0.069)	0.115* (0.059)	0.012 (0.055)	0.172*** (0.054)	0.035 (0.055)	0.081 (0.072)	0.050 (0.091)	-0.012 (0.069)	0.189*** (0.055)	-0.043 (0.046)	0.025 (0.067)	0.067*** (0.016)
RSA level 1	0.072*** (0.012)	0.045*** (0.012)	0.038*** (0.011)	0.030** (0.012)	0.040*** (0.011)	0.012 (0.013)	0.024* (0.014)	0.020 (0.013)	0.027* (0.015)	-0.001 (0.017)	0.022 (0.015)	0.031* (0.017)	0.003 (0.015)	0.011 (0.016)	0.030*** (0.004)
C&G level 3	0.093*** (0.017)	0.111*** (0.014)	0.123*** (0.012)	0.092*** (0.013)	0.086*** (0.014)	0.097*** (0.014)	0.086*** (0.015)	0.112*** (0.014)	0.101*** (0.015)	0.099*** (0.016)	0.109*** (0.015)	0.121*** (0.015)	0.134*** (0.016)	0.117*** (0.017)	0.105*** (0.004)
C&G level 2	0.066*** (0.013)	0.050*** (0.012)	0.037*** (0.012)	0.030** (0.014)	0.020 (0.014)	0.050*** (0.017)	0.043*** (0.016)	0.013 (0.015)	0.046** (0.019)	0.038* (0.019)	0.077*** (0.017)	0.028 (0.019)	0.029 (0.019)	0.026 (0.018)	0.042*** (0.004)
C&G level 1	0.039*** (0.014)	0.002 (0.016)	-0.004 (0.017)	0.016 (0.018)	-0.039** (0.019)	-0.035 (0.021)	-0.001 (0.021)	-0.012 (0.018)	-0.005 (0.023)	-0.040 (0.025)	-0.065*** (0.025)	-0.039 (0.024)	-0.008 (0.022)	-0.028 (0.029)	-0.009 (0.005)
BTEC level 3	0.134*** (0.017)	0.156*** (0.016)	0.119*** (0.014)	0.128*** (0.015)	0.165*** (0.017)	0.141*** (0.018)	0.128*** (0.018)	0.155*** (0.016)	0.112*** (0.019)	0.091*** (0.020)	0.121*** (0.019)	0.123*** (0.020)	0.118*** (0.019)	0.112*** (0.020)	0.129*** (0.005)
BTEC level 2	0.150*** (0.037)	0.061 (0.039)	0.095*** (0.032)	0.071* (0.039)	0.063* (0.038)	0.097** (0.046)	0.064 (0.049)	0.091** (0.045)	0.078* (0.046)	-0.009 (0.046)	-0.020 (0.039)	0.036 (0.041)	-0.036 (0.032)	-0.032 (0.035)	0.043*** (0.011)
BTEC level 1	0.035 (0.033)	0.085** (0.038)	0.064* (0.038)	0.101*** (0.032)	0.034 (0.039)	0.081** (0.040)	0.049 (0.052)	-0.004 (0.043)	0.021 (0.054)	-0.023 (0.043)	0.052 (0.054)	0.071 (0.050)	0.013 (0.041)	-0.013 (0.040)	0.041*** (0.011)
NVQ level 3	0.013 (0.028)	0.022 (0.022)	0.046** (0.019)	0.051*** (0.017)	0.041*** (0.014)	0.037** (0.016)	0.034** (0.015)	0.036*** (0.013)	0.029* (0.015)	0.032** (0.014)	0.039*** (0.012)	0.066*** (0.012)	0.068*** (0.011)	0.057*** (0.012)	0.045*** (0.004)
NVQ level 2	-0.084*** (0.018)	-0.048*** (0.017)	-0.057*** (0.015)	-0.045*** (0.014)	-0.056*** (0.013)	-0.053*** (0.013)	-0.045*** (0.014)	-0.059*** (0.012)	-0.035*** (0.013)	-0.065*** (0.014)	-0.070*** (0.012)	-0.044*** (0.010)	-0.058*** (0.010)	-0.047*** (0.011)	-0.052*** (0.003)

Table 49: Average returns to academic and vocational qualifications – all

NVQ level 1	-0.089** (0.036)	-0.114*** (0.029)	-0.075*** (0.025)	-0.079*** (0.024)	-0.070*** (0.023)	-0.059** (0.025)	-0.047** (0.023)	-0.071*** (0.019)	-0.113*** (0.023)	-0.084*** (0.029)	-0.070*** (0.021)	-0.069*** (0.017)	-0.035** (0.014)	-0.036** (0.015)	-0.062*** (0.006)
Trade App	0.045 (0.031)	0.057** (0.024)	0.057** (0.024)	0.090*** (0.026)	0.030 (0.026)	0.095*** (0.029)	0.021 (0.030)	0.039 (0.032)	0.135*** (0.031)	0.104*** (0.038)	0.100*** (0.032)	0.083 (0.083)	0.124*** (0.044)	0.119*** (0.044)	0.067*** (0.008)
Other	0.060*** (0.007)	0.072*** (0.007)	0.072*** (0.006)	0.075*** (0.006)	0.078*** (0.007)	0.085*** (0.008)	0.065*** (0.008)	0.065*** (0.007)	0.080*** (0.008)	0.068*** (0.009)	0.069*** (0.008)	0.069*** (0.008)	0.066*** (0.008)	0.076*** (0.008)	0.073*** (0.002)
Voc (L D/K)	0.030* (0.016)	0.038*** (0.012)	0.050*** (0.011)	0.058*** (0.011)	0.035*** (0.011)	0.048*** (0.013)	0.060*** (0.013)	0.060*** (0.012)	0.072*** (0.016)	0.061*** (0.014)	0.054*** (0.012)	0.052*** (0.012)	0.033** (0.013)	0.016 (0.014)	0.047*** (0.003)
N	12,494	15,738	16,915	15,307	14,193	11,109	10,833	13,658	9,746	8,722	11,871	12,560	12,329	10,731	176,206
R2	0.326	0.342	0.340	0.333	0.320	0.307	0.293	0.301	0.298	0.290	0.284	0.270	0.274	0.276	0.310

Note: Aggregated average returns to vocational qualifications – pooled Labour Force Survey data 1996-2009

* 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance. Grey shaded cells indicate that the difference with the pooled coefficient is significant at 5% level

Source: London Economics

Table 50: Average returns to academic and vocational qualifications – males

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Pooled
1+ A level	0.067* (0.035)	0.122*** (0.028)	0.068*** (0.026)	0.113*** (0.026)	0.097*** (0.025)	0.123*** (0.029)	0.043 (0.030)	0.026 (0.026)	0.126*** (0.030)	0.105*** (0.031)	0.074*** (0.027)	0.058** (0.028)	0.108*** (0.030)	0.132*** (0.031)	0.091*** (0.008)
1+ AS level	-0.011 (0.086)	-0.043 (0.158)	0.062 (0.082)	0.015 (0.108)	0.062 (0.091)	0.061 (0.083)	0.042 (0.108)	-0.073 (0.064)	-0.131** (0.056)	-0.021 (0.099)	-0.016 (0.055)	-0.016 (0.067)	0.059 (0.078)	0.024 (0.047)	0.000 (0.021)
5+ GCSEs A*-C	0.274*** (0.015)	0.244*** (0.014)	0.237*** (0.013)	0.249*** (0.012)	0.241*** (0.014)	0.211*** (0.015)	0.226*** (0.015)	0.218*** (0.013)	0.227*** (0.017)	0.204*** (0.016)	0.206*** (0.014)	0.227*** (0.014)	0.210*** (0.014)	0.204*** (0.015)	0.227*** (0.004)
4- GCSEs A*-C	0.142*** (0.012)	0.151*** (0.011)	0.155*** (0.011)	0.158*** (0.011)	0.144*** (0.012)	0.137*** (0.013)	0.140*** (0.014)	0.115*** (0.012)	0.121*** (0.013)	0.121*** (0.014)	0.109*** (0.012)	0.119*** (0.012)	0.120*** (0.013)	0.109*** (0.013)	0.131*** (0.003)
1+ GCSEs D-G	0.078*** (0.017)	0.090*** (0.014)	0.076*** (0.013)	0.079*** (0.013)	0.047*** (0.014)	0.033** (0.016)	0.047*** (0.016)	0.058*** (0.014)	0.048*** (0.018)	0.068*** (0.018)	0.045*** (0.016)	0.062*** (0.016)	0.040** (0.017)	0.025 (0.017)	0.056*** (0.004)
RSA level 3	-0.128 (0.229)	0.060 (0.125)	0.141* (0.077)	0.053 (0.120)	0.078 (0.274)	-0.132 (0.170)	-0.091 (0.165)	-0.158* (0.089)	-0.063 (0.153)	0.269*** (0.045)	-0.053** (0.022)	-0.243*** (0.041)	-0.014 (0.089)	0.369*** (0.088)	0.004 (0.046)
RSA level 2	-0.232* (0.126)	-0.020 (0.054)	-0.013 (0.111)	-0.037 (0.174)	0.160 (0.127)	0.068 (0.114)	0.111 (0.083)	0.074 (0.138)	0.000 (0.000)	-0.096 (0.079)	-0.209 (0.128)	-0.045 (0.139)	0.010 (0.108)	-0.384*** (0.139)	-0.021 (0.038)
RSA level 1	-0.045 (0.034)	-0.083** (0.038)	-0.047 (0.033)	-0.046 (0.037)	0.002 (0.033)	-0.079** (0.031)	-0.027 (0.036)	-0.014 (0.046)	-0.045 (0.038)	-0.003 (0.050)	0.017 (0.054)	0.109 (0.084)	-0.087 (0.062)	-0.062 (0.047)	-0.035*** (0.011)
C&G level 3	0.104*** (0.018)	0.118*** (0.014)	0.120*** (0.013)	0.084*** (0.014)	0.085*** (0.014)	0.092*** (0.015)	0.094*** (0.015)	0.115*** (0.014)	0.100*** (0.017)	0.093*** (0.017)	0.104*** (0.016)	0.123*** (0.015)	0.141*** (0.016)	0.107*** (0.018)	0.105*** (0.004)
C&G level 2	0.076*** (0.013)	0.062*** (0.013)	0.041*** (0.013)	0.028* (0.016)	0.023 (0.015)	0.059*** (0.019)	0.047*** (0.018)	0.011 (0.016)	0.057*** (0.021)	0.049** (0.022)	0.082*** (0.019)	0.040* (0.021)	0.024 (0.022)	0.032 (0.020)	0.047*** (0.004)
C&G level 1	0.077*** (0.017)	0.018 (0.019)	0.008 (0.021)	0.012 (0.021)	-0.031 (0.023)	-0.011 (0.027)	0.021 (0.025)	-0.012 (0.022)	0.018 (0.029)	-0.052* (0.030)	-0.062** (0.030)	-0.023 (0.029)	0.002 (0.026)	-0.052 (0.037)	0.004 (0.006)
BTEC level 3	0.136*** (0.021)	0.184*** (0.018)	0.121*** (0.018)	0.138*** (0.017)	0.182*** (0.022)	0.170*** (0.022)	0.138*** (0.024)	0.172*** (0.021)	0.124*** (0.024)	0.089*** (0.025)	0.122*** (0.023)	0.114*** (0.025)	0.128*** (0.025)	0.118*** (0.027)	0.139*** (0.006)
BTEC level 2	0.144*** (0.049)	0.104 (0.069)	0.063 (0.051)	0.070 (0.063)	0.067 (0.051)	0.141** (0.067)	0.060 (0.069)	0.038 (0.065)	0.041 (0.060)	-0.086** (0.043)	-0.038 (0.054)	0.058 (0.051)	-0.066 (0.046)	-0.014 (0.051)	0.032** (0.015)
BTEC level 1	0.069 (0.046)	0.076 (0.052)	0.137*** (0.049)	0.096** (0.042)	0.008 (0.048)	0.120** (0.052)	0.042 (0.051)	-0.060 (0.060)	0.101** (0.047)	-0.060 (0.059)	0.039 (0.075)	0.061 (0.061)	0.035 (0.055)	-0.062 (0.058)	0.047*** (0.015)
NVQ level 3	-0.007 (0.037)	0.009 (0.030)	0.086*** (0.031)	0.060** (0.024)	0.048** (0.020)	0.040* (0.023)	0.045* (0.023)	0.079*** (0.019)	0.052** (0.023)	0.060*** (0.022)	0.062*** (0.018)	0.083*** (0.017)	0.089*** (0.017)	0.094*** (0.018)	0.065*** (0.006)
NVQ level 2	-0.077*** (0.026)	-0.043* (0.023)	-0.060** (0.024)	-0.043** (0.019)	-0.084*** (0.018)	-0.066*** (0.020)	-0.046** (0.019)	-0.043** (0.018)	-0.020 (0.019)	-0.066*** (0.020)	-0.054*** (0.016)	-0.031** (0.015)	-0.038** (0.015)	-0.037** (0.016)	-0.046*** (0.005)

Table 50: Average returns to academic and vocational qualifications – males

NVQ level 1	-0.105** (0.047)	-0.115*** (0.039)	-0.082** (0.037)	-0.093*** (0.035)	-0.069** (0.030)	-0.016 (0.034)	-0.066** (0.030)	-0.048* (0.027)	-0.095*** (0.032)	-0.085** (0.042)	-0.086*** (0.029)	-0.074*** (0.023)	-0.055*** (0.019)	-0.042* (0.022)	-0.061*** (0.008)
Trade App	0.050 (0.034)	0.049* (0.026)	0.044* (0.026)	0.087*** (0.029)	0.031 (0.028)	0.103*** (0.032)	0.032 (0.032)	0.039 (0.035)	0.123*** (0.032)	0.103*** (0.040)	0.097*** (0.034)	0.065 (0.092)	0.115** (0.045)	0.103** (0.046)	0.064*** (0.009)
Other	0.057*** (0.009)	0.062*** (0.008)	0.055*** (0.008)	0.068*** (0.008)	0.078*** (0.009)	0.093*** (0.010)	0.055*** (0.010)	0.055*** (0.009)	0.074*** (0.011)	0.069*** (0.011)	0.062*** (0.010)	0.060*** (0.010)	0.060*** (0.010)	0.071*** (0.010)	0.066*** (0.002)
Voc (L D/K)	0.038** (0.019)	0.047*** (0.014)	0.048*** (0.013)	0.060*** (0.013)	0.038*** (0.014)	0.052*** (0.016)	0.076*** (0.015)	0.068*** (0.015)	0.088*** (0.019)	0.064*** (0.017)	0.070*** (0.015)	0.067*** (0.015)	0.028* (0.017)	0.022 (0.016)	0.054*** (0.004)
N	8,031	10,133	10,812	9,859	9,078	7,011	6,853	8,638	6,239	5,503	7,481	7,956	7,774	6,762	112,130
R2	0.313	0.331	0.317	0.320	0.300	0.289	0.273	0.286	0.290	0.271	0.277	0.261	0.251	0.252	0.291

Note: Aggregated average returns to vocational qualifications – pooled Labour Force Survey data 1996-2009

* 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance. Grey shaded cells indicate that the difference with the pooled coefficient is significant at 5% level

Source: London Economics

Table 51: Average returns to academic and vocational qualifications – females

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Pooled
1+ A level	0.009 (0.027)	0.056** (0.024)	0.079*** (0.023)	0.054** (0.022)	0.149*** (0.024)	0.073*** (0.025)	0.107*** (0.029)	0.099*** (0.022)	0.076*** (0.028)	0.100*** (0.033)	0.063** (0.029)	0.111*** (0.026)	0.144*** (0.026)	0.106*** (0.028)	0.090*** (0.007)
1+ AS level	-0.006 (0.095)	-0.045 (0.084)	-0.062 (0.060)	0.029 (0.085)	-0.064 (0.095)	-0.012 (0.124)	-0.086 (0.087)	0.042 (0.092)	-0.184* (0.102)	-0.014 (0.060)	0.011 (0.052)	0.011 (0.055)	0.098** (0.039)	0.016 (0.037)	-0.003 (0.018)
5+ GCSEs A*-C	0.208*** (0.017)	0.257*** (0.015)	0.243*** (0.014)	0.238*** (0.015)	0.184*** (0.015)	0.203*** (0.017)	0.185*** (0.017)	0.178*** (0.015)	0.198*** (0.017)	0.220*** (0.019)	0.183*** (0.016)	0.175*** (0.015)	0.196*** (0.015)	0.167*** (0.016)	0.203*** (0.004)
4- GCSEs A*-C	0.138*** (0.015)	0.153*** (0.014)	0.150*** (0.013)	0.137*** (0.014)	0.098*** (0.014)	0.107*** (0.016)	0.091*** (0.016)	0.117*** (0.014)	0.109*** (0.016)	0.121*** (0.017)	0.110*** (0.015)	0.088*** (0.014)	0.137*** (0.014)	0.065*** (0.016)	0.117*** (0.004)
1+ GCSEs D-G	0.054** (0.023)	0.106*** (0.020)	0.081*** (0.018)	0.034* (0.019)	0.005 (0.019)	-0.000 (0.022)	-0.015 (0.022)	0.001 (0.019)	0.039 (0.027)	0.003 (0.027)	0.024 (0.021)	0.018 (0.023)	0.035* (0.020)	-0.002 (0.021)	0.029*** (0.006)
RSA level 3	0.058 (0.065)	0.142** (0.056)	0.166*** (0.043)	0.138*** (0.053)	0.128* (0.070)	0.027 (0.055)	0.132** (0.052)	0.057 (0.072)	0.153 (0.101)	0.130* (0.075)	0.081 (0.106)	0.068 (0.065)	0.121 (0.094)	-0.001 (0.072)	0.110*** (0.018)
RSA level 2	0.146*** (0.049)	0.060 (0.061)	0.174*** (0.048)	0.096 (0.071)	0.103* (0.062)	0.011 (0.060)	0.215*** (0.062)	0.035 (0.060)	0.084 (0.072)	0.121 (0.121)	0.042 (0.073)	0.221*** (0.057)	-0.050 (0.046)	0.078 (0.070)	0.097*** (0.017)
RSA level 1	0.092*** (0.013)	0.064*** (0.013)	0.058*** (0.011)	0.057*** (0.012)	0.064*** (0.012)	0.043*** (0.014)	0.046*** (0.015)	0.039*** (0.013)	0.061*** (0.016)	0.013 (0.019)	0.043*** (0.016)	0.044*** (0.017)	0.032** (0.016)	0.046*** (0.018)	0.054*** (0.004)
C&G level 3	-0.028 (0.048)	0.016 (0.044)	0.024 (0.048)	0.058 (0.041)	-0.009 (0.045)	0.054 (0.042)	-0.080 (0.049)	-0.017 (0.038)	-0.004 (0.042)	0.065 (0.047)	0.050 (0.046)	0.018 (0.059)	-0.048 (0.054)	0.085 (0.058)	0.007 (0.013)
C&G level 2	-0.037 (0.035)	-0.048 (0.032)	-0.023 (0.030)	-0.001 (0.035)	-0.044 (0.035)	-0.008 (0.040)	-0.013 (0.032)	-0.019 (0.039)	-0.021 (0.038)	-0.053 (0.039)	0.013 (0.034)	-0.077* (0.045)	0.006 (0.035)	-0.046 (0.039)	-0.027*** (0.010)
C&G level 1	-0.066*** (0.021)	-0.057* (0.030)	-0.037 (0.027)	0.037 (0.033)	-0.058* (0.032)	-0.092*** (0.032)	-0.037 (0.039)	-0.007 (0.031)	-0.048 (0.033)	-0.017 (0.041)	-0.079* (0.046)	-0.094*** (0.034)	-0.035 (0.042)	0.026 (0.046)	-0.045*** (0.009)
BTEC level 3	0.110*** (0.031)	0.066** (0.029)	0.099*** (0.021)	0.091*** (0.028)	0.105*** (0.026)	0.079*** (0.028)	0.093*** (0.027)	0.109*** (0.024)	0.058* (0.031)	0.094*** (0.033)	0.105*** (0.034)	0.124*** (0.032)	0.092*** (0.029)	0.092*** (0.028)	0.093*** (0.008)
BTEC level 2	0.125** (0.054)	0.008 (0.040)	0.116*** (0.039)	0.073 (0.049)	0.028 (0.056)	0.028 (0.061)	0.062 (0.066)	0.109* (0.059)	0.098 (0.068)	0.122 (0.087)	-0.017 (0.059)	-0.006 (0.067)	0.007 (0.047)	-0.039 (0.041)	0.048*** (0.015)
BTEC level 1	-0.011 (0.048)	0.100** (0.050)	-0.045 (0.058)	0.100** (0.047)	0.063 (0.064)	0.040 (0.058)	0.033 (0.097)	0.048 (0.055)	-0.098 (0.110)	0.014 (0.061)	0.097* (0.057)	0.083 (0.086)	-0.014 (0.062)	0.028 (0.053)	0.030* (0.017)
NVQ level 3	0.048 (0.043)	0.026 (0.031)	0.001 (0.022)	0.035 (0.023)	0.032* (0.018)	0.026 (0.023)	0.026 (0.020)	-0.009 (0.019)	-0.003 (0.020)	-0.002 (0.019)	0.012 (0.015)	0.041** (0.016)	0.047*** (0.015)	0.029* (0.017)	0.021*** (0.005)
NVQ level 2	-0.085*** (0.023)	-0.056** (0.023)	-0.058*** (0.019)	-0.052*** (0.019)	-0.039** (0.018)	-0.051*** (0.017)	-0.042** (0.020)	-0.075*** (0.015)	-0.059*** (0.018)	-0.071*** (0.020)	-0.091*** (0.017)	-0.067*** (0.015)	-0.078*** (0.013)	-0.058*** (0.015)	-0.062*** (0.005)

Table 51: Average returns to academic and vocational qualifications – females

NVQ level 1	-0.052 (0.050)	-0.114*** (0.043)	-0.060** (0.030)	-0.072** (0.030)	-0.057* (0.033)	-0.116*** (0.037)	-0.017 (0.036)	-0.094*** (0.027)	-0.129*** (0.033)	-0.086** (0.040)	-0.046 (0.029)	-0.060** (0.025)	-0.016 (0.020)	-0.037* (0.021)	-0.061*** (0.008)
Trade App	0.003 (0.085)	0.002 (0.045)	-0.025 (0.059)	0.009 (0.058)	-0.116** (0.053)	-0.033 (0.075)	-0.114 (0.075)	-0.111 (0.081)	0.129 (0.090)	-0.011 (0.123)	0.012 (0.079)	0.213 (0.179)	0.327 (0.248)	0.154* (0.088)	-0.021 (0.022)
Other	0.051*** (0.012)	0.073*** (0.011)	0.082*** (0.010)	0.069*** (0.010)	0.069*** (0.011)	0.057*** (0.012)	0.074*** (0.012)	0.072*** (0.011)	0.082*** (0.013)	0.062*** (0.014)	0.076*** (0.012)	0.079*** (0.012)	0.068*** (0.012)	0.076*** (0.012)	0.072*** (0.003)
Voc (L D/K)	0.003 (0.026)	0.010 (0.022)	0.044** (0.019)	0.046** (0.020)	0.019 (0.020)	0.027 (0.023)	0.011 (0.023)	0.032 (0.021)	0.020 (0.024)	0.044* (0.024)	0.003 (0.020)	-0.010 (0.023)	0.032 (0.020)	-0.001 (0.027)	0.020*** (0.006)
N	4,463	5,605	6,103	5,448	5,115	4,098	3,980	5,020	3,507	3,219	4,390	4,604	4,555	3,969	64,076
R2	0.307	0.306	0.327	0.309	0.305	0.288	0.276	0.281	0.274	0.263	0.250	0.235	0.260	0.273	0.288

Note: Aggregated average returns to vocational qualifications – pooled Labour Force Survey data 1996-2009

* 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance. Grey shaded cells indicate that the difference with the pooled coefficient is significant at 5% level

Source: London Economics

4.2 Average earnings returns by sector

In Table 52, we provide some information on the returns by sector, further disaggregated by gender in Table 53 (males) and Table 54 (females). Compared to individuals without the particular qualification, the analysis illustrates that there are relatively strong positive returns posted by individuals across a range of sectors.

	Agriculture and Fishing	Energy and Water	Manufacturing	Construction	Distribution hotels and restaurants	Transport and Comms.	Banking, finance and insurance	Public Admin, education and health	Other
1+ A level	0.025 (0.076)	0.019 (0.045)	0.085*** (0.013)	0.077*** (0.023)	0.064*** (0.013)	0.067*** (0.019)	0.106*** (0.012)	0.069*** (0.008)	0.068** (0.031)
1+ AS level	0.114** (0.056)	0.008 (0.038)	0.015 (0.037)	-0.037 (0.066)	0.021 (0.030)	0.078 (0.055)	-0.040 (0.026)	-0.020 (0.023)	-0.101 (0.089)
5+ GCSEs A*-C	0.124*** (0.032)	0.126*** (0.021)	0.211*** (0.006)	0.139*** (0.011)	0.207*** (0.007)	0.220*** (0.009)	0.227*** (0.009)	0.174*** (0.005)	0.191*** (0.015)
4- GCSEs A*-C	0.080*** (0.023)	0.046** (0.020)	0.134*** (0.005)	0.083*** (0.009)	0.124*** (0.006)	0.131*** (0.008)	0.139*** (0.009)	0.097*** (0.005)	0.102*** (0.013)
1+ GCSEs A*-G	0.057** (0.025)	-0.009 (0.026)	0.076*** (0.006)	0.032*** (0.011)	0.054*** (0.007)	0.053*** (0.010)	0.017 (0.012)	0.016** (0.007)	0.040** (0.018)
RSA level 3	0.000 (0.000)	0.098 (0.092)	0.073* (0.037)	-0.014 (0.066)	0.003 (0.067)	0.117* (0.070)	0.057* (0.032)	0.062*** (0.023)	0.042 (0.090)
RSA level 2	0.000 (0.000)	0.021 (0.112)	0.177*** (0.038)	-0.118 (0.109)	0.048 (0.047)	-0.053 (0.059)	-0.023 (0.034)	0.045* (0.023)	0.160* (0.083)
RSA level 1	0.101** (0.041)	-0.001 (0.031)	0.041*** (0.008)	-0.055*** (0.020)	0.032*** (0.009)	0.008 (0.014)	-0.046*** (0.009)	0.018*** (0.005)	0.094*** (0.019)
C&G level 3	-0.019 (0.049)	0.114*** (0.023)	0.133*** (0.006)	0.101*** (0.010)	0.097*** (0.010)	0.109*** (0.014)	0.018 (0.017)	0.049*** (0.009)	0.082*** (0.024)
C&G level 2	0.022 (0.035)	0.100*** (0.025)	0.074*** (0.007)	0.076*** (0.012)	0.022** (0.009)	0.056*** (0.012)	-0.051*** (0.018)	0.006 (0.009)	-0.018 (0.024)
C&G level 1	-0.036 (0.054)	0.112** (0.046)	0.042*** (0.010)	0.015 (0.017)	-0.020* (0.012)	0.015 (0.016)	-0.120*** (0.019)	-0.016 (0.010)	-0.023 (0.026)
BTEC level 3	0.229*** (0.049)	0.171*** (0.029)	0.160*** (0.009)	0.125*** (0.019)	0.108*** (0.013)	0.151*** (0.017)	0.098*** (0.013)	0.075*** (0.008)	0.069** (0.027)
BTEC level 2	-0.102 (0.076)	0.122 (0.102)	0.070*** (0.020)	0.013 (0.054)	0.038 (0.023)	0.089** (0.036)	-0.015 (0.029)	0.027 (0.020)	0.113* (0.063)
BTEC level 1	0.082 (0.091)	-0.045 (0.070)	0.051** (0.022)	0.084* (0.046)	0.022 (0.029)	0.072** (0.033)	-0.030 (0.028)	0.049** (0.021)	0.056 (0.073)
NVQ level 3	-0.022 (0.046)	0.026 (0.023)	0.054*** (0.009)	0.127*** (0.014)	0.067*** (0.009)	0.035** (0.014)	0.011 (0.013)	0.022*** (0.006)	0.102*** (0.022)
NVQ level 2	-0.030 (0.038)	-0.026 (0.026)	-0.028*** (0.007)	0.007 (0.013)	-0.024*** (0.007)	-0.041*** (0.012)	-0.107*** (0.011)	-0.069*** (0.006)	-0.001 (0.016)
NVQ level 1	-0.074 (0.056)	0.017 (0.038)	-0.039*** (0.010)	-0.032 (0.020)	-0.053*** (0.011)	-0.067*** (0.018)	-0.098*** (0.018)	-0.075*** (0.011)	-0.063** (0.028)
Trade App	0.022 (0.059)	0.002 (0.060)	0.072*** (0.013)	0.073*** (0.022)	0.030 (0.021)	0.070*** (0.025)	0.046 (0.038)	-0.003 (0.022)	0.001 (0.043)
Other	0.045*** (0.017)	0.022 (0.015)	0.057*** (0.004)	0.082*** (0.007)	0.039*** (0.005)	0.057*** (0.006)	0.122*** (0.006)	0.090*** (0.004)	0.072*** (0.010)
Voc (L D/K)	0.021 (0.035)	0.025 (0.022)	0.072*** (0.007)	0.081*** (0.010)	0.047*** (0.008)	0.046*** (0.010)	-0.039*** (0.011)	0.029*** (0.007)	0.023 (0.018)
Obs.	2,022	2,739	44,046	14,101	32,663	17,303	21,828	33,712	7,654
R2	0.285	0.263	0.322	0.340	0.292	0.263	0.327	0.371	0.363

Note: Aggregated average returns to vocational qualifications – pooled Labour Force Survey data 1996-2009

* 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance.

Source: London Economics

In particular, for individuals in possession of City & Guilds qualifications (irrespective of the level), average returns of between 11.0% and 12.1% are achieved in the energy and water sectors ($\beta=0.10$ and 0.114), while a 14.3% average return is achieved by individuals in possession of a City & Guilds level 3 qualification in the manufacturing sector ($\beta=0.133$) and 11.2% in the transport and communication sector ($\beta=0.109$). The average returns associated with City & Guilds qualifications at level 2 are repeatedly demonstrated, standing at 7.6% in the manufacturing sector ($\beta=0.074$), 7.9% in the construction sector ($\beta=0.076$), 5.8% in the transport and communication sector ($\beta=0.056$). Given the nature and scope of these qualifications, only the banking, finance and insurance sectors appear to be associated with negative returns to City & Guilds level 2 qualifications.

In aggregate, BTEC level 3 qualifications post strong positive returns across the board, standing at in excess of 10% with the exception of the public administration, health and education sector. Although these returns exist for both men and women, they appear to be a little more variable for women.

There are strong positive returns to NVQ level 3 qualifications across some sectors of the economy although this is by no means uniform. In particular, individuals in possession of NVQ level 3 qualifications post return of up to 13.4% in the construction industry ($\beta=0.127$), though this return does not approach 10% in any other sector of the economy (apart from 'other'). It is interesting to note that the relatively poor returns to National Vocational Qualifications that are estimated in aggregate are highly concentrated in some specific sectors of the economy. In particular, individuals with NVQ level 2 qualifications post a negative return of 10.1% in the banking, finance and insurance sectors ($\beta=0.107$) and 6.7% in the public administration, health and education sectors ($\beta=0.069$). Equivalent results are illustrated in the case of those in possession of level 1 qualifications. Very similar results are presented for men in Table 53.

Table 53: Average returns to qualifications by sector – males

	Agriculture and Fishing	Energy and Water	Manufacturing	Construction	Distribution hotels and restaurants	Transport and Comms.	Banking, finance and insurance	Public Admin, education and health	Other
1+ A level	-0.022 (0.096)	0.035 (0.059)	0.069*** (0.017)	0.058** (0.026)	0.069*** (0.019)	0.053** (0.022)	0.114*** (0.018)	0.059*** (0.013)	0.018 (0.051)
1+ AS level	0.165** (0.066)	-0.040 (0.064)	0.007 (0.047)	-0.057 (0.072)	0.035 (0.043)	0.017 (0.087)	-0.087** (0.043)	0.033 (0.045)	0.049 (0.154)
5+ GCSEs A*-C	0.093** (0.036)	0.133*** (0.025)	0.199*** (0.007)	0.143*** (0.011)	0.222*** (0.009)	0.241*** (0.011)	0.287*** (0.014)	0.197*** (0.009)	0.193*** (0.022)
4- GCSEs A*-C	0.075*** (0.025)	0.061*** (0.023)	0.134*** (0.005)	0.086*** (0.010)	0.134*** (0.008)	0.131*** (0.008)	0.178*** (0.014)	0.115*** (0.009)	0.110*** (0.019)
1+ GCSEs A*-G	0.058** (0.026)	0.001 (0.029)	0.076*** (0.007)	0.041*** (0.012)	0.068*** (0.009)	0.063*** (0.010)	0.023 (0.019)	0.025* (0.013)	0.055** (0.024)
RSA level 3	0.000 (0.000)	0.274*** (0.058)	0.088 (0.071)	0.015 (0.190)	-0.018 (0.083)	-0.014 (0.062)	0.091 (0.164)	-0.018 (0.093)	-0.446*** (0.041)
RSA level 2	0.000 (0.000)	-0.081 (0.125)	0.113 (0.072)	-0.199 (0.161)	0.064 (0.060)	-0.200* (0.120)	-0.261*** (0.085)	0.096 (0.077)	-0.036 (0.050)
RSA level 1	0.122 (0.076)	-0.021 (0.071)	-0.047** (0.020)	-0.021 (0.053)	-0.009 (0.025)	0.031 (0.032)	-0.108** (0.042)	-0.047** (0.021)	-0.009 (0.057)
C&G level 3	-0.022 (0.050)	0.121*** (0.023)	0.130*** (0.006)	0.099*** (0.010)	0.086*** (0.011)	0.115*** (0.014)	0.011 (0.019)	0.048*** (0.011)	0.109*** (0.028)
C&G level 2	0.012 (0.037)	0.102*** (0.026)	0.069*** (0.007)	0.076*** (0.012)	0.016 (0.011)	0.065*** (0.012)	-0.053** (0.022)	0.016 (0.012)	-0.045 (0.029)
C&G level 1	-0.047 (0.052)	0.118** (0.050)	0.050*** (0.011)	0.015 (0.018)	-0.011 (0.015)	0.029* (0.017)	-0.138*** (0.027)	-0.012 (0.016)	-0.040 (0.034)
BTEC level 3	0.256*** (0.052)	0.192*** (0.033)	0.163*** (0.009)	0.131*** (0.021)	0.108*** (0.017)	0.165*** (0.019)	0.099*** (0.018)	0.078*** (0.012)	-0.002 (0.036)
BTEC level 2	-0.139 (0.097)	0.103 (0.130)	0.068*** (0.025)	0.021 (0.061)	0.051* (0.030)	0.093** (0.045)	-0.055 (0.049)	-0.006 (0.035)	0.095 (0.113)
BTEC level 1	0.008 (0.105)	-0.080 (0.091)	0.056** (0.025)	0.053 (0.042)	0.010 (0.038)	0.073* (0.040)	0.015 (0.053)	0.057* (0.032)	0.066 (0.088)
NVQ level 3	-0.026 (0.051)	0.039 (0.028)	0.057*** (0.010)	0.139*** (0.015)	0.084*** (0.013)	0.050*** (0.019)	0.031 (0.024)	0.025** (0.012)	0.046 (0.038)
NVQ level 2	-0.036 (0.043)	-0.006 (0.030)	-0.020** (0.008)	0.003 (0.014)	-0.034*** (0.011)	-0.047*** (0.014)	-0.120*** (0.020)	-0.099*** (0.012)	-0.047* (0.026)
NVQ level 1	-0.078 (0.062)	0.014 (0.044)	-0.039*** (0.013)	-0.028 (0.022)	-0.046*** (0.016)	-0.073*** (0.023)	-0.160*** (0.029)	-0.110*** (0.022)	-0.074* (0.045)
Trade App	0.005 (0.058)	0.008 (0.061)	0.069*** (0.014)	0.075*** (0.022)	0.010 (0.024)	0.065*** (0.025)	0.071* (0.042)	0.004 (0.026)	0.005 (0.047)
Other	0.037** (0.018)	0.025 (0.017)	0.042*** (0.004)	0.086*** (0.007)	0.030*** (0.006)	0.049*** (0.006)	0.143*** (0.010)	0.112*** (0.006)	0.089*** (0.014)
Voc (L D/K)	0.024 (0.034)	0.035 (0.024)	0.073*** (0.007)	0.088*** (0.011)	0.044*** (0.010)	0.042*** (0.012)	-0.029* (0.017)	0.029*** (0.010)	0.002 (0.022)
Obs.	1,686	2,255	33,652	12,891	19,601	13,850	10,795	12,939	4,371
R2	0.286	0.227	0.292	0.349	0.315	0.254	0.324	0.331	0.239

Note: Aggregated average returns to vocational qualifications – pooled Labour Force Survey data 1996-2009

* 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance.

Source: London Economics

In Table 54, we provide information on the average returns posted by women in different sectors of the economy. Although there are some similarities with the previous analysis considering all individuals, there are also some important differences and interesting variations in returns by gender. The first point to note is that for men, there are positive and significant average returns associated with qualifications at level 2 or level 3 across the entire economy, essentially irrespective of the sector. However, there is some degree of variation in the returns posted by females with women posting negative returns to several qualifications in the banking, finance and insurance sectors. In particular, even women in possession of RSA level 1 qualifications, which normally offer holders some pay premium, post a negative return of 2% in this sector ($\beta=-0.019$), while women with City & Guilds level 1 and BTEC level 1 qualifications post a negative return of between 7.0% and 6.2% ($\beta=-0.073$ and -0.064).

Table 54: Average returns to qualifications by sector – females

	Agriculture and Fishing	Energy and Water	Manufacturing	Construction	Distribution hotels and restaurants	Transport and Comms.	Banking, finance and insurance	Public Admin, education and health	Other
1+ A level	0.052 (0.133)	-0.023 (0.055)	0.107*** (0.019)	0.128*** (0.044)	0.055*** (0.018)	0.100*** (0.034)	0.090*** (0.014)	0.076*** (0.010)	0.108*** (0.037)
1+ AS level	0.005 (0.193)	0.042 (0.060)	0.022 (0.049)	0.039 (0.147)	-0.011 (0.040)	0.143* (0.074)	-0.000 (0.030)	-0.037 (0.027)	-0.186* (0.108)
5+ GCSEs A*-C	0.225*** (0.068)	0.055 (0.042)	0.228*** (0.010)	0.086** (0.034)	0.165*** (0.010)	0.164*** (0.018)	0.153*** (0.011)	0.159*** (0.007)	0.168*** (0.020)
4- GCSEs A*-C	0.140** (0.064)	-0.050 (0.042)	0.124*** (0.009)	0.051* (0.030)	0.102*** (0.008)	0.122*** (0.017)	0.086*** (0.011)	0.084*** (0.006)	0.082*** (0.019)
1+ GCSEs A*-G	0.063 (0.085)	-0.109** (0.051)	0.078*** (0.013)	-0.091** (0.043)	0.023** (0.011)	0.010 (0.024)	0.006 (0.015)	0.007 (0.009)	0.016 (0.025)
RSA level 3	0.000 (0.000)	0.025 (0.074)	0.094** (0.045)	0.042 (0.079)	0.027 (0.083)	0.178* (0.107)	0.068** (0.030)	0.079*** (0.024)	0.041 (0.090)
RSA level 2	0.000 (0.000)	0.083 (0.167)	0.212*** (0.043)	0.003 (0.146)	0.054 (0.064)	0.046 (0.052)	0.014 (0.035)	0.045* (0.024)	0.216** (0.097)
RSA level 1	0.094 (0.061)	0.026 (0.037)	0.066*** (0.009)	-0.043** (0.022)	0.066*** (0.010)	-0.005 (0.017)	-0.019** (0.009)	0.032*** (0.006)	0.107*** (0.021)
C&G level 3	0.363*** (0.130)	-0.044 (0.094)	0.076** (0.034)	-0.031 (0.079)	0.058** (0.025)	0.012 (0.064)	0.010 (0.044)	0.025 (0.020)	0.010 (0.042)
C&G level 2	0.017 (0.104)	0.154 (0.122)	0.057** (0.028)	-0.031 (0.064)	0.014 (0.018)	-0.047 (0.045)	-0.068** (0.030)	-0.025* (0.015)	0.062 (0.038)
C&G level 1	0.044 (0.189)	0.191** (0.093)	-0.006 (0.020)	0.047 (0.051)	-0.053*** (0.019)	-0.064 (0.046)	-0.073*** (0.023)	-0.017 (0.013)	0.003 (0.040)
BTEC level 3	0.118 (0.155)	0.017 (0.043)	0.129*** (0.021)	0.075* (0.044)	0.087*** (0.020)	0.096*** (0.036)	0.086*** (0.017)	0.068*** (0.011)	0.137*** (0.039)
BTEC level 2	0.060 (0.104)	0.095 (0.152)	0.053 (0.034)	-0.059 (0.090)	0.017 (0.034)	0.071 (0.060)	0.014 (0.034)	0.042* (0.025)	0.140** (0.055)
BTEC level 1	0.423** (0.165)	-0.131 (0.114)	0.030 (0.049)	0.512** (0.229)	0.025 (0.045)	0.058 (0.056)	-0.064** (0.026)	0.050* (0.027)	0.022 (0.107)
NVQ level 3	0.061 (0.101)	0.010 (0.046)	0.042*** (0.015)	0.002 (0.042)	0.050*** (0.014)	0.013 (0.020)	-0.005 (0.014)	0.022*** (0.007)	0.137*** (0.025)
NVQ level 2	0.061 (0.081)	-0.080 (0.049)	-0.049*** (0.013)	-0.008 (0.033)	-0.017* (0.010)	-0.020 (0.021)	-0.112*** (0.013)	-0.060*** (0.007)	0.042** (0.020)
NVQ level 1	-0.066 (0.113)	0.004 (0.060)	-0.037** (0.018)	-0.072 (0.060)	-0.052*** (0.015)	-0.050* (0.029)	-0.044* (0.023)	-0.060*** (0.013)	-0.058* (0.035)
Trade App	0.177 (0.403)	0.000 (0.000)	-0.021 (0.035)	0.000 (0.000)	0.002 (0.037)	0.114 (0.118)	-0.021 (0.112)	0.021 (0.035)	-0.013 (0.089)
Other	0.070 (0.047)	-0.026 (0.030)	0.082*** (0.008)	0.029 (0.023)	0.038*** (0.007)	0.090*** (0.013)	0.094*** (0.008)	0.073*** (0.005)	0.041*** (0.015)
Voc (L D/K)	-0.008 (0.153)	-0.069 (0.055)	0.051*** (0.016)	-0.061 (0.054)	0.038*** (0.013)	0.055** (0.025)	-0.048*** (0.014)	0.028*** (0.009)	0.062** (0.028)
N	336	484	10,394	1,210	13,062	3,453	11,033	20,773	3,283
R2	0.417	0.443	0.295	0.281	0.203	0.302	0.318	0.303	0.457

Note: Aggregated average returns to vocational qualifications – pooled Labour Force Survey data 1996-2009

* 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance.

Source: London Economics

This may be a reflection of the practices of this particular sector of the economy more so than the skills and training of those in possession of these low level vocational qualifications.

Women with BTEC level 3 qualifications post strong positive returns across almost all sectors of the economy, with manufacturing offering a 13.2% premium ($\beta=0.129$); distribution, hotels and restaurants offering a 9% premium ($\beta=0.087$); transport and communications offering a 10% premium ($\beta=0.096$); banking and finance 9% ($\beta=0.086$); and public administration, health and education 7% ($\beta=0.066$). For lower level BTEC qualifications, these returns essentially evaporate with only holders of BTEC level 1 qualifications in public administration, health and education posting a positive average return.

A similar outcome is associated with National Vocational Qualifications. There are positive returns achieved at level 3 by women in the manufacturing sectors of the economy (4.3% with $\beta=0.042$), and in the distribution, hotels and restaurants sector (5.1% and $\beta=0.05$), however, negative returns emerge in a number of sectors for those in possession of level 1 and level 2 qualifications, with women in possession of NVQ level 2 qualifications posting a negative return of 11% in banking and finance ($\beta=-0.112$) and -5.8% in public administration ($\beta=-0.06$). Similarly, at level 1, women post a negative average return of 5.2% in distribution, hotels and restaurants sector ($\beta=-0.052$) and 4.3% in the transport and communication sector ($\beta=-0.044$).

4.3 Average earnings returns by age band

In the final element of this section, we present some information on the average returns achieved by men and women depending upon their age. This is presented below in Table 55 for men and women combined and in Table 56 for men and Table 57 for women separately. In general terms, the analysis illustrates that the return to qualifications is generally not time invariant, with most qualifications displaying an increasing return as age increases (as before in relation to marginal returns). Considering some of the standard academic qualifications at the top of Table 55, the analysis illustrates that the average return associated with possession of at least 1 GCE 'A' level for those individuals aged between 21 and 35 stands at between 1.3% and 9.0% ($\beta=0.013$ and 0.086), which increases to 18.9% ($\beta=0.173$) for individuals aged between 61 and 64. Similarly, for individuals in possession of 5 or more GCSEs at grades A*-C, the average return posted for individuals aged between 21 and 30 stands at between 15.4% and 21.2% ($\beta=0.143$ and 0.192), while the average returns achieved by those aged between 41 and 64 was estimated to be in the region of 29%-35% ($\beta=0.263$ and 0.299).

The average returns to intermediate level vocational training appear to follow this pattern. In particular, for individuals in possession of City & Guilds qualifications at level 3, the average return for those aged between 31 and 50 is between 6.1% and 10.6% ($\beta=0.059$ and 0.101); however, this return increases to between 13.8% and 18.7% for those aged between 51 and 65 ($\beta=0.129$ and 0.171). A similar outcome is associated with those in possession of City & Guilds level 2 qualifications where small positive returns are posted by individuals below the age of 40, whereas for those in possession of these level 2 qualifications over the age of 40, the average return increases gradually from approximately 5.5% ($\beta=0.053$) for 46-50 year olds

to 9.1% ($\beta=0.087$) for those aged between 51 and 55 and more than 13.6% for those aged between 61 and 65 ($\beta=0.128$). As presented in Table 56, this outcome is driven by male outcomes associated with City & Guilds qualifications.

Age Band	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-64
1+ A level	0.020 (0.017)	0.014 (0.012)	0.070*** (0.012)	0.086*** (0.013)	0.125*** (0.014)	0.080*** (0.015)	0.094*** (0.016)	0.106*** (0.019)	0.091*** (0.028)	0.173** (0.077)
1+ AS level	-0.003 (0.026)	0.015 (0.021)	-0.014 (0.040)	0.116*** (0.042)	0.084* (0.046)	0.101 (0.090)	-0.096** (0.048)	0.036 (0.110)	0.351*** (0.118)	-0.187 (0.154)
5+ GCSEs A*-C	0.063*** (0.011)	0.143*** (0.008)	0.192*** (0.008)	0.213*** (0.008)	0.232*** (0.008)	0.263*** (0.008)	0.256*** (0.008)	0.267*** (0.009)	0.256*** (0.012)	0.299*** (0.029)
4- GCSEs A*-C	0.030*** (0.011)	0.078*** (0.008)	0.086*** (0.007)	0.105*** (0.007)	0.132*** (0.007)	0.151*** (0.007)	0.149*** (0.007)	0.168*** (0.008)	0.169*** (0.010)	0.152*** (0.023)
1+ GCSEs A*-G	0.002 (0.013)	0.030*** (0.009)	0.028*** (0.009)	0.023*** (0.009)	0.039*** (0.008)	0.054*** (0.009)	0.063*** (0.011)	0.059*** (0.015)	0.076*** (0.022)	0.190*** (0.069)
RSA level 3	-0.092 (0.110)	0.082 (0.063)	0.051 (0.042)	-0.014 (0.061)	0.117** (0.050)	0.070 (0.049)	0.137*** (0.033)	0.121*** (0.039)	0.063 (0.049)	-0.149 (0.163)
RSA level 2	0.174 (0.202)	0.007 (0.046)	0.095** (0.038)	0.098* (0.050)	0.010 (0.043)	0.019 (0.038)	0.068* (0.038)	0.119** (0.047)	0.122** (0.058)	0.086 (0.092)
RSA level 1	0.059*** (0.022)	0.061*** (0.011)	0.014 (0.010)	0.013 (0.010)	0.013 (0.010)	0.022** (0.009)	0.032*** (0.009)	0.048*** (0.010)	0.062*** (0.013)	0.031 (0.101)
C&G level 3	0.038 (0.037)	0.123*** (0.014)	0.081*** (0.011)	0.059*** (0.011)	0.092*** (0.010)	0.092*** (0.010)	0.101*** (0.010)	0.129*** (0.011)	0.134*** (0.013)	0.171*** (0.025)
C&G level 2	-0.021 (0.027)	0.041*** (0.015)	0.030*** (0.011)	-0.000 (0.010)	0.007 (0.010)	0.040*** (0.011)	0.053*** (0.011)	0.087*** (0.013)	0.058*** (0.016)	0.128*** (0.032)
C&G level 1	-0.047* (0.028)	0.008 (0.014)	-0.020 (0.013)	-0.027** (0.014)	-0.054*** (0.014)	0.016 (0.014)	0.002 (0.015)	-0.016 (0.018)	0.016 (0.024)	0.034 (0.050)
BTEC level 3	0.041** (0.019)	0.039*** (0.011)	0.089*** (0.010)	0.125*** (0.011)	0.158*** (0.013)	0.156*** (0.015)	0.137*** (0.017)	0.134*** (0.019)	0.108*** (0.022)	0.187*** (0.041)
BTEC level 2	0.030 (0.040)	0.002 (0.022)	0.030 (0.019)	0.037 (0.027)	0.030 (0.032)	-0.008 (0.037)	-0.024 (0.050)	0.092* (0.050)	0.212* (0.116)	-0.028 (0.134)
BTEC level 1	0.015 (0.049)	0.021 (0.025)	0.012 (0.024)	0.103*** (0.023)	-0.012 (0.031)	0.038 (0.036)	-0.038 (0.038)	-0.062 (0.065)	0.270*** (0.069)	-0.160 (0.289)
NVQ level 3	0.069*** (0.014)	0.053*** (0.008)	0.037*** (0.009)	0.036*** (0.012)	0.035*** (0.012)	0.008 (0.012)	0.033** (0.014)	0.034** (0.014)	0.046** (0.021)	0.022 (0.074)
NVQ level 2	-0.009 (0.010)	-0.020*** (0.007)	-0.046*** (0.008)	-0.070*** (0.010)	-0.100*** (0.011)	-0.093*** (0.010)	-0.083*** (0.010)	-0.080*** (0.013)	-0.048*** (0.016)	-0.013 (0.055)
NVQ level 1	-0.041** (0.016)	-0.021* (0.011)	-0.050*** (0.014)	-0.071*** (0.016)	-0.086*** (0.018)	-0.101*** (0.017)	-0.076*** (0.018)	-0.062*** (0.018)	-0.058** (0.027)	-0.105 (0.066)
Trade App	-0.156* (0.081)	0.052 (0.073)	0.041 (0.040)	0.026 (0.035)	0.127*** (0.029)	0.019 (0.024)	0.044** (0.020)	0.062*** (0.018)	0.057*** (0.019)	0.109*** (0.027)
Other	-0.009 (0.009)	0.027*** (0.006)	0.055*** (0.005)	0.066*** (0.005)	0.067*** (0.005)	0.069*** (0.005)	0.073*** (0.005)	0.061*** (0.006)	0.078*** (0.007)	0.092*** (0.013)
Voc (L D/K)	-0.021 (0.016)	0.026*** (0.010)	0.015* (0.009)	0.024*** (0.009)	0.055*** (0.009)	0.042*** (0.010)	0.052*** (0.010)	0.060*** (0.010)	0.067*** (0.013)	0.112*** (0.022)
N	10,002	15,913	19,945	22,392	23,751	23,573	22,597	19,954	13,688	4,391
R2	0.261	0.191	0.188	0.214	0.233	0.267	0.276	0.272	0.238	0.182

Note: Aggregated marginal returns to vocational qualifications – pooled Labour Force Survey data 1996-2009

* 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance.

Source: London Economics

Interestingly, an almost identical relationship between earnings and age band is displayed for those in possession of City & Guilds qualifications at level 1. Individuals below the age of 40 post negative returns to level 1 qualifications

(ranging between 3% and 6%), which is eliminated beyond this age; however, this effect is more concentrated amongst women than for men.

Table 56: Average returns qualifications by age – males										
Age Band	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65
1+ A level	-0.012 (0.026)	0.023 (0.019)	0.081*** (0.018)	0.088*** (0.018)	0.124*** (0.019)	0.082*** (0.023)	0.087*** (0.024)	0.082*** (0.029)	0.113*** (0.042)	0.173** (0.077)
1+ AS level	0.028 (0.036)	0.023 (0.031)	0.003 (0.064)	0.093 (0.080)	0.102 (0.072)	0.082 (0.151)	-0.054 (0.087)	0.097 (0.165)	0.470*** (0.098)	-0.187 (0.154)
5+ GCSEs A*-C	0.039*** (0.014)	0.131*** (0.011)	0.188*** (0.010)	0.224*** (0.010)	0.248*** (0.010)	0.269*** (0.011)	0.280*** (0.012)	0.295*** (0.014)	0.294*** (0.017)	0.299*** (0.029)
4- GCSEs A*-C	0.021 (0.014)	0.075*** (0.010)	0.093*** (0.009)	0.108*** (0.009)	0.141*** (0.009)	0.142*** (0.009)	0.158*** (0.010)	0.183*** (0.011)	0.184*** (0.014)	0.152*** (0.023)
1+ GCSEs A*-G	0.003 (0.016)	0.032*** (0.012)	0.037*** (0.011)	0.039*** (0.010)	0.050*** (0.010)	0.047*** (0.011)	0.066*** (0.014)	0.050*** (0.019)	0.084*** (0.029)	0.190*** (0.069)
RSA level 3	-0.171 (0.198)	-0.112 (0.146)	0.069 (0.111)	0.101 (0.118)	0.028 (0.135)	-0.203** (0.083)	0.163 (0.105)	-0.006 (0.093)	-0.096 (0.184)	-0.149 (0.163)
RSA level 2	-0.928*** (0.066)	0.012 (0.090)	-0.061 (0.087)	0.137 (0.115)	-0.132 (0.088)	-0.203** (0.096)	-0.034 (0.064)	0.149** (0.068)	0.196 (0.238)	0.086 (0.092)
RSA level 1	-0.077 (0.055)	-0.021 (0.034)	-0.083*** (0.026)	-0.069** (0.028)	-0.089*** (0.034)	-0.077** (0.031)	-0.076** (0.030)	0.017 (0.032)	0.082** (0.041)	0.031 (0.101)
C&G level 3	0.044 (0.040)	0.131*** (0.015)	0.089*** (0.012)	0.060*** (0.011)	0.094*** (0.011)	0.102*** (0.010)	0.109*** (0.010)	0.137*** (0.012)	0.145*** (0.014)	0.171*** (0.025)
C&G level 2	-0.030 (0.031)	0.062*** (0.017)	0.044*** (0.013)	0.006 (0.011)	0.015 (0.012)	0.053*** (0.012)	0.061*** (0.012)	0.100*** (0.014)	0.062*** (0.017)	0.128*** (0.032)
C&G level 1	-0.051 (0.034)	0.043** (0.019)	0.003 (0.016)	-0.010 (0.016)	-0.044*** (0.016)	0.018 (0.017)	0.014 (0.018)	0.004 (0.023)	0.030 (0.028)	0.034 (0.050)
BTEC level 3	0.080*** (0.024)	0.047*** (0.015)	0.101*** (0.013)	0.130*** (0.014)	0.168*** (0.017)	0.178*** (0.018)	0.140*** (0.020)	0.141*** (0.022)	0.109*** (0.024)	0.187*** (0.041)
BTEC level 2	0.082 (0.068)	0.026 (0.033)	-0.013 (0.028)	0.036 (0.035)	0.009 (0.047)	0.006 (0.049)	-0.026 (0.079)	0.077 (0.071)	0.124 (0.127)	-0.028 (0.134)
BTEC level 1	0.052 (0.057)	0.062* (0.034)	0.038 (0.031)	0.106*** (0.030)	-0.031 (0.045)	-0.036 (0.040)	-0.031 (0.056)	-0.021 (0.081)	0.247*** (0.043)	-0.160 (0.289)
NVQ level 3	0.082*** (0.020)	0.088*** (0.011)	0.062*** (0.011)	0.056*** (0.016)	0.052*** (0.019)	0.011 (0.019)	0.022 (0.025)	0.024 (0.022)	0.069* (0.038)	0.022 (0.074)
NVQ level 2	-0.006 (0.014)	-0.005 (0.010)	-0.024** (0.011)	-0.055*** (0.013)	-0.097*** (0.016)	-0.095*** (0.016)	-0.094*** (0.017)	-0.118*** (0.020)	-0.058** (0.023)	-0.013 (0.055)
NVQ level 1	-0.020 (0.021)	-0.007 (0.016)	-0.055*** (0.016)	-0.071*** (0.022)	-0.108*** (0.025)	-0.123*** (0.025)	-0.090*** (0.028)	-0.067** (0.030)	-0.083** (0.037)	-0.105 (0.066)
Trade App	-0.122 (0.103)	0.101* (0.056)	0.049 (0.042)	0.023 (0.037)	0.137*** (0.032)	0.027 (0.027)	0.054** (0.022)	0.082*** (0.020)	0.060*** (0.020)	0.109*** (0.027)
Other	0.013 (0.013)	0.036*** (0.008)	0.048*** (0.007)	0.051*** (0.007)	0.063*** (0.007)	0.067*** (0.007)	0.065*** (0.007)	0.060*** (0.008)	0.078*** (0.009)	0.092*** (0.013)
Voc (L D/K)	-0.029 (0.022)	0.036*** (0.013)	0.017 (0.010)	0.030*** (0.011)	0.063*** (0.011)	0.065*** (0.012)	0.061*** (0.012)	0.071*** (0.012)	0.079*** (0.016)	0.112*** (0.022)
N	5,880	9,059	12,273	14,946	15,619	14,691	13,608	12,304	9,359	4,391
R2	0.276	0.180	0.164	0.179	0.182	0.197	0.205	0.217	0.207	0.182

Note: Aggregated marginal returns to vocational qualifications – pooled Labour Force Survey data 1996-2009

* 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance.

Source: London Economics

The variation of economic outcomes associated with BTEC qualifications also varies depending on the age of the individual. For men (women) aged below 30 in possession of BTEC level 3 qualifications, the average return stands at between 5% and 10%; however, as age increases, the average returns to these level 3

vocational qualifications increase to between 13.9% and 19.4% for men aged between 31 and 45 ($\beta=0.130$ and 0.178 respectively) and between 10.8% and 11.7% for women ($\beta=0.103$ and 0.111). There is some variation in the average returns associated with level 1 and level 2 BTEC qualifications; however, no particular pattern that is obvious.

Finally, we consider the variation in the average return to National Vocational Qualifications by age band. As with other level 3 vocational qualifications, there appears to be a clear pattern between age band and earnings returns; however the direction of the relationship is somewhat reversed. In particular, for individuals in possession of NVQ level 3 qualifications, the average return posted when the holder is younger generally exceeds the return when the individual in possession of the qualification is older. In particular, a male aged between 21 and 30 in possession of a NVQ level 3 posts an earnings premium of between 6.5% and 9.0% compared to a similar individual without that qualification ($\beta=0.062$ and 0.088). For males aged between 31 and 40, there is still a positive return to the qualification; however, the return diminishes to between 5.2% and 5.6% for those men aged between 31 and 40 ($\beta=0.052$ and 0.056), further declining to zero beyond the age of 40 (with the exception of those men aged between 56 and 60 who achieve a small positive return). In a similar vein, for men in possession of NVQ level 1 or level 2 qualifications, the average return is either small or close to zero amongst the younger age bands becoming increasingly negative as age increases.

In Table 57, we have presented the equivalent information for women. Given the different likelihood of men and women achieving certain qualifications, some of the more pertinent results relate to the relationship between age and RSA qualification attainment. In particular, women with RSA level 3 qualifications register a relatively small earnings premium at younger ages; however, this return increases significantly with age – reaching more than 16.3% for women aged between 51 and 55 ($\beta=0.151$). The most consistent – and age invariant returns – are associated with those in possession of RSA qualifications at level 1, where the average premium to the qualification stands at between 3% and 8% across the age spectrum.

The returns to BTEC level 3 qualifications were consistently high from women, generally peaking for women aged between 36 and 50, when the premium stands at between 10.8% and 13.6% ($\beta=0.103$ and 0.127). These compare to an earnings premium of approximately 5% for those aged less than 25 or over 50. Again, there were positive returns for those in possession of level 1 and level 2 BTEC qualifications; however, there is no clear relationship between age and earnings.

For women in possession of National Vocational Qualifications, there were small positive returns associated with level 3 qualifications, with the returns relatively age invariant. In particular, women with level 3 qualifications posted earnings premiums of between 3% and 4% across the majority of the age spectrum. However, in general, there were negative returns associated with NVQ level 1 and level 2

qualifications that existed essentially independently of the age of the individual in possession of those qualifications.

Table 57: Average returns qualifications by age – females									
Age Band	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60
1+ A level	0.050** (0.022)	0.002 (0.015)	0.059*** (0.017)	0.086*** (0.019)	0.127*** (0.021)	0.080*** (0.019)	0.103*** (0.022)	0.138*** (0.025)	0.066** (0.033)
1+ AS level	-0.030 (0.039)	0.014 (0.029)	-0.034 (0.048)	0.142*** (0.043)	0.067 (0.061)	0.108 (0.106)	-0.130*** (0.049)	-0.038 (0.140)	0.106 (0.180)
5+ GCSEs A*-C	0.096*** (0.018)	0.157*** (0.012)	0.194*** (0.013)	0.185*** (0.013)	0.195*** (0.013)	0.252*** (0.011)	0.222*** (0.011)	0.232*** (0.012)	0.199*** (0.016)
4- GCSEs A*-C	0.047** (0.019)	0.087*** (0.012)	0.073*** (0.013)	0.092*** (0.013)	0.109*** (0.012)	0.156*** (0.010)	0.129*** (0.009)	0.144*** (0.011)	0.142*** (0.014)
1+ GCSEs A*-G	-0.003 (0.022)	0.028* (0.015)	0.006 (0.016)	-0.022 (0.016)	0.011 (0.015)	0.058*** (0.014)	0.056*** (0.016)	0.073*** (0.025)	0.054 (0.035)
RSA level 3	-0.039 (0.122)	0.123** (0.059)	0.064 (0.044)	-0.026 (0.069)	0.149*** (0.054)	0.095* (0.050)	0.151*** (0.034)	0.151*** (0.042)	0.091* (0.049)
RSA level 2	0.325* (0.172)	0.025 (0.054)	0.136*** (0.041)	0.098* (0.055)	0.051 (0.047)	0.077** (0.038)	0.098** (0.044)	0.095* (0.055)	0.105** (0.051)
RSA level 1	0.088*** (0.024)	0.082*** (0.011)	0.037*** (0.011)	0.037*** (0.011)	0.032*** (0.010)	0.036*** (0.010)	0.050*** (0.009)	0.061*** (0.010)	0.060*** (0.013)
C&G level 3	-0.032 (0.079)	0.015 (0.041)	-0.019 (0.029)	-0.000 (0.032)	0.035 (0.041)	0.001 (0.034)	-0.010 (0.028)	0.015 (0.041)	-0.043 (0.040)
C&G level 2	0.019 (0.050)	-0.068** (0.030)	-0.031 (0.023)	-0.049* (0.026)	-0.066*** (0.024)	-0.034 (0.025)	-0.002 (0.026)	-0.006 (0.030)	-0.002 (0.059)
C&G level 1	-0.043 (0.045)	-0.055*** (0.019)	-0.070*** (0.022)	-0.079*** (0.023)	-0.089*** (0.027)	0.013 (0.026)	-0.023 (0.026)	-0.053** (0.026)	-0.039 (0.044)
BTEC level 3	-0.009 (0.029)	0.026 (0.017)	0.069*** (0.015)	0.111*** (0.018)	0.127*** (0.022)	0.103*** (0.025)	0.110*** (0.028)	0.054 (0.036)	0.038 (0.042)
BTEC level 2	-0.015 (0.037)	-0.024 (0.028)	0.066*** (0.024)	0.039 (0.041)	0.053 (0.045)	-0.019 (0.056)	-0.026 (0.055)	0.128* (0.065)	0.411 (0.253)
BTEC level 1	-0.020 (0.080)	-0.035 (0.035)	-0.035 (0.036)	0.089*** (0.034)	-0.004 (0.043)	0.146** (0.063)	-0.055 (0.050)	-0.112 (0.103)	0.266* (0.139)
NVQ level 3	0.050*** (0.018)	0.008 (0.011)	0.005 (0.014)	0.006 (0.017)	0.022 (0.016)	0.006 (0.016)	0.032** (0.016)	0.030* (0.017)	0.027 (0.024)
NVQ level 2	-0.007 (0.015)	-0.037*** (0.009)	-0.072*** (0.013)	-0.088*** (0.015)	-0.099*** (0.014)	-0.087*** (0.013)	-0.080*** (0.013)	-0.059*** (0.016)	-0.059*** (0.020)
NVQ level 1	-0.073*** (0.025)	-0.036** (0.015)	-0.054** (0.024)	-0.075*** (0.022)	-0.060** (0.025)	-0.069*** (0.023)	-0.065*** (0.023)	-0.063*** (0.022)	-0.012 (0.037)
Trade App	-0.287*** (0.029)	-0.121 (0.259)	-0.142** (0.071)	0.032 (0.143)	0.077 (0.064)	-0.041 (0.040)	-0.032 (0.046)	-0.035 (0.034)	0.039 (0.058)
Other	-0.032** (0.013)	0.014* (0.008)	0.062*** (0.009)	0.088*** (0.009)	0.073*** (0.009)	0.073*** (0.008)	0.082*** (0.008)	0.060*** (0.009)	0.070*** (0.011)
Voc (L D/K)	-0.008 (0.023)	0.006 (0.016)	0.010 (0.017)	0.002 (0.017)	0.029 (0.018)	-0.018 (0.017)	0.035** (0.015)	0.036** (0.016)	0.036* (0.021)
N	4,122	6,854	7,672	7,446	8,132	8,882	8,989	7,650	4,329
R2	0.267	0.204	0.218	0.252	0.248	0.254	0.259	0.247	0.231

Note: Aggregated marginal returns to vocational qualifications – pooled Labour Force Survey data 1996-2009

* 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance.

Source: *London Economics*

5 Marginal employment returns to qualification attainment

5.1 Marginal employment returns to level 3 qualifications

In this section, we consider the marginal employment returns associated with intermediate and low level vocational qualifications. It is important to remember the fact that a number of these vocational qualifications are obtained through workplace training or while in employment. In particular, as the analysis below will illustrate, National Vocational Qualifications are associated with very high increases in the probability of being employed, and it is these qualifications that are in general most likely to be delivered in a workplace setting. It is always difficult to infer causality between the attainment of qualifications and employment outcomes, and therefore, there may be a strong possibility of reverse causality in operation. In terms of the analysis presented, following the analysis of McIntosh (2002), we consider the impact of qualification attainment on the probability of being in full time employment, although we do present additional results relating to the probability of being in either full time or part time employment in the Annex. Clearly, the consideration of alternative dependent variables will have significant impacts on the results by gender.

In Table 58, we present information on the difference in the likelihood of being in full time employment for those in possession of level 3 vocational qualifications compared to individuals in possession of either level 2 academic or vocational qualifications at a maximum. At this level of qualification attainment, the estimates indicate that there is a strong and positive relationship between vocational qualification attainment and the likelihood of being in employment with the association slightly more focused amongst women. In particular, men in possession of level 3 National Vocational Qualifications as their highest qualification are approximately 8.7 percentage points more likely to be employed compared to a male in possession of level 2 qualifications as a maximum, while women in possession of this qualification are approximately 16.8 percentage points more likely to be employed. Compared to NVQ level 3 qualifications, for men, only City & Guilds qualifications offer a similar employment boost, while for women, National Vocational Qualifications have the greatest effect of any level 3 vocational qualifications on female employment outcomes.

Table 58: Marginal employment returns to level 3 qualifications

	All	Males	Females
RSA level 3	0.058*** (0.018)	0.015 (0.060)	0.068*** (0.018)
City & Guilds level 3	0.136*** (0.004)	0.109*** (0.003)	0.038*** (0.010)
BTEC level 3	0.076*** (0.005)	0.054*** (0.005)	0.083*** (0.007)
NVQ level 3	0.152*** (0.004)	0.087*** (0.006)	0.168*** (0.005)

Note: Aggregated marginal returns to vocational qualifications – pooled Labour Force Survey data 1996-2009

Comparison group consists of those individuals in possession of either academic or vocational qualifications at level 2 or below
* 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance.

Source: *London Economics*

5.2 Marginal employment returns to level 2 qualifications

In Table 59, we provide the equivalent results for men and women in possession of level 2 vocational qualifications compared to individuals in possession of level 1 academic or vocational qualifications at a maximum. The estimates of the change in employment probabilities associated with the different types of vocational training are similar to those estimates relating to level 3 qualifications. For instance, in aggregate BTEC level 2 qualifications offer their holders an increase in the probability of being employed in aggregate, however, men are equally likely to be in full time employment compared to individuals in possession of level 1 qualifications, while women are approximately 11 percentage points more likely to be in employment. Unsurprisingly, RSA level 2 qualifications increase the probability of women being employed by more than 10 percentage points while City & Guilds level 2 qualifications boost the employment outcomes of men by almost 12 percentage points. National Vocational Qualifications offer a significant boost to the probability of men being in employment with males achieving a statistically significant 6.4 percentage point increase in the probability of being employed while women are approximately 13.1 percentage points more likely to be employed relative to the comparison group.

Table 59: Marginal employment returns to level 2 Qualifications

	All	Males	Females
RSA level 2	0.091*** (0.024)	-0.049 (0.073)	0.102*** (0.023)
City & Guilds level 2	0.118*** (0.006)	0.119*** (0.006)	0.028** (0.011)
BTEC level 2	0.087*** (0.020)	0.011 (0.030)	0.113*** (0.022)
NVQ level 2	0.125*** (0.005)	0.064*** (0.008)	0.131*** (0.006)

Note: Aggregated marginal returns to vocational qualifications – pooled Labour Force Survey data 1996-2009

Comparison group consists of those individuals in possession of either academic or vocational qualifications at level 1 or below
* 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance.

Source: *London Economics*

5.3 Marginal employment returns to level 1 qualifications

The results in Table 60 referring to the marginal employment returns associated with level 1 vocational qualifications again illustrate relatively positive and robust returns to qualifications compared to those in possession of no formally recognised qualifications; however, in a number of cases, the impact appears to be more focussed again amongst females, who (for example) are approximately 14 percentage points more likely to be employed if they possess a RSA level 1 or 11

percentage points if in possession of a NVQ level 1 qualification. Men in possession of a City & Guilds qualification at level 1 are almost 10 percentage points more likely to be employed relative to men in possession of no formally recognised qualifications, compared to just 2.6 percentage points more likely to be employed if in possession of NVQ level 1 qualifications.

Table 60: Marginal employment returns to level 1 Qualifications

	All	Males	Females
RSA level 1	0.156*** (0.007)	0.023 (0.024)	0.141*** (0.007)
City & Guilds level 1	0.105*** (0.009)	0.099*** (0.010)	0.090*** (0.015)
BTEC level 1	0.140*** (0.035)	0.136*** (0.046)	0.110*** (0.041)
NVQ level 1	0.083*** (0.011)	0.028* (0.016)	0.109*** (0.014)

Note: Aggregated marginal returns to vocational qualifications – pooled Labour Force Survey data 1996-2009

Comparison group consists of those individuals in possession of no formally recognised qualifications

* 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance.

Source: *London Economics*

5.4 Marginal employment returns by age

In this section, we provide an analysis of the marginal returns by age-band. In particular, we present the marginal probability of being employed on a full-time basis for all working age individuals (Table 61) and for men and women separately in Table 62 and Table 63 respectively. It is important to note that in some cases the estimates will be statistically insignificant due to some relatively small sample sizes.

The analysis relating to all individuals appears to suggest that there are statistically significant returns to individuals in possession of City & Guilds qualifications irrespective of the level of qualification attainment. In addition, the estimates appear to indicate that possession of these City & Guilds qualifications benefit younger workers to a greater extent compared to older workers. Individuals aged between 26 and 30 in possession of City & Guilds qualifications at level 1 (level 2 and level 3 respectively) are 6 percentage points (9 and 17 percentage points) more likely to be in employment relative to an individual in possession of the next highest level of qualification, and this compares with enhanced employment probabilities of 5.5 percentage points (11.8 and 11.4 percentage points) for individuals aged 56 to 60.

The findings in Table 61 also suggest that there are some significant employment effects associated with the attainment of other types of vocational qualification. National Vocational Qualifications at level 3 increase the probability of being in full time employment by between 12.4 and 17.3 percentage points, with the employment impact increasing with age. There is also a positive impact associated with NVQs at level 2, with a positive relationship between marginal employment probabilities and age again illustrated (9.2 percentage points at age 21-25 increasing to 19.0 percentage points age 56-60).

Table 61: Marginal employment returns to qualifications by age – all										
Age Band	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-64
RSA level 3	0.149 (0.155)	0.053 (0.104)	0.099 (0.067)	0.081 (0.050)	0.065 (0.047)	-0.037 (0.051)	0.126*** (0.040)	0.061 (0.041)	0.033 (0.050)	0.508*** (0.126)
C&G level 3	0.211*** (0.048)	0.178*** (0.020)	0.172*** (0.014)	0.115*** (0.012)	0.124*** (0.011)	0.135*** (0.010)	0.126*** (0.010)	0.111*** (0.011)	0.113*** (0.012)	0.078*** (0.016)
BTEC level 3	0.015 (0.021)	0.089*** (0.014)	0.121*** (0.012)	0.077*** (0.012)	0.055*** (0.013)	0.069*** (0.014)	0.088*** (0.017)	0.068*** (0.019)	0.034* (0.020)	0.021 (0.025)
NVQ level 3	0.123*** (0.014)	0.138*** (0.009)	0.108*** (0.010)	0.100*** (0.013)	0.140*** (0.012)	0.124*** (0.013)	0.145*** (0.014)	0.164*** (0.016)	0.162*** (0.024)	-0.012 (0.058)
RSA level 2	-0.163 (0.187)	0.047 (0.104)	0.098 (0.070)	0.173** (0.068)	0.037 (0.082)	0.170*** (0.056)	0.101* (0.056)	0.109** (0.051)	0.030 (0.071)	0.032 (0.177)
C&G level 2	0.121*** (0.045)	0.106*** (0.026)	0.091*** (0.020)	0.134*** (0.016)	0.124*** (0.016)	0.128*** (0.015)	0.127*** (0.016)	0.117*** (0.017)	0.118*** (0.019)	0.035 (0.024)
BTEC level 2	-0.016 (0.047)	0.105** (0.041)	0.107** (0.042)	0.109** (0.044)	0.068 (0.064)	0.167** (0.067)	-0.059 (0.110)	0.169 (0.105)	0.042 (0.136)	
NVQ level 2	0.101*** (0.014)	0.092*** (0.012)	0.055*** (0.014)	0.071*** (0.016)	0.108*** (0.016)	0.124*** (0.016)	0.147*** (0.017)	0.139*** (0.019)	0.190*** (0.024)	0.072 (0.064)
RSA level 1	-0.035 (0.089)	0.328*** (0.055)	0.143*** (0.043)	0.195*** (0.034)	0.113*** (0.029)	0.168*** (0.021)	0.167*** (0.015)	0.128*** (0.013)	0.126*** (0.015)	-0.091 (0.064)
C&G level 1	0.121** (0.061)	0.133*** (0.042)	0.072** (0.032)	0.130*** (0.030)	0.069** (0.028)	0.117*** (0.026)	0.131*** (0.023)	0.133*** (0.023)	0.052** (0.023)	0.057* (0.033)
BTEC level 1	0.006 (0.103)	0.179* (0.096)	0.218** (0.095)	-0.020 (0.090)	0.086 (0.116)	0.075 (0.096)	0.129 (0.106)	0.299*** (0.107)	0.275*** (0.100)	-0.013 (0.256)
NVQ level 1	-0.006 (0.029)	0.039 (0.031)	0.025 (0.033)	0.116*** (0.040)	0.141*** (0.040)	0.068** (0.034)	0.121*** (0.033)	0.090*** (0.034)	0.074** (0.033)	0.152* (0.080)

Note: Aggregated marginal returns to vocational qualifications – pooled Labour Force Survey data 1996-2009

* 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance.

Source: *London Economics*

There are some important differences in the probabilities of being employed depending on gender. The positive impact of City & Guilds qualifications is concentrated (unsurprisingly) amongst men, with women seeing little if any employment impact associated with possession of these qualifications. Similarly, women in possession of RSA level 1 qualifications are likely to have some positive impact on their employment outcomes, especially for those women who are older.

National Vocational Qualifications offer men and women substantial employment returns. Table 62 and Table 63 suggest that these economic benefits are concentrated amongst women (although men do still see some benefit especially at higher levels of qualification). In particular, possession of a National Vocational Qualification at level 3 increases the likelihood of a woman being in full time employment by between 10 and 25 percentage points, with a clear increasing relationship between this employment effect and age. For men, National Vocational Qualifications at level 3 have a 5 to 10 percentage point impact on marginal employment probabilities (except at the age of 61-65 where there is a (statistically insignificant) negative effect). At level 2, women in possession of a NVQ see a 10 to 20 percentage point increase in the probability of being in employment compared to a 5 to 10 percentage point effect for men.

All forms of vocational qualification appear to provide women holders with strong and positive enhanced employment probabilities.

Table 62: Marginal employment returns to qualifications by age – males

Age Band	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-64
RSA level 3	-0.016 (0.279)	-0.309 (0.295)	-0.317 (0.305)		-0.037 (0.173)		0.043 (0.142)	0.015 (0.155)	-0.213 (0.130)	0.508*** (0.126)
C&G level 3	0.213*** (0.048)	0.133*** (0.015)	0.112*** (0.009)	0.079*** (0.007)	0.086*** (0.007)	0.091*** (0.006)	0.093*** (0.007)	0.093*** (0.008)	0.118*** (0.011)	0.078*** (0.016)
BTEC level 3	-0.037 (0.028)	0.031* (0.017)	0.070*** (0.012)	0.046*** (0.012)	0.048*** (0.013)	0.066*** (0.014)	0.053*** (0.016)	0.054*** (0.017)	0.027 (0.021)	0.021 (0.025)
NVQ level 3	0.096*** (0.021)	0.099*** (0.011)	0.065*** (0.011)	0.031** (0.014)	0.022 (0.017)	0.053*** (0.018)	0.039* (0.022)	0.043* (0.026)	-0.028 (0.038)	-0.012 (0.058)
RSA level 2	-0.471*** (0.005)	-0.444* (0.235)	-0.240 (0.252)	0.113 (0.133)	0.246*** (0.004)	0.260*** (0.004)	-0.168 (0.195)	0.145 (0.170)	-0.283** (0.139)	0.010 (0.171)
C&G level 2	0.101** (0.050)	0.082*** (0.026)	0.090*** (0.020)	0.115*** (0.014)	0.116*** (0.013)	0.128*** (0.013)	0.110*** (0.013)	0.106*** (0.015)	0.122*** (0.018)	0.036 (0.024)
BTEC level 2	-0.015 (0.074)	-0.024 (0.063)	-0.038 (0.066)	0.016 (0.067)	-0.117 (0.115)	0.185*** (0.066)	-0.117 (0.122)	0.181 (0.142)	-0.154 (0.160)	
NVQ level 2	0.059*** (0.020)	0.037** (0.017)	0.042** (0.019)	-0.027 (0.024)	0.027 (0.023)	0.056** (0.025)	0.031 (0.028)	0.065* (0.035)	0.092** (0.041)	0.089 (0.064)
RSA level 1	-0.217** (0.105)	0.040 (0.156)	-0.112 (0.109)	0.086 (0.090)	0.109 (0.079)	0.055 (0.088)	0.002 (0.064)	0.057 (0.048)	-0.015 (0.052)	-0.091 (0.064)
C&G level 1	0.107 (0.077)	0.139*** (0.048)	0.068* (0.039)	0.113*** (0.030)	0.075** (0.030)	0.109*** (0.026)	0.089*** (0.023)	0.129*** (0.024)	0.049* (0.028)	0.057* (0.033)
BTEC level 1	-0.053 (0.159)	0.225** (0.106)		0.001 (0.129)	-0.103 (0.171)	0.002 (0.139)	0.108 (0.120)	0.185 (0.128)	0.312*** (0.092)	-0.013 (0.256)
NVQ level 1	-0.090** (0.037)	0.008 (0.042)	0.002 (0.047)	0.053 (0.049)	0.036 (0.054)	-0.004 (0.048)	0.073 (0.048)	-0.011 (0.051)	0.071 (0.051)	0.152* (0.080)

Note: Aggregated marginal returns to vocational qualifications – pooled Labour Force Survey data 1996-2009

* 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance.

Source: London Economics

Table 63: Marginal employment returns to qualifications by age – females

Age Band	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-59
RSA level 3	0.191 (0.175)	0.106 (0.110)	0.130* (0.072)	0.087* (0.052)	0.076 (0.048)	-0.030 (0.046)	0.149*** (0.045)	0.059 (0.041)	0.058 (0.045)
C&G level 3	0.134 (0.128)	0.171*** (0.051)	0.101*** (0.032)	0.005 (0.022)	0.018 (0.022)	0.047* (0.025)	0.039 (0.028)	0.065** (0.028)	0.008 (0.030)
BTEC level 3	0.077*** (0.029)	0.137*** (0.020)	0.132*** (0.016)	0.066*** (0.015)	0.032** (0.016)	0.035* (0.020)	0.087*** (0.025)	0.062* (0.032)	0.100** (0.043)
NVQ level 3	0.143*** (0.020)	0.157*** (0.013)	0.112*** (0.014)	0.112*** (0.015)	0.173*** (0.015)	0.141*** (0.016)	0.178*** (0.017)	0.201*** (0.020)	0.223*** (0.028)
RSA level 2	-0.009 (0.193)	0.079 (0.100)	0.092 (0.067)	0.152** (0.074)	0.013 (0.071)	0.163** (0.068)	0.115* (0.059)	0.090* (0.051)	0.056 (0.058)
C&G level 2	0.178* (0.099)	0.077 (0.053)	0.009 (0.029)	0.023 (0.025)	0.023 (0.026)	0.009 (0.031)	0.042 (0.035)	0.101** (0.040)	0.049 (0.046)
BTEC level 2	-0.010 (0.055)	0.151*** (0.052)	0.139*** (0.049)	0.091** (0.045)	0.095 (0.063)	0.126 (0.095)	0.032 (0.175)	0.124 (0.125)	0.209 (0.170)
NVQ level 2	0.138*** (0.018)	0.111*** (0.015)	0.050*** (0.015)	0.089*** (0.017)	0.119*** (0.018)	0.135*** (0.019)	0.183*** (0.021)	0.137*** (0.022)	0.193*** (0.027)
RSA level 1	0.047 (0.098)	0.335*** (0.061)	0.141*** (0.038)	0.162*** (0.031)	0.093*** (0.026)	0.160*** (0.021)	0.170*** (0.015)	0.125*** (0.013)	0.118*** (0.013)
C&G level 1	0.148 (0.101)	0.078 (0.057)	0.056 (0.039)	0.099** (0.041)	0.036 (0.041)	0.072* (0.040)	0.157*** (0.040)	0.090** (0.037)	0.057 (0.044)
BTEC level 1	0.049 (0.120)	0.125 (0.118)	0.061 (0.101)	-0.031 (0.080)	0.148 (0.118)	0.081 (0.105)	0.121 (0.137)	0.324** (0.136)	0.138 (0.151)
NVQ level 1	0.102** (0.044)	0.056 (0.037)	0.039 (0.034)	0.130*** (0.042)	0.178*** (0.045)	0.101*** (0.039)	0.127*** (0.038)	0.129*** (0.038)	0.064* (0.037)

Note: Aggregated marginal returns to vocational qualifications – pooled Labour Force Survey data 1996-2009

* 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance.

Source: London Economics

6 Average employment returns to qualification attainment

In this section of the report, we provide some detailed estimates of the average employment effects associated with qualification attainment. We consider a number of different employment metrics and in Table 64, we present the average enhanced probability of being in full time employment depending on the qualification. The results are again estimated using pooled Labour Force Survey data between 1996 and 2009 and the estimates generated cover the entire period as well as for each of the individual years. The analysis is replicated for men and women separately in Table 65 and Table 66 respectively.

The average employment effects across the sample are both large and significant in many cases and generally slightly higher than the employment effects associated with academic qualifications. Compared to individuals in possession of 1 GCE 'A' level, where the enhanced probability of being employed on a full time basis is approximately 4 percentage points, possession of a City & Guilds level 3 qualification increases the probability of being employed on a full time basis by as much as 12.8 percentage points, while a City & Guilds level 2 qualification increases the probability of being employed by approximately 7.5 percentage points. Unsurprisingly, there is some variation in the likelihood of being employed depending on gender, with men receiving a greater boost in the labour market compared to women. However, it is interesting to note that although there are large and significant employment effects associated with these qualifications, they have decreased over time. The average increase in the likelihood of being in full time employment for those in possession of level 3 qualifications (level 2 and level 1 respectively) was 16 percentage points in 1996 (14 and 7 percentage points) compared to an increased likelihood of 12 percentage points in 2009 (5 and 0 percentage points respectively).

The decreasing trend in employment probabilities is also illustrated when considering BTEC qualifications, albeit from a lower starting point. Individuals in possession of BTEC level 3 and level 2 qualifications enjoyed an increased probability of being employed of approximately 12 percentage points compared to those not in possession of the particular qualification in 1996; however, this premium had turned negative by 2009 with individuals in possession of BTEC level 2 qualifications approximately 8 percentage points less likely to be employed compared to their comparison group. Table 65 and Table 66 illustrate that there are strong average employment outcomes associated with National Vocational Qualifications, especially at level 3. In particular, for men over the period 1996 to 2009, the average increase in the probability of being in full time employment stands at approximately 8 percentage points and has increased from being statistically insignificantly different from zero to anything up to 13 percentage points. For women, the employment impact associated with NVQ level 3 qualifications is even greater, averaging approximately 16 percentage points over

the entire period and reaching up to 20 percentage points in some years. The only negative point is that unlike for men, the average employment effect for women has been marginally declining over time.

The impact of NVQs at levels 1 and 2 essentially mimic those presented in relation to NVQ level 3. There are strong positive returns associated with NVQs at level 2, which are greater for women than for men (8.7 percentage points compared to 1.3 percentage points on average), holding constant over time for women (8.7 in 1996 and 2009) and becoming stronger over time for men (-4.4 to +1.3 percentage points between 1996 and 2009). We present another selection of results estimating the impact of qualification attainment on employment outcomes – either on a full time *or* part time basis - in Table 85, Table 86 and Table 87 in the Annex.

Table 64: Average full time employment returns to academic and vocational qualifications – all

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Pooled
1+ A level	0.037* (0.021)	0.041** (0.016)	0.035** (0.016)	0.071*** (0.016)	0.040** (0.016)	0.035** (0.017)	0.022 (0.016)	0.005 (0.016)	0.040** (0.019)	0.019 (0.019)	0.029* (0.017)	0.021 (0.017)	0.025 (0.016)	0.069*** (0.017)	0.0362*** (0.00452)
1+ AS level	0.247*** (0.076)	-0.007 (0.084)	-0.040 (0.076)	0.002 (0.077)	0.112 (0.069)	0.040 (0.071)	0.035 (0.053)	0.012 (0.054)	-0.002 (0.059)	0.053 (0.050)	0.038 (0.039)	0.074* (0.043)	-0.001 (0.042)	0.110*** (0.037)	0.0324** (0.0146)
5+ GCSEs A*-C	0.160*** (0.009)	0.152*** (0.008)	0.142*** (0.007)	0.146*** (0.007)	0.132*** (0.008)	0.135*** (0.008)	0.145*** (0.007)	0.139*** (0.007)	0.138*** (0.009)	0.159*** (0.009)	0.131*** (0.008)	0.135*** (0.008)	0.135*** (0.008)	0.139*** (0.008)	0.143*** (0.00208)
4- GCSEs A*-C	0.107*** (0.008)	0.107*** (0.007)	0.105*** (0.007)	0.096*** (0.007)	0.103*** (0.007)	0.094*** (0.008)	0.089*** (0.007)	0.090*** (0.007)	0.100*** (0.008)	0.111*** (0.008)	0.099*** (0.007)	0.105*** (0.007)	0.097*** (0.007)	0.090*** (0.008)	0.101*** (0.00197)
1+ GCSEs DG	0.077*** (0.011)	0.068*** (0.010)	0.080*** (0.009)	0.096*** (0.009)	0.080*** (0.010)	0.078*** (0.011)	0.075*** (0.009)	0.077*** (0.009)	0.049*** (0.012)	0.056*** (0.013)	0.052*** (0.011)	0.063*** (0.011)	0.068*** (0.011)	0.078*** (0.011)	0.0758*** (0.00276)
RSA level 3	0.130*** (0.049)	0.018 (0.051)	0.082 (0.051)	0.076 (0.054)	0.089 (0.060)	0.062 (0.063)	0.123** (0.059)	-0.099 (0.074)	0.090 (0.065)	-0.054 (0.095)	-0.021 (0.078)	0.007 (0.078)	-0.090 (0.089)	-0.030 (0.086)	0.0432** (0.0172)
RSA level 2	0.045 (0.042)	0.039 (0.049)	-0.041 (0.049)	0.050 (0.056)	0.059 (0.050)	-0.080 (0.056)	-0.025 (0.046)	0.005 (0.057)	0.062 (0.062)	0.021 (0.061)	-0.028 (0.057)	0.006 (0.058)	-0.065 (0.056)	-0.031 (0.062)	0.00175 (0.0143)
RSA level 1	0.062*** (0.011)	0.039*** (0.010)	0.018* (0.010)	0.022** (0.010)	0.032*** (0.010)	0.002 (0.012)	0.014 (0.011)	0.006 (0.012)	0.011 (0.014)	0.013 (0.015)	-0.017 (0.014)	0.022 (0.014)	-0.010 (0.015)	0.001 (0.017)	0.0186*** (0.00317)
C&G level 3	0.165*** (0.016)	0.117*** (0.014)	0.153*** (0.013)	0.111*** (0.013)	0.122*** (0.013)	0.117*** (0.014)	0.123*** (0.012)	0.136*** (0.013)	0.141*** (0.015)	0.112*** (0.016)	0.134*** (0.014)	0.115*** (0.014)	0.113*** (0.014)	0.118*** (0.015)	0.128*** (0.00371)
C&G level 2	0.140*** (0.014)	0.086*** (0.012)	0.075*** (0.013)	0.070*** (0.013)	0.054*** (0.014)	0.068*** (0.016)	0.082*** (0.014)	0.068*** (0.015)	0.061*** (0.019)	0.049*** (0.019)	0.065*** (0.016)	0.057*** (0.017)	0.051*** (0.017)	0.051*** (0.018)	0.0744*** (0.00402)
C&G level 1	0.071*** (0.014)	-0.001 (0.016)	0.013 (0.017)	0.006 (0.019)	-0.004 (0.018)	-0.057*** (0.021)	-0.038** (0.018)	-0.005 (0.019)	-0.028 (0.023)	-0.007 (0.024)	-0.040* (0.022)	-0.045** (0.022)	-0.007 (0.023)	-0.022 (0.024)	-0.00261 (0.00508)
BTEC level 3	0.127*** (0.018)	0.110*** (0.016)	0.082*** (0.016)	0.100*** (0.016)	0.081*** (0.017)	0.119*** (0.018)	0.066*** (0.016)	0.070*** (0.016)	0.046** (0.020)	0.054*** (0.020)	0.042** (0.018)	0.012 (0.017)	0.048*** (0.017)	0.021 (0.018)	0.0692*** (0.00461)
BTEC level 2	0.122*** (0.037)	0.078** (0.036)	0.112*** (0.032)	0.086** (0.043)	0.094** (0.046)	0.030 (0.048)	-0.014 (0.043)	0.011 (0.044)	0.062 (0.046)	0.021 (0.046)	-0.018 (0.042)	-0.007 (0.042)	-0.028 (0.033)	-0.081** (0.033)	0.0271** (0.0108)
BTEC level 1	0.026 (0.040)	0.087** (0.037)	0.092** (0.036)	0.092** (0.036)	0.047 (0.042)	-0.064 (0.046)	0.005 (0.043)	0.070* (0.042)	-0.017 (0.051)	0.026 (0.059)	-0.035 (0.052)	-0.049 (0.049)	0.058 (0.043)	-0.072* (0.043)	0.0219* (0.0116)
NVQ level 3	0.100*** (0.029)	0.149*** (0.024)	0.158*** (0.019)	0.158*** (0.017)	0.167*** (0.016)	0.180*** (0.016)	0.161*** (0.014)	0.147*** (0.014)	0.173*** (0.015)	0.167*** (0.015)	0.133*** (0.012)	0.127*** (0.012)	0.122*** (0.012)	0.108*** (0.013)	0.143*** (0.00399)
NVQ level 2	0.040** (0.020)	0.009 (0.017)	0.030** (0.015)	0.054*** (0.015)	0.098*** (0.014)	0.088*** (0.014)	0.090*** (0.012)	0.079*** (0.012)	0.077*** (0.014)	0.091*** (0.013)	0.078*** (0.011)	0.072*** (0.011)	0.082*** (0.011)	0.080*** (0.011)	0.0691*** (0.00342)
NVQ level 1	-0.102*** (0.033)	0.030 (0.028)	-0.008 (0.023)	-0.054** (0.025)	-0.034 (0.023)	-0.004 (0.024)	0.021 (0.021)	-0.028 (0.021)	0.025 (0.022)	-0.048* (0.025)	-0.006 (0.020)	-0.033** (0.016)	-0.062*** (0.015)	-0.034** (0.015)	-0.0304*** (0.00543)
Trade App	0.124*** (0.020)	0.102*** (0.018)	0.062*** (0.018)	0.059*** (0.018)	0.103*** (0.017)	0.091*** (0.019)	0.056*** (0.018)	0.056*** (0.018)	0.100*** (0.021)	0.089*** (0.023)	0.058*** (0.021)	0.055 (0.044)	0.079** (0.034)	0.066* (0.035)	0.0775*** (0.00555)

Table 64: Average full time employment returns to academic and vocational qualifications – all

Other	0.109*** (0.006)	0.117*** (0.005)	0.103*** (0.005)	0.104*** (0.005)	0.106*** (0.005)	0.100*** (0.006)	0.106*** (0.005)	0.118*** (0.006)	0.100*** (0.007)	0.095*** (0.007)	0.118*** (0.006)	0.110*** (0.006)	0.112*** (0.006)	0.116*** (0.006)	0.108*** (0.00157)
Voc (L D/K)	0.107*** (0.016)	0.105*** (0.011)	0.098*** (0.010)	0.096*** (0.010)	0.110*** (0.010)	0.110*** (0.011)	0.112*** (0.010)	0.099*** (0.010)	0.104*** (0.012)	0.097*** (0.012)	0.116*** (0.010)	0.093*** (0.010)	0.077*** (0.011)	0.073*** (0.011)	0.101*** (0.00291)
N	35,192	44,575	47,110	45,223	43,140	33,896	43,371	41,677	29,623	26,782	36,795	35,859	34,759	31,694	529,696

Note: Aggregated average returns to vocational qualifications – pooled Labour Force Survey data 1996-2009

* 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance. . Grey shaded cells indicate that the difference with the pooled coefficient is significant at 5% level.

Source: London Economics

Table 65: Average full time employment returns to academic and vocational qualifications – males

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Pooled
1+ A level	-0.003 (0.027)	-0.018 (0.023)	-0.005 (0.022)	0.004 (0.021)	0.030 (0.021)	0.027 (0.023)	0.014 (0.021)	-0.026 (0.022)	0.010 (0.024)	0.010 (0.025)	0.020 (0.021)	-0.032 (0.022)	0.004 (0.021)	0.025 (0.023)	0.006 (0.006)
1+ AS level	0.129 (0.090)	-0.061 (0.142)	-0.125 (0.106)	0.091 (0.086)	0.114 (0.091)	-0.033 (0.107)	-0.080 (0.084)	-0.038 (0.064)	-0.071 (0.068)	0.003 (0.061)	0.047 (0.043)	-0.105* (0.058)	-0.144** (0.059)	0.076* (0.045)	-0.037* (0.019)
5+ GCSEs A*-C	0.123*** (0.009)	0.126*** (0.008)	0.114*** (0.008)	0.114*** (0.008)	0.106*** (0.008)	0.096*** (0.009)	0.117*** (0.008)	0.113*** (0.008)	0.110*** (0.009)	0.122*** (0.009)	0.093*** (0.009)	0.115*** (0.008)	0.103*** (0.009)	0.118*** (0.009)	0.113*** (0.002)
4- GCSEs A*-C	0.105*** (0.009)	0.099*** (0.008)	0.106*** (0.007)	0.100*** (0.007)	0.100*** (0.008)	0.094*** (0.009)	0.083*** (0.008)	0.100*** (0.008)	0.086*** (0.009)	0.094*** (0.009)	0.098*** (0.008)	0.100*** (0.008)	0.088*** (0.008)	0.090*** (0.009)	0.097*** (0.002)
1+ GCSEs D-G	0.099*** (0.012)	0.076*** (0.010)	0.104*** (0.009)	0.106*** (0.009)	0.090*** (0.010)	0.084*** (0.011)	0.085*** (0.010)	0.083*** (0.010)	0.053*** (0.014)	0.076*** (0.013)	0.063*** (0.012)	0.068*** (0.012)	0.084*** (0.011)	0.078*** (0.013)	0.085*** (0.003)
RSA level 3	0.175** (0.085)	0.035 (0.120)	-0.223 (0.140)	-0.241* (0.144)	-	-0.143 (0.185)	-0.030 (0.203)	-0.316 (0.274)	-	-	-	-	-0.183 (0.279)	-0.259 (0.212)	-0.033 (0.053)
RSA level 2	-0.229** (0.102)	-0.157 (0.128)	-0.240* (0.143)	-0.021 (0.134)	-0.124 (0.116)	-0.343** (0.144)	0.049 (0.101)	-0.223 (0.140)	-	0.111 (0.131)	-0.394** (0.172)	0.034 (0.188)	-0.190* (0.115)	-0.207 (0.179)	-0.161*** (0.038)
RSA level 1	-0.063* (0.036)	-0.047 (0.034)	-0.157*** (0.036)	-0.076** (0.034)	-0.059* (0.035)	-0.113*** (0.037)	-0.046 (0.034)	-0.190*** (0.041)	-0.017 (0.041)	-0.099* (0.055)	-0.111** (0.050)	-0.083 (0.054)	-0.236*** (0.059)	-0.156** (0.064)	-0.098*** (0.011)
C&G level 3	0.115*** (0.013)	0.090*** (0.012)	0.116*** (0.010)	0.083*** (0.011)	0.096*** (0.011)	0.109*** (0.011)	0.099*** (0.010)	0.101*** (0.010)	0.114*** (0.011)	0.094*** (0.013)	0.111*** (0.011)	0.096*** (0.011)	0.101*** (0.012)	0.109*** (0.013)	0.103*** (0.003)
C&G level 2	0.106*** (0.011)	0.075*** (0.011)	0.059*** (0.012)	0.062*** (0.012)	0.062*** (0.013)	0.062*** (0.015)	0.074*** (0.012)	0.083*** (0.013)	0.076*** (0.017)	0.028 (0.018)	0.070*** (0.015)	0.059*** (0.016)	0.044*** (0.016)	0.052*** (0.018)	0.069*** (0.004)
C&G level 1	0.056*** (0.013)	-0.001 (0.017)	0.011 (0.019)	0.006 (0.021)	0.013 (0.020)	-0.044* (0.024)	-0.055** (0.021)	-0.011 (0.021)	-0.026 (0.026)	0.036 (0.027)	-0.032 (0.027)	0.004 (0.025)	-0.001 (0.026)	-0.015 (0.030)	0.001 (0.006)
BTEC level 3	0.072*** (0.018)	0.084*** (0.016)	0.049*** (0.017)	0.068*** (0.016)	0.055*** (0.018)	0.066*** (0.019)	0.048*** (0.017)	0.027 (0.019)	0.015 (0.022)	0.053** (0.022)	0.046** (0.020)	0.018 (0.021)	0.054*** (0.020)	0.001 (0.022)	0.048*** (0.005)
BTEC level 2	0.041 (0.048)	-0.043 (0.048)	0.044 (0.042)	0.071 (0.069)	0.042 (0.056)	-0.003 (0.071)	0.006 (0.058)	0.007 (0.057)	0.031 (0.063)	0.046 (0.058)	-0.077 (0.058)	-0.039 (0.056)	-0.059 (0.049)	-0.039 (0.048)	-0.014 (0.015)
BTEC level 1	0.051 (0.046)	0.094** (0.040)	0.108*** (0.038)	0.125*** (0.039)	0.047 (0.053)	-0.047 (0.062)	0.054 (0.053)	0.052 (0.052)	0.055 (0.070)	0.062 (0.074)	0.038 (0.065)	-0.108 (0.069)	0.005 (0.060)	-0.129** (0.063)	0.030** (0.015)
NVQ level 3	-0.008 (0.032)	0.003 (0.031)	0.063** (0.025)	0.061*** (0.022)	0.065*** (0.020)	0.085*** (0.020)	0.060*** (0.019)	0.068*** (0.018)	0.115*** (0.018)	0.123*** (0.017)	0.095*** (0.016)	0.086*** (0.016)	0.093*** (0.016)	0.080*** (0.018)	0.079*** (0.005)
NVQ level 2	-0.044* (0.026)	-0.081*** (0.023)	-0.094*** (0.022)	-0.052*** (0.020)	0.014 (0.018)	0.011 (0.019)	0.016 (0.016)	0.025 (0.016)	0.043** (0.019)	0.050*** (0.018)	0.034** (0.016)	0.035** (0.015)	0.078*** (0.014)	0.049*** (0.015)	0.013*** (0.005)
NVQ level 1	-0.191*** (0.044)	-0.066* (0.035)	-0.065** (0.031)	-0.142*** (0.034)	-0.063** (0.030)	-0.065** (0.032)	-0.034 (0.027)	-0.062** (0.028)	-0.015 (0.030)	-0.095*** (0.034)	-0.007 (0.027)	-0.053** (0.022)	-0.080*** (0.021)	-0.046** (0.022)	-0.059*** (0.007)
Trade App	0.086*** (0.016)	0.097*** (0.014)	0.068*** (0.014)	0.065*** (0.014)	0.103*** (0.012)	0.089*** (0.014)	0.055*** (0.014)	0.072*** (0.014)	0.103*** (0.014)	0.096*** (0.016)	0.070*** (0.017)	0.061* (0.033)	0.084*** (0.025)	0.061** (0.030)	0.078*** (0.004)

Table 65: Average full time employment returns to academic and vocational qualifications – males

Other	0.080*** (0.007)	0.102*** (0.006)	0.091*** (0.006)	0.088*** (0.006)	0.097*** (0.006)	0.076*** (0.007)	0.089*** (0.006)	0.094*** (0.006)	0.086*** (0.008)	0.085*** (0.008)	0.098*** (0.007)	0.106*** (0.007)	0.092*** (0.007)	0.103*** (0.008)	0.092*** (0.002)
Voc (L D/K)	0.086*** (0.015)	0.093*** (0.011)	0.082*** (0.010)	0.085*** (0.010)	0.097*** (0.010)	0.101*** (0.011)	0.103*** (0.010)	0.097*** (0.010)	0.102*** (0.011)	0.086*** (0.012)	0.117*** (0.010)	0.108*** (0.010)	0.069*** (0.011)	0.088*** (0.012)	0.095*** (0.003)
N	17,382	22,344	23,406	22,450	21,541	16,983	21,715	20,964	14,953	13,588	18,742	18,487	18,056	16,513	267,146

Note: Aggregated average returns to vocational qualifications – pooled Labour Force Survey data 1996-2009

* 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance. Grey shaded cells indicate that the difference with the pooled coefficient is significant at 5% level

Source: *London Economics*

Table 66: Average full time employment returns to academic and vocational qualifications – females

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Pooled
1+ A level	0.054** (0.024)	0.072*** (0.019)	0.051*** (0.019)	0.101*** (0.019)	0.039** (0.019)	0.025 (0.020)	0.023 (0.019)	0.025 (0.019)	0.063*** (0.024)	0.022 (0.023)	0.028 (0.021)	0.050** (0.021)	0.044** (0.021)	0.099*** (0.022)	0.051*** (0.005)
1+ AS level	0.307*** (0.107)	0.023 (0.087)	0.011 (0.082)	-0.023 (0.086)	0.089 (0.087)	0.062 (0.079)	0.047 (0.057)	0.034 (0.064)	0.069 (0.072)	0.068 (0.060)	0.025 (0.049)	0.169*** (0.054)	0.086* (0.050)	0.111** (0.050)	0.065*** (0.017)
5+ GCSEs A*-C	0.155*** (0.012)	0.145*** (0.010)	0.138*** (0.010)	0.147*** (0.010)	0.134*** (0.010)	0.149*** (0.011)	0.149*** (0.010)	0.138*** (0.010)	0.145*** (0.012)	0.168*** (0.012)	0.148*** (0.011)	0.135*** (0.011)	0.144*** (0.011)	0.141*** (0.011)	0.147*** (0.003)
4- GCSEs A*-C	0.086*** (0.010)	0.097*** (0.009)	0.089*** (0.009)	0.082*** (0.009)	0.092*** (0.010)	0.085*** (0.011)	0.085*** (0.010)	0.072*** (0.010)	0.100*** (0.011)	0.109*** (0.012)	0.090*** (0.010)	0.095*** (0.010)	0.092*** (0.011)	0.082*** (0.011)	0.092*** (0.003)
1+ GCSEs D-G	0.046*** (0.015)	0.055*** (0.013)	0.040*** (0.013)	0.073*** (0.013)	0.070*** (0.014)	0.064*** (0.015)	0.061*** (0.013)	0.067*** (0.013)	0.037** (0.017)	0.031* (0.018)	0.041*** (0.015)	0.047*** (0.016)	0.045*** (0.016)	0.066*** (0.016)	0.058*** (0.004)
RSA level 3	0.145*** (0.055)	0.043 (0.050)	0.119** (0.053)	0.121** (0.057)	0.091 (0.062)	0.088 (0.065)	0.127** (0.065)	-0.058 (0.063)	0.065 (0.068)	-0.047 (0.085)	-0.041 (0.073)	-0.007 (0.077)	-0.078 (0.077)	-0.004 (0.083)	0.057*** (0.017)
RSA level 2	0.092** (0.043)	0.066 (0.048)	0.010 (0.046)	0.070 (0.058)	0.108** (0.053)	-0.032 (0.051)	-0.022 (0.045)	0.042 (0.057)	0.124** (0.061)	-0.005 (0.062)	0.006 (0.053)	0.023 (0.058)	-0.028 (0.056)	-0.002 (0.059)	0.033** (0.014)
RSA level 1	0.089*** (0.011)	0.062*** (0.010)	0.052*** (0.010)	0.047*** (0.010)	0.055*** (0.010)	0.029** (0.012)	0.036*** (0.011)	0.036*** (0.011)	0.024* (0.014)	0.031** (0.015)	0.007 (0.013)	0.039*** (0.014)	0.015 (0.015)	0.017 (0.016)	0.044*** (0.003)
C&G level 3	0.103*** (0.040)	0.041 (0.036)	0.024 (0.034)	0.013 (0.032)	0.035 (0.032)	-0.051 (0.033)	0.015 (0.031)	0.089*** (0.033)	0.060 (0.037)	0.028 (0.039)	0.048 (0.036)	0.042 (0.036)	0.004 (0.036)	0.027 (0.040)	0.035*** (0.009)
C&G level 2	0.045 (0.032)	0.024 (0.023)	0.036 (0.025)	0.005 (0.025)	-0.038 (0.025)	0.031 (0.028)	0.028 (0.028)	-0.034 (0.027)	-0.003 (0.032)	0.070** (0.035)	0.003 (0.030)	0.012 (0.032)	0.032 (0.033)	0.027 (0.035)	0.017** (0.008)
C&G level 1	0.057*** (0.021)	-0.012 (0.022)	0.004 (0.024)	-0.006 (0.025)	-0.028 (0.025)	-0.050* (0.027)	-0.011 (0.024)	0.004 (0.026)	-0.019 (0.031)	-0.051 (0.033)	-0.043 (0.031)	-0.079*** (0.029)	-0.004 (0.035)	-0.024 (0.034)	-0.010 (0.007)
BTEC level 3	0.149*** (0.028)	0.098*** (0.024)	0.100*** (0.024)	0.109*** (0.023)	0.093*** (0.024)	0.150*** (0.028)	0.071*** (0.023)	0.101*** (0.023)	0.075*** (0.028)	0.052* (0.029)	0.039 (0.025)	0.019 (0.024)	0.038 (0.024)	0.046* (0.026)	0.079*** (0.007)
BTEC level 2	0.117*** (0.045)	0.153*** (0.044)	0.133*** (0.041)	0.078 (0.050)	0.100* (0.060)	0.049 (0.054)	-0.019 (0.049)	0.038 (0.053)	0.083 (0.055)	0.011 (0.058)	0.022 (0.051)	0.037 (0.051)	0.015 (0.039)	-0.086** (0.037)	0.052*** (0.013)
BTEC level 1	0.020 (0.049)	0.067 (0.046)	0.065 (0.048)	0.059 (0.045)	0.052 (0.052)	-0.047 (0.053)	-0.023 (0.051)	0.080 (0.054)	-0.028 (0.059)	0.017 (0.073)	-0.060 (0.062)	0.013 (0.058)	0.091* (0.054)	-0.021 (0.051)	0.023 (0.014)
NVQ level 3	0.184*** (0.038)	0.239*** (0.031)	0.184*** (0.025)	0.191*** (0.023)	0.210*** (0.022)	0.216*** (0.022)	0.205*** (0.019)	0.178*** (0.018)	0.189*** (0.020)	0.176*** (0.020)	0.146*** (0.016)	0.148*** (0.015)	0.133*** (0.016)	0.118*** (0.016)	0.163*** (0.005)
NVQ level 2	0.087*** (0.024)	0.067*** (0.019)	0.098*** (0.018)	0.107*** (0.017)	0.121*** (0.017)	0.112*** (0.017)	0.116*** (0.015)	0.095*** (0.015)	0.081*** (0.017)	0.101*** (0.017)	0.093*** (0.014)	0.079*** (0.013)	0.079*** (0.013)	0.088*** (0.013)	0.087*** (0.004)
NVQ level 1	-0.008 (0.038)	0.122*** (0.035)	0.040 (0.028)	0.014 (0.028)	-0.004 (0.027)	0.046 (0.029)	0.060** (0.026)	-0.000 (0.024)	0.044* (0.026)	-0.003 (0.030)	-0.008 (0.025)	-0.018 (0.019)	-0.041** (0.017)	-0.025 (0.016)	-0.005 (0.006)
Trade App	0.150*** (0.050)	0.046 (0.042)	0.051 (0.042)	0.025 (0.042)	0.046 (0.047)	0.050 (0.050)	0.098** (0.048)	-0.021 (0.045)	-0.029 (0.066)	-0.006 (0.064)	-0.003 (0.062)	0.128 (0.142)	-0.082 (0.126)	0.233* (0.137)	0.040*** (0.015)

Table 66: Average full time employment returns to academic and vocational qualifications – females

Other	0.101*** (0.008)	0.098*** (0.007)	0.085*** (0.007)	0.089*** (0.007)	0.089*** (0.007)	0.099*** (0.009)	0.098*** (0.007)	0.118*** (0.008)	0.094*** (0.010)	0.084*** (0.010)	0.118*** (0.009)	0.096*** (0.009)	0.113*** (0.009)	0.116*** (0.009)	0.100*** (0.002)
Voc (L D/K)	0.077*** (0.024)	0.076*** (0.017)	0.071*** (0.015)	0.066*** (0.015)	0.080*** (0.016)	0.064*** (0.017)	0.070*** (0.015)	0.063*** (0.015)	0.060*** (0.019)	0.076*** (0.019)	0.071*** (0.017)	0.036** (0.017)	0.067*** (0.017)	0.025 (0.018)	0.065*** (0.005)
N	17,810	22,231	23,704	22,773	21,593	16,913	21,656	20,713	14,662	13,192	18,051	17,368	16,703	15,181	262,550

Note: Aggregated average returns to vocational qualifications – pooled Labour Force Survey data 1996-2009

* 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance. Grey shaded cells indicate that the difference with the pooled coefficient is significant at 5% level

Source: London Economics

7 Returns to Apprenticeships

In this section, we have provided some estimates of the returns associated with apprenticeships²⁵. There are two different levels of apprenticeship: the Foundation level apprenticeship that is considered to be equivalent to a level 2 vocational qualification; and the Advanced level apprenticeship, which is considered to be equivalent to a level 3 vocational qualification. As a result of the relatively recent introduction of these qualifications, we can only use information from the Labour Force Surveys between 2004 and 2009 to consider the economic returns associated with these qualifications; however, we have also undertaken an assessment of the returns associated with traditional trade apprenticeships to improve the analysis. In general, given the relatively small sample sizes associated with Advanced or Foundation level apprenticeships, it has not been possible to undertake the analysis at a particularly high degree of disaggregation.

7.1 Marginal earnings returns

In Table 67, we present estimates of the marginal earnings returns associated with Advanced level and trade apprenticeships compared to those individuals in possession of level 2 academic or vocational qualifications, while in Table 68 we present the equivalent information for men and women in possession of Foundation level apprenticeships. The results in Table 67 suggest that there is a positive return associated with apprenticeships. In particular, compared to individuals in possession of level 2 qualifications, the marginal return is approximately 13.3% ($\beta=0.125$). This compares relatively favourably to the return associated with a traditional apprenticeship, where the return stands at approximately 4.1% ($\beta=0.041$).

Table 67: Marginal earnings returns to Advanced level apprenticeships – all			
	All	Males	Females
<i>Comparison</i>	Level 2 Qualifications		
Advanced apprenticeship	0.125*** (0.024)	0.169*** (0.028)	0.016 (0.039)
Trade apprenticeship	0.041*** (0.009)	0.050*** (0.010)	-0.035** (0.016)

Note: pooled Labour Force Survey data 2004-2009

Level 2: level 2 vocational and/or level 2 academic qualifications as a maximum; * 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance.

Source: *London Economics*

Unsurprisingly, there is some degree of variation in the marginal returns depending on the gender of the individuals. Men in general post higher returns compared to women irrespective of the fundamental features of the apprenticeship. Table 67 illustrates that men post a statistically significant return of approximately 18.4%

²⁵ Note that the term 'Modern' was dropped from Modern apprenticeship in 2004 although we sometimes continue to adopt the original title to differentiate it from traditional trade apprenticeships

($\beta=0.169$) to an Advanced level apprenticeship compared to a return of 1.6% for women ($\beta=0.016$).

Compared to the recent work undertaken by McIntosh (2007), we find lower marginal earnings returns associated with Advanced level apprenticeships. In particular, McIntosh (2007) estimates that the marginal return to an Advanced level apprenticeship stands at 17.7% compared to 13.3% presented here (see Table 69). The difference is more marked for women (14.7% compared to 1.6%) than for men (22% and 18.4%) respectively. The differences in results should not be interpreted as highlighting a drop in the return to apprenticeships over time. As detailed at the end of this section, the most likely explanation is that the different results are driven by methodological differences.

In Table 68, we present the equivalent results for those in possession of Foundation level apprenticeships. The analysis illustrates that compared to individuals in possession of either level 1 or level 2 qualifications, there is a 7.9% ($\beta=0.076$) marginal return associated with Foundation level apprenticeships. This is slightly higher than the return achieved by those in possession of recognised trade apprenticeships (6.7% ($\beta=0.065$)).

Table 68: Marginal earnings returns to Foundation level apprenticeships – all			
	All	Males	Females
<i>Comparison</i>	Level 2/level 1 Qualifications		
Foundation apprenticeship	0.076*** (0.019)	0.084*** (0.022)	0.000 (0.039)
Trade apprenticeship	0.065*** (0.007)	0.066*** (0.008)	-0.038** (0.018)

Note: pooled Labour Force Survey data 2004-2009. Level 2/level 1: level 2 or level 1 vocational and/or academic qualifications as a maximum; * 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance.

Source: *London Economics*

As with Advanced level apprenticeships, there are some differences depending on gender. Men again achieve higher returns to Foundation level apprenticeships, posting a return of 8.8% ($\beta=0.084$) over those in possession of level 1 or level 2 qualifications compared to men in possession of traditional apprenticeships who post a return of 6.7% ($\beta=0.066$). Women in possession of a Foundation level apprenticeship achieve a zero return over women in possession of level 2 or level 1 qualifications, while women in possession of traditional trade apprenticeships achieve 3.7% lower earnings ($\beta=-0.038$) compared to women in possession of level 1 or level 2 qualifications.

Again, compared to the recent work undertaken by McIntosh (2007), we estimate lower marginal returns to apprenticeships. McIntosh (2007) estimates that the marginal return to a Foundation level apprenticeship stands at 15.6% compared to approximately 7.9% presented here. For men McIntosh (2007) estimated a return around 20% (compared to almost 9% here) and for women a smaller and not statistically significant return (3.8% compared to no significant effect here).

As previously mentioned, the results should not be interpreted as highlighting a drop in the return to an apprenticeship over time²⁶. The different results are driven by methodological differences, and below, we describe the primary reasons why there may be differences in the results presented here and those generated by McIntosh (2007).

Differences in the treatment group

In the McIntosh paper (2007), the Labour Force Survey classification for highest qualification (HIQUAL) was adopted. The Labour Force Survey ranks a NVQ level 3 qualification above all other level 3 qualifications; that means respondents with a NVQ level 3 qualification as highest qualification can also hold other level 3 (academic or vocational) qualifications. In order to isolate the effect of Advanced level apprenticeships, we only considered respondents in possession of an Advanced level apprenticeship or an Advanced level apprenticeship plus a NVQ level 3 as a level 3 qualification, while we removed from the treatment group all observations also holding any other qualification at level 3. For example someone holding a NVQ level 3 qualification, 2 or more GCE 'A' levels and an Advanced level apprenticeship (and no other higher level qualifications) will be classified as having an NVQ3 as highest qualification by the Labour Force Survey, but won't be included in our treatment group.

Differences in the comparison group

Office for National Statistics (ONS) research has estimated that 10% of those holding "any other professional/ work related/foreign qualifications" are in possession of qualifications equivalent to a level 3 qualification; 35% at level 2 with the remaining 55% being level 1 or equivalent. Consequently, and as undertaken in other elements of the analysis presented here, we removed these individuals from the level 1 comparison group; however, we do not believe they can be ranked as a full level 2 qualification. Therefore, we only included them in the comparison group when considering respondents having either level 2 or level 1 as a highest qualification, but not when we restrict the comparison group to those having a level 2 qualification (only) as highest qualification. For apprenticeships this would generate a difference in the comparison group when comparing level 3 (Advanced level apprenticeship) to level 2 as a highest qualification, given that we would exclude from the comparison group all those individuals having "other qualifications" as their highest qualification.

Differences in the dependent variable and the set of control variables

For consistency with the rest of the report we use (the log of) real gross *hourly* earnings as dependent variable in the various econometric analyses, while McIntosh uses (the log of) real gross *weekly* earnings. This seems to have a significant effect on the magnitude of the estimated coefficients. We also included a

²⁶ In fact, when we replicated McIntosh's results using a similar methodological approach we found that the returns to an Apprenticeship at advanced level stand at 26.6% ($\beta=0.236$) for men and 13.3% ($\beta=0.125$) for women. For Apprenticeships at Foundation level, the earnings returns stand at 11.9% ($\beta=0.112$) for men and 4.8% ($\beta=0.047$) for women, with the latter estimate being not statistically significant. See Table 69.

variable measuring the length of time continuously employed in our model to control for possible labour market shocks.

Detailed comparison of studies

In Table 69, we have presented the results generated by McIntosh (2007), we well as an attempted replication of these results using weekly earnings. We have also presented the London Economics' model specification with either weekly or hourly earnings as the dependent variable to better understand the role of different model specifications in determining the results.

When we replicated McIntosh's results using a similar methodological approach (though over a longer time period), we found that the returns to an apprenticeship at Advanced level stand at 22.4% ($\beta=0.202$), which is approximately 5 percentage points higher than McIntosh's estimates. We also found that the returns to an apprenticeship at Foundation level stand at 11.7% ($\beta=0.111$), which is approximately 4 percentage points lower than McIntosh's estimates. However, when the analysis was repeated using the London Economics' model specification with weekly earnings (instead of hourly earnings), the returns relating to apprenticeships at Advanced level were in line with McIntosh's results (though lower for women), while the returns associated with apprenticeships at Foundation level were lower overall and for men in particular. The move from weekly to hourly earnings reduces the earnings return by approximately 5.1 percentage points at Advanced level and 2.1 percentage points at Foundation level.

These results indicate that the difference in the earnings return between the original McIntosh results at Advanced level (and at Foundation level for women) appear to be predominantly as a result of the decision to use weekly instead of hourly earnings as the dependent variable in the model specification (implying that the possession of an apprenticeship has a significant effect on the number of hours worked). In the case of the other Foundation level results, approximately one-third of the differences in the estimates are as a result of the weekly/hourly earnings approach, with the remaining differences driven by the various other differences in model specifications.

Table 69: Marginal earnings returns to modern apprenticeships – Comparison table

	McIntosh (2004/05)			LE Replication of McIntosh (2004/09)			LE Specification with weekly earnings (2004/09)			LE Specification (2004/09)		
	<i>Weekly earnings</i>			<i>Weekly earnings</i>			<i>Weekly earnings</i>			<i>Hourly earnings</i>		
	All	M	F	All	M	F	All	M	F	All	M	F
AMA	0.163*** (0.034)	0.202*** (0.039)	0.133** (0.066)	0.202*** (0.021)	0.236*** (0.024)	0.125*** (0.042)	0.169*** (0.025)	0.216*** (0.030)	0.056 (0.041)	0.125*** (0.024)	0.169*** (0.028)	0.016 (0.039)
FMA	0.145*** (0.032)	0.181*** (0.038)	0.038 (0.066)	0.111*** (0.019)	0.112*** (0.021)	0.047 (0.040)	0.095*** (0.019)	0.096*** (0.022)	0.038 (0.041)	0.076*** (0.019)	0.084*** (0.022)	0.000 (0.039)

Note: Aggregated marginal returns to vocational qualifications – pooled Labour Force Survey data 2004-2009

Level 2: level 2 vocational and/or level 2 academic qualifications as a maximum. * 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance.

Source: London Economics

Neither approach can be considered 'better' than the other; however, the differences in the modelling do illustrate the importance of understanding the detail of the model specifications when comparing the results from different authors.

7.2 Employment Returns

In Table 70, we present the employment returns associated with Advanced level apprenticeships at an aggregate level, and also disaggregated results relating to men and women. The estimates indicate that there are significant employment returns associated with all forms of apprenticeship. Individuals in possession of recognised trade apprenticeships are 8.7% more likely to be employed compared to individuals in possession of level 2 academic or vocational qualifications, while individuals in possession of Advanced level apprenticeships are almost 13.8% more likely to be employed. As before, the enhanced employment probability is concentrated amongst men. Men with traditional apprenticeships achieve a 9.2 percentage point greater probability of being employed compared to women who are actually no more likely to be employed compared to women in possession level 2 qualifications.

Table 70: Marginal employment returns to Advanced level apprenticeships – all			
	All	Males	Females
<i>Comparison</i>	Level 2 Qualifications		
Advanced apprenticeship	0.138*** (0.028)	0.136*** (0.018)	0.029 (0.067)
Trade apprenticeship	0.087*** (0.006)	0.092*** (0.007)	0.005 (0.012)

Note: pooled Labour Force Survey data 2004-2009. Level 2: level 2 vocational and/or level 2 academic qualifications as a maximum; * 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance.

Source: *London Economics*

In Table 71 we provide the estimates of the enhanced employment probabilities associated with Foundation level apprenticeships. The analysis indicates that there are again strong positive employment outcomes associated with the possession of Foundation level apprenticeships. In aggregate, possession of this form of vocational training offers a 9.5 percentage point employment premium which compares to an enhanced likelihood of being employed of 5.3 percentage points for those holding a traditional trade apprenticeship.

Table 71: Marginal earnings returns to Foundation level apprenticeships – all			
	All	Males	Females
<i>Comparison</i>	Level 2/level 1 Qualifications		
Foundation Apprenticeship	0.095*** (0.016)	0.078*** (0.013)	0.086** (0.034)
Trade Apprenticeship	0.053*** (0.005)	0.058*** (0.005)	-0.019* (0.011)

Note: pooled Labour Force Survey data 2004-2009. Level 2/level 1: level 2 or level 1 vocational and/or academic qualifications as a maximum; * 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance.

Source: *London Economics*

When considering the impact of apprenticeships by gender, it appears to be the case that women in possession of Foundation level apprenticeships do relatively well. Compared to women in possession of Advanced level apprenticeships who achieve a relatively poor employment boost, this level of apprenticeship offers an employment boost to women that is in excess of the employment boost achieved by men (8.6 percentage points compared to 7.8 percentage points). In addition, the employment boost is significantly in excess of the employment boost associated with traditional apprenticeships, where the returns are actually negative. Interestingly, it appears to be the case the employment effect for women may be tied up with whether there are other vocational qualifications associated with possession of the Foundation level apprenticeship.

8 Returns to vocational education and training using the BCS70

8.1 Average gross wage returns

As part of the terms of reference to this project, we were asked to estimate the economic returns to vocational qualifications using a range of alternative data sources. In particular, we have made use of the British Cohort Study (BCS70), which consists of a panel of data containing personal and socio-economic information on over 17,000 individuals born during the week 5-11 April 1970 and followed-up at regular intervals throughout their lives. The analysis undertaken focuses on the survey waves undertaken at age 26, age 30 and age 34, with only individuals participating in all three waves included in the analysis. The total sample available thus consists of 6,457 individuals. However, as throughout the report, we exclude all individuals with either a school qualification above level 2 on the National Qualifications Framework or a vocational qualification above level 3 on the National Qualifications Framework. As such, each of the regression results is based on a considerably smaller sample (particularly when disaggregating by gender or by ability).

8.1.1 Average gross wage returns in 2000 and 2004

To provide some consistency with the results generated using the Labour Force Survey, we have presented in Table 72 the average gross earnings return associated with low level academic and vocational qualifications in 2000 when the cohort was aged 30. In Table 72, we have presented the equivalent information for the cohort in 2004 (aged 34). The full results containing all the coefficient estimates contained in the model are presented in Annex 3 for completeness. Note that information relating to gross wages was not available in 1996 and therefore to maintain comparability with the previous work undertaken by De Coulon *et al* (2007), we have also undertaken an analysis of the net earnings returns associated with academic and vocational qualifications using data from 1996, 2000 and 2004 (which is presented in Annex 3 of this report).

Table 72: Average gross wage returns, 2000

	Males and females		Males		Females	
	No controls	With controls	No controls	With controls	No controls	With controls
1 A-level	0.136*** (0.0403)	0.123*** (0.0456)	0.0959 (0.0634)	0.111 (0.0710)	0.169*** (0.0525)	0.141** (0.0600)
2 or 3 AS levels	-0.158 (0.140)	-0.210 (0.149)	-0.122 (0.211)	-0.150 (0.214)	-0.164 (0.186)	-0.261 (0.208)
1 AS level	-0.164** (0.0776)	-0.276*** (0.0920)	-0.227* (0.119)	-0.243** (0.124)	-0.102 (0.103)	-0.291** (0.143)
High GCSEs	0.260*** (0.0303)	0.143*** (0.0365)	0.282*** (0.0412)	0.156*** (0.0525)	0.226*** (0.0463)	0.102* (0.0535)
Low GCSEs	0.117*** (0.0269)	0.0546* (0.0312)	0.123*** (0.0350)	0.0713* (0.0422)	0.0958** (0.0424)	0.0278 (0.0476)
Other academic	0.0187 (0.0216)	0.00356 (0.0243)	-0.0143 (0.0345)	-0.0188 (0.0409)	0.0367 (0.0279)	0.0143 (0.0304)
RSA level 3	0.0254 (0.0498)	-0.0412 (0.0582)	-0.153 (0.260)	-0.226 (0.286)	0.0363 (0.0515)	-0.0513 (0.0593)
RSA level 2	0.00461 (0.0355)	0.0139 (0.0408)	0.00964 (0.129)	0.0283 (0.153)	-0.00280 (0.0380)	0.0120 (0.0428)
RSA level 1	-0.00334 (0.0248)	-0.00786 (0.0281)	0.0232 (0.0586)	0.0528 (0.0711)	-0.00937 (0.0280)	-0.0230 (0.0308)
C&G level 3	0.0145 (0.0315)	0.00408 (0.0353)	0.0212 (0.0371)	0.00685 (0.0431)	-0.0192 (0.0600)	-0.0369 (0.0649)
C&G level 2	0.00845 (0.0264)	0.0236 (0.0306)	0.0690** (0.0321)	0.108*** (0.0386)	-0.106** (0.0464)	-0.123** (0.0513)
C&G level 1	-0.00861 (0.0198)	0.0298 (0.0222)	0.0142 (0.0259)	0.0418 (0.0298)	-0.0211 (0.0315)	0.0307 (0.0349)
BTEC level 3	0.0196 (0.0357)	-0.00870 (0.0392)	0.0849* (0.0476)	0.101* (0.0543)	-0.0531 (0.0549)	-0.108* (0.0585)
BTEC level 2	-0.0433 (0.0598)	-0.0687 (0.0674)	-0.0762 (0.0873)	-0.147 (0.102)	-0.0140 (0.0824)	0.0222 (0.0910)
BTEC level 1	-0.0284 (0.0291)	-0.0101 (0.0322)	-0.0392 (0.0414)	-0.000848 (0.0488)	-0.0172 (0.0412)	-0.00761 (0.0438)
NVQ level 3	0.0219 (0.0442)	0.0199 (0.0489)	0.0577 (0.0598)	0.0372 (0.0717)	0.00751 (0.0661)	0.0339 (0.0673)
NVQ level 2	-0.0697** (0.0330)	-0.0611* (0.0368)	-0.0471 (0.0488)	-0.0535 (0.0547)	-0.0831* (0.0456)	-0.0666 (0.0506)
NVQ level 1	-0.0641* (0.0340)	-0.0394 (0.0383)	-0.103** (0.0510)	-0.116* (0.0603)	-0.0280 (0.0459)	0.0116 (0.0509)
Pitman level 3	0.0396 (0.0708)	0.0509 (0.0855)	-0.298 (0.261)	-0.401 (0.309)	0.0804 (0.0748)	0.111 (0.0893)
Pitman level 2	0.107* (0.0557)	0.0994 (0.0625)	0.274 (0.232)	0.605* (0.310)	0.110* (0.0582)	0.0785 (0.0639)
Pitman level 1	0.0571* (0.0317)	0.0652* (0.0367)	0.0455 (0.0991)	0.0826 (0.111)	0.0473 (0.0341)	0.0519 (0.0391)
Trade App	0.0979*** (0.0357)	0.0902** (0.0396)	0.0654* (0.0384)	0.0544 (0.0436)	0.106 (0.103)	0.120 (0.120)
Other vocational	0.0161 (0.0178)	0.00370 (0.0199)	0.0108 (0.0247)	0.0100 (0.0285)	0.0198 (0.0259)	0.00299 (0.0287)
N	2234	1731	1063	831	1171	900
Adjusted R ²	0.236	0.284	0.190	0.235	0.190	0.235

Source: London Economics using BCS dataset

The findings illustrate that in general there are relatively strong average earnings returns associated with academic qualifications, with the basic model specification estimating a 29.7% ($\beta = 0.260$) earnings premium for an individual holding 5 GCSEs at grades A* to C (or equivalent) compared to an individual without such GCSEs. There is some degree of variation depending on the gender of the recipient, with men achieving a 32.2% premium ($\beta = 0.280$) compared to a 25.9%

premium achieved by women ($\beta = 0.230$). Even with the inclusion of a range of personal, family and socio-economic characteristics, the earnings returns remain, with men posting a 16.9% premium ($\beta = 0.156$) compared to the 10.7% premium posted by women ($\beta = 0.102$). A very similar outcome is illustrated in Table 73 in relation to earnings information from 2004.

The results indicate that average returns are relatively varied with only a small number of qualifications associated with positive returns. In particular, men in possession of City & Guilds qualifications at level 2 achieve a 7.1% premium ($\beta = 0.069$) compared to men without such qualifications according to the baseline model specifications. This is estimated to increase to approximately 11% once family and socioeconomic characteristics are incorporated in the specification. Similarly, in 2000, men in possession of BTEC level 3 qualifications post positive returns; however, in both the case of the BTEC level 3 and City & Guilds level 2 qualifications, women post a statistically significant negative return at the age of 30 (and 34 in the case of City & Guilds level 2 qualifications).

Table 73: Average gross wage returns, 2004

	Males and females		Males		Females	
	No controls	With controls	No controls	With controls	No controls	With controls
1 A-level	0.108** (0.0440)	0.0491 (0.0502)	0.0617 (0.0672)	0.0451 (0.0760)	0.145** (0.0593)	0.0550 (0.0702)
2 or 3 AS levels	0.180 (0.136)	0.238 (0.157)	0.295* (0.178)	0.498** (0.234)	-0.0128 (0.217)	0.0500 (0.216)
1 AS level	-0.0806 (0.0831)	-0.0604 (0.0962)	-0.0794 (0.132)	-0.0358 (0.136)	-0.0564 (0.108)	-0.0434 (0.142)
High GCSEs	0.243*** (0.0322)	0.136*** (0.0395)	0.246*** (0.0456)	0.124** (0.0583)	0.246*** (0.0477)	0.133** (0.0582)
Low GCSEs	0.117*** (0.0284)	0.0701** (0.0336)	0.111*** (0.0385)	0.0708 (0.0468)	0.121*** (0.0434)	0.0668 (0.0511)
Other academic	-0.00584 (0.0242)	0.00398 (0.0279)	-0.0274 (0.0401)	-0.0844* (0.0490)	0.00465 (0.0305)	0.0508 (0.0346)
RSA level 3	-0.0490 (0.0574)	-0.0918 (0.0655)	-0.0452 (0.250)	-0.0600 (0.305)	-0.0505 (0.0583)	-0.107 (0.0658)
RSA level 2	0.0113 (0.0391)	0.0344 (0.0457)	-0.0283 (0.129)	-0.0650 (0.153)	0.0129 (0.0411)	0.0434 (0.0477)
RSA level 1	0.00482 (0.0268)	0.00356 (0.0308)	0.0118 (0.0610)	0.0480 (0.0730)	-0.00234 (0.0297)	-0.0216 (0.0339)
C&G level 3	0.00204 (0.0345)	0.0122 (0.0394)	-0.000811 (0.0424)	0.00324 (0.0493)	0.000272 (0.0658)	0.0273 (0.0759)
C&G level 2	-0.0294 (0.0284)	-0.0501 (0.0330)	0.00207 (0.0367)	-0.0152 (0.0431)	-0.0927** (0.0468)	-0.111** (0.0550)
C&G level 1	-0.00566 (0.0213)	0.0155 (0.0243)	0.0183 (0.0290)	0.0322 (0.0339)	-0.0384 (0.0326)	-0.0137 (0.0374)
BTEC level 3	0.101*** (0.0385)	0.0926** (0.0436)	0.112** (0.0554)	0.140** (0.0633)	0.101* (0.0551)	0.0710 (0.0630)
BTEC level 2	0.0483 (0.0594)	0.00423 (0.0681)	0.0334 (0.0940)	-0.0230 (0.109)	0.0464 (0.0776)	-0.00296 (0.0884)
BTEC level 1	-0.0484 (0.0323)	-0.0429 (0.0361)	-0.0615 (0.0476)	-0.00908 (0.0548)	-0.0541 (0.0449)	-0.0715 (0.0494)
NVQ level 3	0.0239 (0.0376)	0.0481 (0.0428)	0.0195 (0.0530)	0.0423 (0.0642)	0.0245 (0.0548)	0.0440 (0.0598)
NVQ level 2	-0.0620** (0.0309)	-0.0484 (0.0349)	-0.00201 (0.0473)	0.0240 (0.0530)	-0.117*** (0.0417)	-0.113** (0.0481)
NVQ level 1	-0.0527 (0.0326)	-0.0500 (0.0384)	-0.0874* (0.0479)	-0.0553 (0.0598)	-0.0161 (0.0453)	-0.0349 (0.0518)
Pitman level 3	0.104 (0.0760)	0.0421 (0.0918)	0.0781 (0.255)	0.0996 (0.337)	0.105 (0.0794)	0.0662 (0.0945)
Pitman level 2	-0.0417 (0.0575)	-0.0464 (0.0642)	0.0404 (0.231)	0.0847 (0.340)	-0.0369 (0.0587)	-0.0629 (0.0645)
Pitman level 1	0.0480 (0.0343)	0.0613 (0.0396)	0.0972 (0.106)	0.0661 (0.121)	0.0312 (0.0363)	0.0483 (0.0418)
Trade App	0.119*** (0.0404)	0.0893** (0.0454)	0.0950** (0.0441)	0.0771 (0.0503)	0.233* (0.141)	0.149 (0.186)
Other vocational	0.0105 (0.0184)	-0.0198 (0.0211)	-0.0186 (0.0260)	-0.0570* (0.0304)	0.0318 (0.0269)	0.00154 (0.0304)
N	1986	1534	982	760	1004	774
Adjusted R ²	0.282	0.317	0.173	0.254	0.258	0.281

Source: London Economics using BCS dataset

National Vocational Qualifications are associated with negative average earnings returns in a number of cases. The BCS70 data from 2000 suggests that men in possession of a NVQ level 1 qualification post a negative return of around 10% relative to a man in possession of no formally recognised qualifications, even when ability and family background are controlled for. Men in possession of NVQ level 2 qualifications are estimated to earn less than men in possession of no formally

recognised qualifications; however, these estimates are not statistically significant at the 5% level of confidence. Although women appear not to achieve any earnings return in 2000 (positive or negative), the analysis indicates that women in possession of a NVQ level 2 qualification earn approximately 12.0% less ($\beta=0.113$) than women in possession of no formally recognised qualifications in 2004.

The results do not provide consistent evidence regarding whether the negative wage premiums associated with low-level vocational qualifications identified in the LFS are due to ability bias. For some qualifications in some periods negative returns either disappear or become smaller once the additional control variables are added. However, in other cases the returns to low level qualifications appear to become worse after additional control variables are included. For instance, controlling for ability and family background leads to higher estimated returns associated with NVQs at levels 1-3 for men in 2004; however in 2000 the effect is in the opposite direction.

8.2 Employment returns

For completeness, we have also estimated the employment returns associated with different levels and types of academic and vocational qualification. The analysis presents the average employment returns to qualifications in 1996, 2000 and 2004 in Table 74, Table 75 and Table 76 respectively. Note that these returns are average effects; however, non linear regressions produce marginal impacts by definition, which accounts for the wording relating to 'marginal effects'.

As with the analysis using information from the Labour Force Survey, the BCS analysis appears to suggest that there are more consistent and positive employment effects associated with the acquisition of vocational qualifications.

Table 74 suggests that in aggregate, higher level vocational qualifications offer individuals strong positive employment effects. In particular, individuals in possession of RSA level 3, City & Guilds level 3, BTEC level 3 and NVQ level 3 qualifications were 4.9, 3.7, 5.5 and 2.9 percentage points more likely to be in employment relative to an individual in possession of no formally recognised qualifications. However, the positive employment effect associated with these vocational qualifications at level 3 is not replicated at level 2 and in some circumstances; individuals in possession of some vocational qualifications have lower employment probabilities than the comparison group. In particular, individuals in possession of NVQ level 2 and NVQ level 1 qualifications are approximately 7 to 8 percentage points less likely to be in employment, compared to an individual in possession of no formally recognised qualifications.

Table 74: Employment returns (marginal effects), 1996

	Males and females		Males		Females	
	No controls	With controls	No controls	With controls	No controls	With controls
1 A-level	-0.0614 (0.0380)	-0.0616 (0.0441)	-0.0180 (0.0436)	-0.0241 (0.0507)	-0.0840 (0.0549)	-0.0826 (0.0646)
2 or 3 AS levels	-0.0893 (0.122)	-0.0703 (0.134)	-0.173 (0.179)	-0.0840 (0.168)	-0.0116 (0.184)	-0.0290 (0.198)
1 AS level	0.0651 (0.0485)	0.0133 (0.0734)	-0.0504 (0.0991)	-0.0818 (0.119)	0.161*** (0.0439)	0.112 (0.0869)
High GCSEs	0.126*** (0.0153)	0.116*** (0.0195)	0.0582*** (0.0159)	0.0618*** (0.0182)	0.196*** (0.0247)	0.160*** (0.0330)
Low GCSEs	0.115*** (0.0196)	0.0988*** (0.0236)	0.0634*** (0.0205)	0.0551** (0.0236)	0.181*** (0.0323)	0.151*** (0.0394)
Other academic	0.0404** (0.0160)	0.0314* (0.0184)	0.0385** (0.0178)	0.0191 (0.0220)	0.0375 (0.0246)	0.0407 (0.0276)
RSA level 3	0.0643* (0.0335)	0.0490 (0.0421)			0.0616 (0.0499)	0.0400 (0.0617)
RSA level 2	0.0119 (0.0284)	0.0557** (0.0267)	-0.0553 (0.132)	-0.0530 (0.135)	0.00520 (0.0382)	0.0672* (0.0381)
RSA level 1	0.0207 (0.0192)	-0.00130 (0.0228)	-0.0225 (0.0441)	-0.0567 (0.0606)	0.0305 (0.0264)	0.00294 (0.0304)
C&G level 3	0.0246 (0.0264)	0.0365 (0.0280)	0.0131 (0.0239)	0.0157 (0.0248)	0.0120 (0.0531)	0.0686 (0.0498)
C&G level 2	0.0106 (0.0224)	-0.0121 (0.0277)	0.0237 (0.0191)	0.0243 (0.0207)	-0.0281 (0.0436)	-0.0916 (0.0570)
C&G level 1	0.00441 (0.0161)	-0.000855 (0.0183)	0.00408 (0.0166)	0.00362 (0.0181)	0.00287 (0.0265)	-0.0157 (0.0309)
BTEC level 3	0.0562** (0.0278)	0.0553* (0.0312)	0.00688 (0.0330)	0.0212 (0.0319)	0.108** (0.0424)	0.0924* (0.0512)
BTEC level 2	0.0535 (0.0426)	0.0461 (0.0481)	0.0517 (0.0392)	0.0153 (0.0696)	0.0605 (0.0654)	0.0770 (0.0672)
BTEC level 1	-0.00253 (0.0249)	-0.000839 (0.0277)	0.0384* (0.0215)	0.0310 (0.0238)	-0.0530 (0.0415)	-0.0459 (0.0463)
NVQ level 3	0.0418 (0.0466)	0.0290 (0.0545)	-0.0576 (0.0725)	-0.142 (0.112)	0.156*** (0.0489)	0.178*** (0.0385)
NVQ level 2	-0.0761* (0.0401)	-0.0727 (0.0457)	-0.176*** (0.0660)	-0.163** (0.0780)	0.0154 (0.0519)	-0.0115 (0.0629)
NVQ level 1	-0.0698* (0.0382)	-0.0714* (0.0434)	-0.0191 (0.0396)	-0.0269 (0.0461)	-0.126** (0.0605)	-0.117* (0.0677)
Pitman level 3	-0.0139 (0.0637)	-0.0236 (0.0796)			-0.0385 (0.0869)	-0.0899 (0.115)
Pitman level 2	0.0186 (0.0409)	0.00280 (0.0491)			0.0274 (0.0535)	0.0112 (0.0626)
Pitman level 1	-0.0149 (0.0266)	-0.00419 (0.0292)	-0.00647 (0.0732)	0.0376 (0.0472)	-0.0392 (0.0354)	-0.0275 (0.0397)
Trade App	0.0687** (0.0279)	0.0518 (0.0343)	0.0669*** (0.0164)	0.0532*** (0.0194)	-0.0877 (0.105)	-0.0932 (0.128)
Other vocational	0.0479*** (0.0153)	0.0357** (0.0178)	0.0379** (0.0156)	0.0188 (0.0181)	0.0477* (0.0253)	0.0417 (0.0292)
N	3756	2857	1589	1195	2155	1646

Source: London Economics using BCS dataset

Although these employment effects are replicated for the most-part in 2000 and 2004, the estimates relating to outcomes in 2000 (Table 75) do indicate that there are positive employment effects associated with possession of City & Guilds qualifications at level 2.

Table 75: Employment returns (marginal effects), 2000

	Males and females		Males		Females	
	No controls	With controls	No controls	With controls	No controls	With controls
1 A-level	-0.0121 (0.0337)	-0.00195 (0.0375)	-0.0527 (0.0523)	-0.0388 (0.0530)	-0.00747 (0.0554)	0.0146 (0.0627)
2 or 3 AS levels	0.0579 (0.0773)	-0.0153 (0.144)			-0.0249 (0.205)	-0.0932 (0.248)
1 AS level	0.0256 (0.0549)	-0.0868 (0.103)	0.00126 (0.0565)	-0.0246 (0.0775)	0.0789 (0.0864)	-0.149 (0.172)
High GCSEs	0.0834*** (0.0161)	0.0334 (0.0237)	0.0459*** (0.0106)	0.0168 (0.0154)	0.131*** (0.0317)	0.0627 (0.0447)
Low GCSEs	0.0994*** (0.0199)	0.0541** (0.0231)	0.0349** (0.0154)	0.00687 (0.0146)	0.171*** (0.0355)	0.121*** (0.0437)
Other academic	0.0139 (0.0166)	0.0269 (0.0182)	0.0246* (0.0128)	0.0241** (0.0116)	-0.00183 (0.0292)	0.0279 (0.0324)
RSA level 3	-0.0425 (0.0458)	-0.0204 (0.0510)			-0.0731 (0.0656)	-0.0315 (0.0758)
RSA level 2	0.0297 (0.0237)	0.0462* (0.0245)			0.0306 (0.0398)	0.0596 (0.0437)
RSA level 1	0.00214 (0.0185)	-0.0129 (0.0217)	-0.0677 (0.0478)	-0.0575 (0.0514)	0.0174 (0.0291)	-0.0144 (0.0338)
C&G level 3	-0.0194 (0.0309)	-0.00515 (0.0331)	-0.0319 (0.0253)	-0.0206 (0.0241)	0.0128 (0.0569)	0.0304 (0.0618)
C&G level 2	0.0453** (0.0196)	0.0376 (0.0235)	0.0242* (0.0128)	0.0171 (0.0131)	0.0500 (0.0414)	0.0373 (0.0510)
C&G level 1	-0.0207 (0.0168)	-0.0199 (0.0189)	0.0127 (0.0114)	0.0127 (0.0111)	-0.0586* (0.0309)	-0.0626* (0.0354)
BTEC level 3	0.0118 (0.0309)	0.00978 (0.0368)	-0.00554 (0.0321)	-0.0143 (0.0410)	0.0187 (0.0554)	0.0110 (0.0680)
BTEC level 2	-0.0251 (0.0531)	0.00397 (0.0557)			-0.0723 (0.0853)	-0.0122 (0.0929)
BTEC level 1	-0.00219 (0.0243)	0.0126 (0.0256)	0.00483 (0.0190)	0.00503 (0.0181)	-0.00740 (0.0428)	0.0314 (0.0454)
NVQ level 3	0.0223 (0.0367)	0.0375 (0.0378)	0.000934 (0.0275)	0.00246 (0.0264)	0.0642 (0.0695)	0.116* (0.0663)
NVQ level 2	-0.0102 (0.0263)	-0.0128 (0.0298)	-0.0187 (0.0256)	-0.0214 (0.0265)	-0.0119 (0.0456)	-0.0177 (0.0532)
NVQ level 1	-0.0566* (0.0305)	-0.0608* (0.0346)	-0.0553 (0.0357)	-0.0563 (0.0398)	-0.0458 (0.0472)	-0.0600 (0.0540)
Pitman level 3	0.00229 (0.0541)	-0.00123 (0.0673)			0.00473 (0.0827)	0.00652 (0.103)
Pitman level 2	-0.0159 (0.0445)	0.00286 (0.0455)			-0.0125 (0.0645)	0.0198 (0.0685)
Pitman level 1	0.0329 (0.0209)	0.0255 (0.0244)			0.0374 (0.0355)	0.0262 (0.0415)
Trade App	0.0329 (0.0323)	0.0215 (0.0388)	0.0228 (0.0154)	0.0103 (0.0193)	-0.0426 (0.0989)	-0.0809 (0.123)
Other vocational	0.0282** (0.0141)	0.0338** (0.0160)	0.0170 (0.0110)	0.0109 (0.0114)	0.0348 (0.0259)	0.0521* (0.0296)
N	3263	2484	1355	1021	1850	1404

Source: London Economics using BCS dataset

Table 76 may offer some indication that there is a timing effect associated with some of the vocational qualifications under consideration. In particular, the analysis indicates that the negative employment effect of NVQ level 2 qualifications in 1996 is actually estimated to be a positive effect in 2004, with individuals in possession of NVQ level 2 qualifications between 3 and 4 percentage points more likely to be

in employment relative to individuals in possession of no formally recognised qualifications. In addition, unlike the previous estimates, possession of a NVQ level 1 appears to have no statistically significant effect on the likelihood of being employed. One interesting feature of the analysis relates to the variation in employment outcomes by gender. Notably, in 2004 when the cohort were 34 years old, possession of NVQ level 2 qualifications enhance women's probability of being employed by approximately 9 percentage points, while the estimated effect for men is negligible and not statistically significant.

Table 76: Employment returns (marginal effects), 2004

	Males and females		Males		Females	
	No controls	With controls	No controls	With controls	No controls	With controls
1 A-level	-0.0426 (0.0391)	-0.0479 (0.0458)	-0.0572 (0.0521)	-0.0128 (0.0362)	-0.0556 (0.0629)	-0.106 (0.0783)
2 or 3 AS levels	0.0236 (0.0875)		-0.0428 (0.109)		0.148 (0.128)	
1 AS level	-0.0393 (0.0651)	-0.0803 (0.0894)			-0.129 (0.106)	-0.258* (0.142)
High GCSEs	0.0922*** (0.0166)	0.0623*** (0.0225)	0.0386*** (0.00901)	0.0222** (0.0107)	0.134*** (0.0347)	0.0914** (0.0461)
Low GCSEs	0.112*** (0.0210)	0.0852*** (0.0252)	0.0637*** (0.0171)	0.0352** (0.0168)	0.140*** (0.0367)	0.117** (0.0458)
Other academic	-0.000427 (0.0183)	0.00482 (0.0204)	0.0223** (0.0113)	0.0224** (0.00950)	-0.0194 (0.0314)	-0.0138 (0.0359)
RSA level 3	-0.0388 (0.0447)	0.0100 (0.0434)			-0.0728 (0.0653)	-0.0177 (0.0734)
RSA level 2	0.00373 (0.0276)	-0.00818 (0.0322)	-0.0815 (0.115)	-0.0567 (0.105)	0.00851 (0.0436)	-0.00589 (0.0503)
RSA level 1	0.0204 (0.0183)	0.0101 (0.0211)	-0.0369 (0.0347)	-0.0302 (0.0368)	0.0502* (0.0302)	0.0346 (0.0347)
C&G level 3	-0.0297 (0.0342)	-0.0429 (0.0392)	-0.0140 (0.0219)	-0.0334 (0.0278)	-0.0769 (0.0676)	-0.0733 (0.0760)
C&G level 2	0.0663*** (0.0194)	0.0686*** (0.0216)	0.0234** (0.0117)	0.0269*** (0.00996)	0.0948** (0.0405)	0.0928** (0.0472)
C&G level 1	-0.00579 (0.0169)	-0.0122 (0.0193)	0.000885 (0.0115)	0.0107 (0.0102)	-0.00103 (0.0305)	-0.0364 (0.0360)
BTEC level 3	-0.00252 (0.0340)	-0.0245 (0.0406)	-0.0519 (0.0381)	-0.0409 (0.0381)	0.0574 (0.0580)	0.0262 (0.0693)
BTEC level 2	0.105*** (0.0241)	0.108*** (0.0229)	-0.00216 (0.0427)	-0.0348 (0.0690)	0.221*** (0.0409)	0.243*** (0.0293)
BTEC level 1	0.0259 (0.0241)	0.0314 (0.0254)	0.0140 (0.0152)	0.0130 (0.0138)	0.0340 (0.0449)	0.0594 (0.0473)
NVQ level 3	0.0537** (0.0258)	0.0463* (0.0280)	-0.0125 (0.0263)	-0.0403 (0.0376)	0.125*** (0.0481)	0.119** (0.0512)
NVQ level 2	0.0369* (0.0208)	0.0332 (0.0237)	-0.00397 (0.0198)	-0.00234 (0.0181)	0.0851** (0.0362)	0.0861** (0.0416)
NVQ level 1	-0.0360 (0.0275)	-0.0367 (0.0314)	0.00150 (0.0190)	0.0105 (0.0153)	-0.0800* (0.0461)	-0.0914* (0.0532)
Pitman level 3	-0.00942 (0.0540)	0.0105 (0.0591)			-0.00502 (0.0815)	0.00866 (0.0977)
Pitman level 2	-0.0444 (0.0469)	-0.0450 (0.0526)			-0.0724 (0.0673)	-0.0732 (0.0770)
Pitman level 1	0.0329 (0.0212)	0.0259 (0.0247)	-0.0255 (0.0629)	-0.0523 (0.0790)	0.0512 (0.0357)	0.0435 (0.0415)
Trade App	0.0298 (0.0351)	0.00662 (0.0416)	0.00534 (0.0177)	-0.0117 (0.0222)	0.0156 (0.0993)	-0.0607 (0.128)
Other vocational	0.0198 (0.0142)	0.0214 (0.0161)	0.0151 (0.00981)	0.00548 (0.0100)	0.0147 (0.0261)	0.0451 (0.0295)
N	3047	2311	1327	1010	1700	1284

Source: London Economics using BCS dataset

As the estimated employment effect associated with NVQ level 2 qualifications was negative (although not statistically significant) for women in earlier years, this may suggest that the female return to work decision is significantly affected by possession of these qualifications or vice versa.

8.3 First difference estimates

Finally in this section, and following the approach of De Coulon *et al* (2007), we have undertaken a first difference analysis to assess whether the attainment of additional qualifications between the ages of 26 and 30 or 30 and 34 have any effect on the earnings growth achieved by those that have attained the qualifications later in life. The analysis covers the entire sample in Table 77 and a restricted sample of individuals of lower ability in Table 78 (based on achieving a maths score less than the sample median at age 10). Given the very small number of individuals undertaking additional qualifications later in life, some qualifications (particularly academic qualifications) are grouped together. Variables are included for level 1 and level 2 academic qualifications, and level 2 and level 3 vocational qualifications (including City & Guilds, RSAs, BTECs and Pitmans). The coefficients for these variables thus relate to the estimated effect on an individuals' change in wage of obtaining any of these qualifications for the first time.

It is important to note that the estimates presented here are not comparable with some of the other analyses in the field as a result of different model specifications. In particular, the model specification presented here controls for the fact that there may be earnings growth over the periods in question. If this effect is not controlled for (by including a constant in the model specification), then the estimates generated might suggest that any difference in earnings growth occurring over the period is as result of qualification attainment, where in fact it may simply be as a result of generalised earnings growth over the period²⁷. Therefore, it is crucial to ensure that when considering any analysis of the impact of the late attainment of qualifications on earnings, the full model specification is considered before deriving any conclusions.

The results for the analysis are relatively patchy, in part as a result of the limited sample sizes involved. Overall, the results show that few qualifications obtained over the specific timeframe have statistically significant effects on the change in the wage achieved, which reflects the relatively small numbers of individuals achieving each qualification. Where strong effects are found, for Pitman and BTEC level 1 qualifications (positive and negative respectively), these estimates are based on a very low number of individuals, and so should be treated with extreme caution.

Although there are some positive estimates (particularly for City & Guilds level 1 and NVQ level 3 qualifications), other results suggest that the rate of wage growth may be negatively affected by qualification attainment. In particular, NVQ level 1 qualifications are estimated to reduce the change in wage growth for women by between 6% and 7% over a four year period. One potential explanation for this may

²⁷ With generalised earnings growth, we would expect the average growth rate to be positive, whether or not an individual acquired a qualification during the period. If we use a model for earnings growth with a variable controlling for NVQ level 2 acquisition in the period and a constant, the coefficient associated to the constant represents the model intercept, i.e. the expected mean of the growth rate for the group of people with no additional qualification attainment over the period. Removing the constant term implies that we are assuming that the expected mean value for Y (earnings growth rate) is zero when X (acquisition of a NVQ level 2 qualification in this case) is 0 (the regression line goes through the origin); however with generalised earnings growth this is not likely to be the case.

be that employers are less likely to offer a wage increase while supporting individuals to complete a qualification.

Table 77: Effects of learning on change in net hourly wage at age 26-34

	Males and females		Males		Females	
	No controls	With controls	No controls	With controls	No controls	With controls
Δ Academic level 2	-0.0437 (0.0708)	-0.0535 (0.0681)	0.126* (0.0749)	0.135 (0.0897)	-0.0932 (0.0854)	-0.107 (0.0837)
Δ Academic level 1	-0.219 (0.329)	-0.235 (0.316)	0 (0)	0 (0)	-0.244 (0.320)	-0.281 (0.305)
Δ VRQ level 3	-0.0232 (0.0451)	-0.0205 (0.0454)	-0.00402 (0.0506)	0.000471 (0.0511)	-0.0341 (0.0718)	-0.0315 (0.0777)
Δ VRQ level 2	0.0448 (0.0513)	0.0474 (0.0485)	0.0461 (0.0668)	0.0437 (0.0683)	0.0440 (0.0799)	0.0511 (0.0738)
Δ Trade App	0.0720 (0.0503)	0.0668 (0.0500)	0.0685 (0.0585)	0.0720 (0.0584)	0.0936 (0.0754)	0.0615 (0.0759)
Δ NVQ level 3	0.0228 (0.0287)	0.0241 (0.0288)	0.0281 (0.0474)	0.0278 (0.0481)	0.0164 (0.0320)	0.00994 (0.0327)
Δ NVQ level 2	-0.0118 (0.0277)	-0.00850 (0.0273)	-0.0326 (0.0394)	-0.0314 (0.0388)	0.0130 (0.0385)	0.0198 (0.0383)
Δ NVQ level 1	-0.0234 (0.0366)	-0.0222 (0.0364)	0.0221 (0.0669)	0.0290 (0.0659)	-0.0679* (0.0378)	-0.0685* (0.0378)
Δ RSA level 1	-0.0488 (0.0528)	-0.0491 (0.0533)	-0.104 (0.0986)	-0.104 (0.0999)	-0.0404 (0.0636)	-0.0364 (0.0653)
Δ C&G level 1	0.0251 (0.0346)	0.0261 (0.0345)	0.0236 (0.0439)	0.0232 (0.0453)	0.0288 (0.0569)	0.0302 (0.0545)
Δ BTEC level 1	0.193*** (0.0413)	0.189*** (0.0412)	0.153*** (0.0540)	0.143*** (0.0525)	0.236*** (0.0451)	0.228*** (0.0464)
Δ Pitman level 1	-0.137*** (0.0398)	-0.125*** (0.0427)	-0.298*** (0.00997)	-0.283*** (0.0153)	-0.108*** (0.0276)	-0.0903** (0.0387)
Δ Other vocational	-0.000635 (0.0187)	0.00175 (0.0185)	0.00142 (0.0233)	0.00390 (0.0232)	-0.00889 (0.0310)	-0.00782 (0.0305)
Δ Married		-0.0215* (0.0112)		0.0116 (0.0157)		-0.0590*** (0.0160)
Δ Long-term illness		-0.0123 (0.0111)		-0.0101 (0.0153)		-0.0105 (0.0164)
Δ Part-time		0.0166 (0.0148)		0.0434 (0.0539)		0.0243 (0.0168)
Δ Experience		0.0193** (0.00753)		0.0236** (0.00944)		9.62e-06 (0.0132)
Δ No. children 0-5		-0.00204 (0.00993)		0.0140 (0.0122)		-0.0403** (0.0177)
Δ No. children 5-16		0.00379*** (0.000969)		0.00258 (0.00203)		0.00387*** (0.00113)
t3	0.0144 (0.00948)	-0.00833 (0.0119)	0.0418*** (0.0135)	0.0248 (0.0198)	-0.0170 (0.0135)	-0.0383** (0.0160)
Constant	0.219*** (0.00678)	0.0500 (0.0436)	0.210*** (0.00997)	0.0858 (0.0920)	0.229*** (0.00928)	0.0723 (0.0509)
N	3257	3257	1663	1663	1594	1594
Adjusted R ²	0.004	0.015	0.010	0.018	0.007	0.033

Note: VRQ includes BTECs, City & Guilds, RSA and Pitman qualifications.

Source: London Economics using BCS dataset

As Table 78 indicates, the results suggest that the benefits to qualification attainment may be higher amongst individuals of lower ability (based on maths scores at the age of 10). Although, as above, few results are statistically significant, a greater number of the estimated impacts are positive, which suggests that for these individuals qualification attainment may have led to faster wage growth.

Table 78: Effects of learning on change in net hourly wage at age 26-34 (low ability only)

	Males and females		Males		Females	
	No controls	With controls	No controls	With controls	No controls	With controls
Δ Academic level 2	-0.213 (0.140)	-0.223* (0.128)	0.0393*** (0.0142)	0.0493* (0.0274)	-0.300 (0.184)	-0.299* (0.167)
Δ Academic level 1	-0.304 (0.269)	-0.315 (0.247)	0 (0)	0 (0)	-0.348 (0.252)	-0.367* (0.221)
Δ VRQ level 3	-0.0336 (0.0582)	-0.0298 (0.0585)	0.0160 (0.0632)	0.0117 (0.0637)	-0.104 (0.0852)	-0.110 (0.0830)
Δ VRQ level 2	-0.0461 (0.0669)	-0.0458 (0.0646)	0.0393 (0.0864)	0.0374 (0.0903)	-0.189*** (0.0692)	-0.170** (0.0676)
Δ Trade App	0.146** (0.0695)	0.155** (0.0676)	0.100 (0.0751)	0.126* (0.0742)	0.276*** (0.0141)	0.257*** (0.0153)
Δ NVQ level 3	0.00646 (0.0397)	0.0113 (0.0402)	0.0337 (0.0725)	0.0390 (0.0742)	-0.00848 (0.0420)	-0.00641 (0.0409)
Δ NVQ level 2	0.0208 (0.0359)	0.0239 (0.0358)	0.0396 (0.0605)	0.0358 (0.0598)	0.0193 (0.0454)	0.0306 (0.0471)
Δ NVQ level 1	-0.00215 (0.0378)	0.00160 (0.0377)	0.0504 (0.0663)	0.0728 (0.0655)	-0.0298 (0.0450)	-0.0322 (0.0451)
Δ RSA level 1	0.0126 (0.0576)	0.00813 (0.0555)	-0.170** (0.0723)	-0.198*** (0.0746)	0.0372 (0.0684)	0.0260 (0.0616)
Δ C&G level 1	0.0315 (0.0605)	0.0361 (0.0608)	0.103 (0.0929)	0.120 (0.0996)	-0.0141 (0.0762)	-0.0140 (0.0782)
Δ BTEC level 1	0.234*** (0.0359)	0.231*** (0.0346)	0.217*** (0.0458)	0.206*** (0.0384)	0.252*** (0.0674)	0.250*** (0.0519)
Δ Pitman level 1	-0.181*** (0.0360)	-0.174*** (0.0417)	-0.290*** (0.0142)	-0.252*** (0.0225)	-0.140*** (0.0276)	-0.128*** (0.0441)
Δ Other vocational	0.00880 (0.0276)	0.0128 (0.0271)	-0.00551 (0.0321)	0.00206 (0.0320)	0.0203 (0.0517)	0.0284 (0.0489)
Δ Married		-0.0311** (0.0156)		0.0264 (0.0235)		-0.0811*** (0.0207)
Δ Long-term illness		-0.0266* (0.0161)		-0.00355 (0.0218)		-0.0463* (0.0240)
Δ Part-time		-0.00646 (0.0201)		0.0274 (0.0964)		0.00862 (0.0234)
Δ Experience		0.0318*** (0.0103)		0.0363*** (0.0125)		0.00953 (0.0188)
Δ No. children 0-5		0.00712 (0.0137)		0.00905 (0.0173)		-0.0171 (0.0230)
Δ No. children 5-16		0.00258* (0.00133)		0.00288 (0.00274)		0.00207 (0.00156)
t3	0.0200 (0.0133)	0.00555 (0.0163)	0.0435** (0.0196)	0.0308 (0.0273)	-0.00368 (0.0185)	-0.0211 (0.0216)
Constant	0.208*** (0.00953)	0.0934 (0.0602)	0.202*** (0.0142)	0.0591 (0.124)	0.215*** (0.0130)	0.140** (0.0709)
N	1636	1636	805	805	831	831
Adjusted R ²	0.010	0.023	0.016	0.033	0.016	0.047

Note: VRQ includes BTECs, City & Guilds, RSA and Pitman qualifications.

Source: London Economics using BCS dataset

9 Rates of return to vocational education and training

In this section, we provide an estimate of the individual rates of return associated with different levels and types of vocational qualifications.

9.1 Individual rates of return

In the three tables overleaf (Table 79 to Table 81), we provide summaries of the net present values and internal rates of return relating to each of the types and levels of vocational qualification. Due to small sample sizes, for some qualifications (RSA qualifications for men, and BTEC level 1 qualifications for both men and women), the estimates were not sufficiently robust and as such are not presented. Following discussions with the Department for Business, Innovation and Skills, in each case, we present a range of estimates, reflecting different assumptions relating to the proportion of the employment effect that is attributed to the particular qualification. This follows the approach of McIntosh (2007). The lower estimate reflects an assumption that 50% of the employment benefit is attributed to the qualification²⁸, while the higher estimate is based on an assumption that 100% of the employment gain is a result of obtaining the qualification. These are presented in black text.

In addition to this apportionment of the impact of qualification attainment on employment outcomes, throughout the presentation of results, we have also undertaken a sensitivity analysis to illustrate the impact on the net present value of the benefits of qualification attainment and the rate of return to the individual and Exchequer under two alternative scenarios. The first scenario assumes that the earnings premium associated with vocational qualification attainment is non-negative (presented in red), while the second scenario assumes that both the earnings premium and enhanced employment probabilities associated with vocational qualification attainment are non-negative (presented in green). We have presented these alternative scenarios as it has been suggested that the possession of any qualification cannot reduce either earnings or the probability of being employed relative to a *proper* counterfactual (i.e. the same individual without the qualification in question), and that negative earnings returns or reduced probabilities of being in employment must be as a result of fundamentally different characteristics between the treatment and control groups.

²⁸ This reflects the fact that a number of qualifications are offered in the workplace while in employment and as such the estimates relating to the impact of the qualification on employment outcomes may overestimate the true impact of the qualification. For this reason, we provide a range of estimates rather than assuming the entire employment effect is as a result of the qualification in question.

It is important to remember that the rate of return associated with the different qualifications is driven by the relationship between the costs and benefits associated with the particular qualification but also their timing. It is therefore possible for a qualification to be associated with an aggregate negative net present value but a (small) positive rate of return. In those cases where there appears to be a very high rate of return, this is generally as a result of the relatively insignificant costs associated with qualification attainment. This is especially the case in relation to the assessment of the individual rate of return for level 1 qualifications, where the opportunity cost associated with gaining these vocational qualifications is especially low due to the weak earnings and the relatively low probability of employment for those in the counterfactual group (i.e. those aged 17 with no formal qualifications). For City & Guilds level 1 qualifications, for instance, the estimated opportunity cost to the individual is approximately £310 once taxes and the probability of employment have been accounted for (for men and women combined). Amending these opportunity costs will (in general) have a relatively small impact on the net present value of the benefits associated with the qualifications, but a significant impact on the rate of return estimated by the model.

A second point to note is that the analysis presented here is based on an econometric approach rather than an *investment* approach. It is therefore possible that when considering the return to all individuals, the net present value of a particular qualification is not the weighted average of the net present values for men and women separately. If this outcome occurs, it does not imply that the analysis is incorrect, simply that either the econometric estimates of the earnings and/or employment returns for the entire sample for a particular qualification do not lie between the estimated returns for men and women separately. This can and does occur and is as a result of the model specifications and the interactions between the different variables when considering the entire sample rather than the samples disaggregated by gender.

9.1.1 Findings

Under the baseline assumptions, the analysis indicates that in general there are positive returns to individuals associated with vocational qualifications. For men and women combined, for example, compared to level 2 qualifications, level 3 qualifications are associated with a net present value of between £37,000 (for NVQ level 3) and approximately £88,000 (for City & Guilds level 3 qualifications). These estimates for the lifetime benefits are essentially unchanged under the alternative scenarios as there were no circumstances where level 3 qualifications were associated with negative earnings outcomes or reduced employment probabilities. Apprenticeships at level 3 offer an individual lifetime benefits of between £77,000 and £117,000 in present value terms (compared to level 2 qualifications).

Table 79: Individual rates of return associated with vocational qualification attainment (all)

		Apprenticeship	RSA	City & Guilds	BTEC	NVQ
Level 1	NPV Benefits	-	-	£36,254 - £60,840 £36,254 - £60,840 £36,254 - £60,840	-	£14,253 - £32,139 £18,034 - £36,207 £18,123 - £36,386
	Rate of return	-	-	305% - 543% 305% - 543% 305% - 543%	-	19% - 28% 38% - 51% 41% - 59%
Level 2	NPV Benefits	£48,324 - £74,387 £48,324 - £74,387 £48,324 - £74,387	-	£42,353 - £70,699 £42,618 - £70,991 £42,618 - £70,991	£35,138 - £56,571 £39,370 - £60,984 £40,938 - £64,120	£17,728 - £42,441 £24,466 - £49,814 £24,466 - £49,814
	Rate of return	50% - 69% 50% - 69% 50% - 69%	-	67% - 104% 72% - 110% 72% - 110%	49% - 71% 49% - 71% 51% - 74%	42% - 80% 46% - 83% 46% - 83%
Level 3	NPV Benefits	£76,990 - £117,337 £76,990 - £117,337 £76,990 - £117,337	-	£55,281 - £88,967 £55,281 - £88,967 £55,281 - £88,967	£44,906 - £63,801 £44,906 - £63,801 £44,906 - £63,801	£36,848 - £66,593 £36,848 - £66,593 £37,044 - £66,984
	Rate of return	67% - 86% 67% - 86% 67% - 86%	-	100% - 133% 100% - 133% 100% - 133%	57% - 78% 57% - 78% 57% - 78%	68% - 98% 68% - 98% 68% - 98%

Note: A “-” indicates that it was not possible to provide robust estimates of the NPV and IRR, due to small sample sizes or the rate of return could not be calculated, due the stream of future earnings being negative for every possible value of the discount rate.

Source: London Economics' analysis

For level 2 qualifications, under the baseline scenario, the lifetime benefits range between £17,000 (for NVQ qualifications) and £71,000 (for City & Guilds qualifications) compared to level 1 qualifications; however, the net benefit associated with an apprenticeship at level 2 again offers the greatest lifetime benefit (£48,000 to £74,000) compared to a level 1 qualification. Under both scenario 1 (where earnings premiums are non-negative) and scenario 2 (non-negative earnings and employment probabilities), the lifetime benefit associated with NVQ level 2 qualifications is increased by approximately £7,000 compared to a level 1 qualification.

For level 1 qualifications, the net benefits associated with City & Guilds qualifications range between £36,000 and £61,000 compared to no formally recognised qualifications, while the net benefits associated with NVQs remain positive (£14,000 to £32,000) compared to no formally recognised qualifications. Under both scenario 1 and scenario 2, lifetime benefits increase by approximately £4,000.

The benefits and rates of return to men only are presented in Table 80 overleaf. Again, relatively high returns are associated with all level 3 qualifications compared to level 2 qualifications. Apprenticeships achieve the highest benefits (of between £115,000 and £156,000) compared to level 2 qualifications; however the results for other vocational qualifications are also positive, with benefits between £26,000 (for NVQ level 3 qualifications) and almost £94,000 (for City & Guilds level 3

qualifications). The internal rates of return associated with these qualifications are also consistently high. With the exception of National Vocational Qualifications, the benefits associated with level 2 qualifications (compared to level 1) to men are more clustered than at level 3 (compared to level 2 qualifications). Apprenticeships and City & Guilds qualifications at level 2 are again estimated to provide substantial benefits compared to level 1 qualifications (between £55,000 and £78,000 and between £56,000 and £85,000 respectively); however the benefits from BTEC level 2 qualifications are marginally lower (between £15,000 and £20,000) compared to level 1 qualifications.

Table 80: Individual rates of return associated with vocational qualification attainment (male)

		Apprenticeship	RSA	City & Guilds	BTEC	NVQ
Level 1	NPV Benefits	-	-	£47,872 - £72,498 £47,872 - £72,498 £47,872 - £72,498	-	£1,711 - £8,038 £6,719 - £13,168 £8,434 - £16,597
	Rate of return	-	-	341% - 529% 341% - 529% 341% - 529%	-	5% - 8% 11% - 11% 22% - 29%
Level 2	NPV Benefits	£54,528 - £78,298 £54,528 - £78,298 £54,528 - £78,298	-	£56,030 - £85,363 £56,244 - £85,591 £56,244 - £85,591	£14,780 - £20,437 £20,054 - £25,780 £43,128 - £54,749	-£1,359 - £8,965 £10,532 - £21,120 £11,495 - £23,047
	Rate of return	49% - 64% 49% - 64% 49% - 64%	-	64% - 90% 67% - 94% 67% - 94%	20% - 27% 20% - 27% 36% - 36%	- 22% - 39% 23% - 40%
Level 3	NPV Benefits	£115,269 - £155,560 £115,269 - £155,560 £115,269 - £155,560	-	£65,375 - £93,973 £65,375 - £93,973 £65,375 - £93,973	£59,894 - £74,325 £59,894 - £74,325 £59,943 - £74,423	£25,949 - £36,574 £25,949 - £36,574 £26,817 - £38,310
	Rate of return	78% - 96% 78% - 96% 78% - 96%	-	87% - 110% 87% - 110% 87% - 110%	46% - 53% 46% - 53% 46% - 54%	63% - 83% 63% - 83% 63% - 83%

Note: A “-” indicates that it was not possible to provide robust estimates of the NPV and IRR, due to small sample sizes or the rate of return could not be calculated, due the stream of future earnings being negative for every possible value of the discount rate.

Source: London Economics' analysis

The net present value of the earnings stream associated with NVQ level 2 qualifications straddle zero for men under the baseline scenario, increasing by approximately £11,000 under scenario 1 and a further £1,000 to £2,000 under scenario 2.

Positive returns are associated with City & Guilds qualifications at level 1 compared to no formally recognised qualifications (between £48,000 and £72,000), while NVQ level 1 qualifications were again associated with low positive returns under the baseline scenario (between £2,000 and £8,000), although these returns increase by approximately £6,000 to £9,000 scenario 2.

Table 81 presents the net present values of the benefits and internal rates of return attained by women undertaking intermediate and low level vocational qualifications and apprenticeships. In particular, the returns for RSA level 3 qualifications (for which it was not possible to provide estimates for men due to small sample sizes) and NVQ level 3 qualifications are at higher levels compared to other vocational qualifications (between £25,000 and £61,000 compared to level 2 qualifications). Interestingly for women, the benefits associated with either apprenticeships or City

& Guilds qualifications at level 3 are also positive under the baseline scenario (between £6,000 and £22,000).

Women in possession of level 2 RSA and BTEC qualifications post the most significant returns (between £23,000 and £51,000 compared to level 1 qualifications); however, the lifetime net benefit associated with City & Guilds qualifications at level 2 are close to zero under the baseline scenario (£3,000 to £10,000). Even under scenario 2, where earnings premiums and enhanced employment probabilities are non-negative, lifetime earnings are still less than £10,000 compared to level 1 qualifications. A similar picture emerges when considering the lifetime benefits associated with level 1 qualifications compared to no formally recognised qualifications.

Table 81: Individual rates of return associated with vocational qualification attainment (female)

		Apprenticeship	RSA	City & Guilds	BTEC	NVQ
level 1	NPV Benefits	-	£43,880 - £76,392 £43,880 - £76,392 £43,880 - £76,392	£14,163 - £29,013 £16,016 - £31,183 £16,016 - £31,183	-	£15,070 - £32,516 £18,316 - £36,335 £18,316 - £36,335
	Rate of return	-	435% - 613% 435% - 613% 435% - 613%	295% - 682% 424% - 846% 424% - 846%	-	56% - 268% 289% - 582% 289% - 582%
level 2	NPV Benefits	£14,977 - £32,177 £14,977 - £32,177 £14,977 - £32,177	£31,756 - £51,374 £32,875 - £52,548 £32,929 - £52,656	£2,923 - £10,486 £8,187 - £16,207 £8,187 - £16,207	£22,524 - £44,416 £27,724 - £50,157 £27,783 - £50,276	£17,004 - £38,381 £21,284 - £43,335 £21,284 - £43,335
	Rate of return	24% - 42% 24% - 42% 24% - 42%	35% - 50% 50% - 69% 51% - 71%	11% - 76% 65% - 124% 65% - 124%	53% - 86% 61% - 96% 63% - 99%	62% - 118% 70% - 125% 70% - 125%
level 3	NPV Benefits	£6,476 - £12,489 £6,476 - £12,489 £6,476 - £12,489	£28,373 - £45,272 £28,662 - £45,598 £29,481 - £47,237	£11,046 - £21,974 £12,056 - £23,071 £12,056 - £23,071	£25,661 - £41,842 £25,698 - £41,885 £25,698 - £41,885	£31,170 - £61,193 £31,258 - £61,293 £31,258 - £61,293
	Rate of return	15% - 23% 15% - 23% 15% - 23%	91% - 119% 91% - 119% 91% - 119%	78% - 118% 80% - 119% 80% - 119%	67% - 100% 67% - 100% 67% - 100%	66% - 105% 67% - 106% 67% - 106%

Note: A “-” indicates that it was not possible to provide robust estimates of the NPV and IRR, due to small sample sizes or the rate of return could not be calculated, due the stream of future earnings being negative for every possible value of the discount rate.

Source: *London Economics' analysis*

9.2 Exchequer rates of return

In addition to the rates of return to individuals, we have also estimated the rates of return to the Exchequer, based on the up-front costs of supporting qualification attainment, and the change in tax revenues associated with qualification attainment.

Table 82 displays the results of the analysis for men and women combined. The Exchequer is estimated to achieve positive returns from the vast majority of vocational qualifications, with particularly high returns associated with level 3 qualifications. For these qualifications, compared to level 2 qualifications, the net present value of the benefits ranges from £21,000 to £36,000 for NVQ level 3 qualifications to £56,000 to £81,000 (for level 3 apprenticeships), with the internal

rate of return ranging from 20% to 29% for NVQ level 3 qualifications and between 27% and 33% for Advanced level apprenticeships. The benefits associated with level 1 and level 2 qualifications are also generally substantial, with the exception of the low positive returns associated with NVQ level 1 and level 2 qualifications (between £3,000 and £13,000 compared to no formally recognised qualifications and £4,000 and £17,000 compared to level 1 qualifications respectively). Under scenario 2, where earnings premiums and enhanced employment probabilities are non-negative, the net Exchequer cost associated with the provision of these qualifications increases by between £3,000 and £6,000 in present value terms.

Table 82: Exchequer rates of return associated with vocational qualification attainment (all)

		Apprenticeship	RSA	City & Guilds	BTEC	NVQ
level 1	NPV Benefits	-	-	£20,000 - £32,571 £20,000 - £32,571 £20,000 - £32,571	-	£3,768 - £13,272 £6,454 - £16,165 £6,483 - £16,223
	Rate of return	-	-	23% - 32% 23% - 32% 23% - 32%	-	6% - 10% 8% - 12% 8% - 12%
level 2	NPV Benefits	£31,484 - £47,540 £31,484 - £47,540 £31,484 - £47,540	-	£25,633 - £41,830 £25,936 - £42,149 £26,006 - £42,289	£19,748 - £32,154 £23,973 - £36,531 £24,884 - £38,351	£3,308 - £17,276 £8,995 - £23,513 £9,065 - £23,652
	Rate of return	14% - 18% 14% - 18% 14% - 18%	-	12% - 16% 13% - 17% 13% - 17%	11% - 15% 12% - 15% 12% - 15%	5% - 9% 7% - 11% 7% - 11%
level 3	NPV Benefits	£55,632 - £80,661 £55,632 - £80,661 £55,632 - £80,661	-	£29,654 - £47,748 £29,820 - £47,963 £29,895 - £48,113	£27,311 - £38,108 £27,478 - £38,323 £27,552 - £38,473	£20,514 - £36,355 £20,680 - £36,570 £20,878 - £36,965
	Rate of return	27% - 33% 27% - 33% 27% - 33%	-	13% - 18% 13% - 18% 13% - 18%	12% - 14% 12% - 14% 12% - 14%	20% - 29% 20% - 29% 20% - 29%

Note: A “-” indicates that it was not possible to provide robust estimates of the NPV and IRR, due to small sample sizes or the rate of return could not be calculated, due the stream of future earnings being negative for every possible value of the discount rate.

Source: London Economics' analysis

Similar Exchequer benefits are illustrated for qualifications attained by men, as shown in Table 83. The Exchequer benefits associated with City & Guilds qualifications and BTEC qualifications are greater than those estimated for men and women combined. At level 3, Advanced level apprenticeships provide a net Exchequer benefit of between £84,000 and £111,000 compared to level 2 qualifications, while City & Guilds and BTEC level 3 qualifications provide a net Exchequer benefit of between £39,000 and £53,000 compared to level 2 qualifications.

There are generally strong returns to the Exchequer from the provision of vocational qualifications at level 2, with the analysis demonstrating returns of between £34,000 and £49,000 for City & Guilds and between £33,000 and £48,000 for apprenticeships (compared to level 1 qualifications), equivalent to a rate of return of between 11% and 14%. However, the opposite is true for NVQs. In particular, the returns to NVQ level 2 qualifications are particularly low for men, ranging between -£11,000 and -£7,000 respectively compared to level 1 qualifications. Under scenario 2, the net Exchequer cost associated with the provision of NVQ level 2 qualifications stands at between £5,000 and £13,000. Similar outcomes are generated at level 1.

Table 83: Exchequer rates of return associated with vocational qualification attainment (Male)

		Apprenticeship	RSA	City & Guilds	BTEC	NVQ
level 1	NPV Benefits	-	-	£30,968 - £44,260 £30,968 - £44,260 £30,968 - £44,260	-	-£3,045 - £982 £1,189 - £5,326 £1,849 - £6,645
	Rate of return	-	-	30% - 40% 30% - 40% 30% - 40%	-	- 4% - 6% 5% - 7%
level 2	NPV Benefits	£32,969 - £47,692 £32,969 - £47,692 £32,969 - £47,692	-	£34,489 - £49,177 £37,040 - £51,723 £39,694 - £57,030	£9,917 - £14,284 £17,913 - £22,382 £35,354 - £43,859	-£11,273 - -£6,833 £2,321 - £7,023 £5,422 - £13,225
	Rate of return	11% - 14% 11% - 14% 11% - 14%	-	13% - 16% 14% - 16% 16% - 19%	7% - 9% 9% - 11% 13% - 14%	- 4% - 6% 6% - 8%
level 3	NPV Benefits	£84,432 - £111,101 £84,432 - £111,101 £84,432 - £111,101	-	£38,614 - £52,657 £40,106 - £54,130 £42,353 - £58,624	£40,369 - £46,903 £41,861 - £48,377 £44,125 - £52,906	£14,940 - £18,542 £16,432 - £20,016 £19,225 - £25,602
	Rate of return	19% - 22% 19% - 22% 19% - 22%	-	14% - 17% 15% - 17% 16% - 19%	13% - 14% 13% - 14% 14% - 16%	20% - 23% 21% - 23% 24% - 29%

Note: A “-” indicates that it was not possible to provide robust estimates of the NPV and IRR, due to small sample sizes or the rate of return could not be calculated, due the stream of future earnings being negative for every possible value of the discount rate.

Source: *London Economics' analysis*

Table 84 presents the returns to the Exchequer associated with qualification attainment by women. The results find that the returns are positive for most qualifications, although lower at times than those associated with attainment by men.

Table 84: Exchequer rates of return associated with vocational qualification attainment (Female)

		Apprenticeship	RSA	City & Guilds	BTEC	NVQ
level 1	NPV Benefits	-	£21,618 - £37,128 £21,618 - £37,128 £21,618 - £37,128	£3,923 - £10,441 £5,218 - £11,958 £5,218 - £11,958	-	£3,002 - £10,865 £5,270 - £13,533 £5,270 - £13,533
	Rate of return	-	32% - 45% 32% - 45% 32% - 45%	9% - 16% 11% - 20% 11% - 20%	-	6% - 11% 8% - 13% 8% - 13%
level 2	NPV Benefits	£1,231 - £10,144 £1,231 - £10,144 £1,231 - £10,144	£15,506 - £26,137 £16,315 - £26,986 £16,334 - £27,024	-£3,380 - £938 £162 - £4,785 £166 - £4,792	£7,994 - £19,301 £11,535 - £23,209 £11,555 - £23,250	£1,595 - £12,145 £4,492 - £15,492 £4,496 - £15,499
	Rate of return	4% - 9% 4% - 9% 4% - 9%	10% - 13% 11% - 14% 11% - 14%	- 4% - 7% 4% - 7%	8% - 13% 9% - 14% 9% - 14%	4% - 8% 6% - 10% 6% - 10%
level 3	NPV Benefits	£348 - £3,460 £348 - £3,460 £348 - £3,460	£9,584 - £18,099 £9,785 - £18,327 £10,224 - £19,205	-£1,885 - £3,507 -£1,179 - £4,271 -£1,127 - £4,375	£6,765 - £14,746 £6,818 - £14,805 £6,870 - £14,910	£13,661 - £27,903 £13,736 - £27,988 £13,788 - £28,093
	Rate of return	4% - 7% 4% - 7% 4% - 7%	8% - 12% 8% - 12% 9% - 12%	2% - 6% 3% - 7% 3% - 7%	7% - 11% 7% - 11% 7% - 11%	16% - 25% 16% - 25% 16% - 25%

Note: A “-” indicates that it was not possible to provide robust estimates of the NPV and IRR, due to small sample sizes or the rate of return could not be calculated, due the stream of future earnings being negative for every possible value of the discount rate.

Source: London Economics' analysis

As with the individual returns (reported previously), the net present value associated with City & Guilds, NVQs and apprenticeship qualifications acquired by women is particularly small, with some negative estimates associated with NVQs and City & Guilds qualifications at level 1 and level 2 compared to the next highest level of qualification (and level 3 in the case of City & Guilds). Even under the alternative scenarios, the net Exchequer benefit from providing these qualifications continues to be relatively modest. The only qualification offering consistently positive Exchequer returns are RSA qualifications that provide a benefit of between £21,000 and £37,000 at level 1 (compared to no formally recognised qualifications), between £15,000 to £26,000 at level 2 (compared to level 1 qualifications) and between £10,000 to £18,000 at level 3 (compared to level 2 qualifications). BTEC qualifications and apprenticeships at level 3 deliver an Exchequer benefit of between zero and £18,000 depending on the level of qualification (compared to level 2 qualifications).

10 References

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Annex 1 Average employment returns to qualifications

Table 85: Average employment returns to academic and vocational qualifications– all

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Pooled
1+ A level	0.0436** (0.0183)	0.0422** (0.0179)	0.0213 (0.0146)	0.0493*** (0.0137)	0.0377*** (0.0141)	0.0214 (0.0157)	0.0167 (0.0144)	0.0271* (0.0145)	0.0187 (0.0173)	0.00989 (0.0174)	0.0304** (0.0154)	0.0124 (0.0148)	0.0226 (0.0144)	0.0443*** (0.0151)	0.0292*** (0.00410)
1+ AS level	0.193*** (0.0500)	0.0434 (0.0957)	0.0562 (0.0666)	0.0428 (0.0696)	0.0579 (0.0601)	0.000928 (0.0642)	0.0999** (0.0406)	0.0578 (0.0426)	0.114*** (0.0392)	0.0561 (0.0400)	0.0983*** (0.0315)	0.117*** (0.0289)	0.0126 (0.0347)	0.101*** (0.0304)	0.0723*** (0.0117)
5+ GCSEs A*-C	0.140*** (0.00659)	0.154*** (0.00699)	0.142*** (0.00553)	0.132*** (0.00568)	0.135*** (0.00570)	0.135*** (0.00630)	0.143*** (0.00541)	0.138*** (0.00551)	0.146*** (0.00641)	0.152*** (0.00652)	0.147*** (0.00601)	0.139*** (0.00570)	0.145*** (0.00567)	0.154*** (0.00624)	0.143*** (0.00159)
4- GCSEs A*-C	0.0999*** (0.00635)	0.116*** (0.00660)	0.112*** (0.00539)	0.106*** (0.00546)	0.109*** (0.00554)	0.109*** (0.00612)	0.106*** (0.00549)	0.111*** (0.00546)	0.107*** (0.00630)	0.115*** (0.00649)	0.109*** (0.00591)	0.112*** (0.00559)	0.116*** (0.00563)	0.107*** (0.00623)	0.110*** (0.00156)
1+ GCSEs A*-G	0.0757*** (0.00926)	0.0913*** (0.00899)	0.0848*** (0.00715)	0.0915*** (0.00727)	0.0835*** (0.00755)	0.0873*** (0.00817)	0.0916*** (0.00719)	0.0888*** (0.00718)	0.0597*** (0.00978)	0.0854*** (0.00944)	0.0654*** (0.00905)	0.0732*** (0.00837)	0.0754*** (0.00828)	0.0838*** (0.00883)	0.0838*** (0.00218)
RSA level 3	0.0617 (0.0447)	0.0949** (0.0470)	-0.00743 (0.0476)	0.0604 (0.0445)	0.172*** (0.0368)	0.0567 (0.0525)	0.107** (0.0428)	-0.0175 (0.0634)	0.104** (0.0495)	0.0626 (0.0791)	-0.0428 (0.0745)	0.0742 (0.0598)	-0.122 (0.0846)	-0.0545 (0.0813)	0.0506*** (0.0146)
RSA level 2	-0.0340 (0.0403)	0.0322 (0.0497)	-0.0130 (0.0443)	0.0233 (0.0502)	0.0713* (0.0408)	0.0164 (0.0450)	0.0113 (0.0401)	-0.0354 (0.0522)	0.0751 (0.0472)	0.0531 (0.0494)	0.104** (0.0419)	0.0643 (0.0461)	-0.0260 (0.0490)	0.0212 (0.0534)	0.0202 (0.0125)
RSA level 1	0.0618*** (0.00936)	0.0642*** (0.0100)	0.0568*** (0.00817)	0.0574*** (0.00835)	0.0572*** (0.00862)	0.0469*** (0.00974)	0.0521*** (0.00883)	0.0493*** (0.00935)	0.0658*** (0.0110)	0.0358*** (0.0126)	0.0358*** (0.0123)	0.0659*** (0.0115)	0.0360*** (0.0126)	0.0583*** (0.0140)	0.0545*** (0.00267)
C&G level 3	0.121*** (0.0130)	0.0899*** (0.0144)	0.105*** (0.0108)	0.0688*** (0.0110)	0.0871*** (0.0107)	0.0944*** (0.0113)	0.0801*** (0.0103)	0.0932*** (0.0104)	0.0987*** (0.0120)	0.0763*** (0.0130)	0.100*** (0.0119)	0.0681*** (0.0118)	0.0801*** (0.0118)	0.0800*** (0.0130)	0.0895*** (0.00312)
C&G level 2	0.108*** (0.0109)	0.0607*** (0.0125)	0.0513*** (0.0112)	0.0428*** (0.0118)	0.0413*** (0.0126)	0.0389*** (0.0140)	0.0519*** (0.0123)	0.0665*** (0.0124)	0.0740*** (0.0154)	0.0288* (0.0166)	0.0491*** (0.0147)	0.0478*** (0.0148)	0.0340** (0.0151)	0.0211 (0.0164)	0.0532*** (0.00354)
C&G level 1	0.0430*** (0.0118)	-0.00685 (0.0161)	0.000420 (0.0155)	-0.00953 (0.0170)	-0.0108 (0.0164)	-0.0609*** (0.0189)	-0.0394** (0.0163)	0.00127 (0.0164)	-0.0193 (0.0205)	-0.0175 (0.0224)	-0.00873 (0.0210)	-0.0355* (0.0205)	-0.00631 (0.0206)	-0.0245 (0.0228)	-0.00857* (0.00466)
BTEC level 3	0.0946*** (0.0149)	0.0977*** (0.0164)	0.0805*** (0.0136)	0.0831*** (0.0131)	0.0689*** (0.0142)	0.0877*** (0.0149)	0.0432*** (0.0140)	0.0557*** (0.0141)	0.0504*** (0.0171)	0.0777*** (0.0166)	0.0651*** (0.0163)	0.0511*** (0.0150)	0.0653*** (0.0147)	0.0450*** (0.0161)	0.0668*** (0.00401)
BTEC level 2	0.0827*** (0.0300)	0.0194 (0.0373)	0.0674** (0.0268)	0.0634* (0.0375)	0.0824** (0.0370)	0.122*** (0.0346)	-0.0302 (0.0412)	0.0380 (0.0378)	0.0572 (0.0377)	0.0380 (0.0398)	0.00923 (0.0390)	0.0271 (0.0346)	-0.0286 (0.0310)	-0.0175 (0.0313)	0.0278*** (0.00954)
BTEC level 1	0.109*** (0.0313)	0.0999*** (0.0370)	0.101*** (0.0289)	0.0929*** (0.0292)	0.0749** (0.0351)	-0.0412 (0.0417)	0.00473 (0.0384)	0.0810** (0.0340)	0.0106 (0.0480)	0.0412 (0.0510)	0.0471 (0.0477)	0.00402 (0.0439)	0.0129 (0.0392)	-0.0571 (0.0407)	0.0419*** (0.0103)

Table 85: Average employment returns to academic and vocational qualifications– all

NVQ level 3	0.0844*** (0.0229)	0.109*** (0.0235)	0.126*** (0.0147)	0.121*** (0.0133)	0.156*** (0.0113)	0.142*** (0.0119)	0.112*** (0.0111)	0.122*** (0.0105)	0.152*** (0.0105)	0.139*** (0.0110)	0.0639** (0.0324)	0.123*** (0.00924)	0.130*** (0.00913)	0.108*** (0.0104)	0.125*** (0.00325)
NVQ level 2	0.0509*** (0.0159)	0.0127 (0.0172)	0.0479*** (0.0124)	0.0623*** (0.0114)	0.0731*** (0.0107)	0.0849*** (0.0107)	0.0798*** (0.00941)	0.0810*** (0.00950)	0.0878*** (0.0106)	0.0861*** (0.0104)	0.0987*** (0.00902)	0.0844*** (0.00836)	0.0931*** (0.00827)	0.0901*** (0.00872)	0.0747*** (0.00274)
NVQ level 1	-0.0625** (0.0292)	-0.00117 (0.0288)	0.0271 (0.0195)	-0.0403* (0.0217)	-0.00877 (0.0194)	0.00896 (0.0202)	0.0186 (0.0175)	0.00379 (0.0174)	0.0551*** (0.0172)	-0.0131 (0.0212)	0.0144 (0.0178)	-0.0491*** (0.0148)	-0.0629*** (0.0136)	-0.0393*** (0.0135)	-0.0188*** (0.00482)
Trade App	0.0904*** (0.0155)	0.0833*** (0.0149)	0.0524*** (0.0141)	0.0548*** (0.0141)	0.0784*** (0.0129)	0.0680*** (0.0148)	0.0297** (0.0146)	0.0512*** (0.0141)	0.0814*** (0.0156)	0.0620*** (0.0178)	0.0672*** (0.0167)	0.0656** (0.0321)	0.0568** (0.0264)	0.0615** (0.0279)	0.0616** (0.00433)
Other	0.0896*** (0.00528)	0.105*** (0.00533)	0.0924*** (0.00444)	0.0895*** (0.00453)	0.0983*** (0.00462)	0.0824*** (0.00530)	0.0925*** (0.00463)	0.104*** (0.00467)	0.0953*** (0.00570)	0.0923*** (0.00592)	0.110*** (0.00524)	0.106*** (0.00500)	0.105*** (0.00504)	0.107*** (0.00549)	0.0968*** (0.00134)
Voc (L D/K)	0.0745*** (0.0129)	0.0813*** (0.0114)	0.0679*** (0.00847)	0.0783*** (0.00831)	0.0921*** (0.00834)	0.0781*** (0.00944)	0.0901*** (0.00813)	0.0794*** (0.00813)	0.0934*** (0.00970)	0.0841*** (0.00997)	0.101*** (0.00866)	0.0829*** (0.00852)	0.0784*** (0.00887)	0.0727*** (0.00954)	0.0831*** (0.00244)
N	34,164	36,171	47,124	45,231	43,151	33,904	43,395	41,703	29,633	26,793	35,200	35,867	34,765	31,701	518,802

Note: Aggregated average returns to vocational qualifications – pooled Labour Force Survey data 1996-2009

* 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance.

Source: London Economics

Table 86: Average employment returns to academic and vocational qualifications– males

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Pooled
1+ A level	0.0206 (0.0264)	0.0302 (0.0257)	-0.00410 (0.0208)	0.0189 (0.0196)	0.0347* (0.0192)	0.0156 (0.0224)	0.0310 (0.0192)	0.00152 (0.0208)	0.0227 (0.0228)	0.00403 (0.0244)	0.0225 (0.0202)	-0.0183 (0.0211)	0.0144 (0.0191)	0.0239 (0.0210)	0.0168*** (0.00569)
1+ AS level	0.135* (0.0770)	0.0524 (0.150)	-0.0699 (0.110)	0.148*** (0.0558)	0.0543 (0.0969)	0.0561 (0.0938)	0.0248 (0.0759)	0.0398 (0.0511)	0.0740 (0.0468)	0.0565 (0.0502)	0.0961*** (0.0354)	0.0574 (0.0438)	-0.0605 (0.0538)	0.0730* (0.0412)	0.0382** (0.0164)
5+ GCSEs A*-C	0.121*** (0.00811)	0.132*** (0.00899)	0.116*** (0.00686)	0.111*** (0.00704)	0.106*** (0.00736)	0.0960*** (0.00807)	0.114*** (0.00670)	0.114*** (0.00684)	0.109*** (0.00801)	0.115*** (0.00813)	0.0992*** (0.00788)	0.114*** (0.00702)	0.102*** (0.00737)	0.118*** (0.00825)	0.112*** (0.00202)
4- GCSEs A*-C	0.0967*** (0.00805)	0.104*** (0.00841)	0.106*** (0.00663)	0.103*** (0.00662)	0.0961*** (0.00692)	0.0958*** (0.00755)	0.0881*** (0.00681)	0.0996*** (0.00671)	0.0893*** (0.00778)	0.0877*** (0.00794)	0.0903*** (0.00731)	0.0915*** (0.00684)	0.0862*** (0.00708)	0.0847*** (0.00812)	0.0950*** (0.00195)
1+ GCSEs A*-G	0.0862*** (0.0110)	0.0846*** (0.0112)	0.0969*** (0.00833)	0.0943*** (0.00846)	0.0791*** (0.00920)	0.0732*** (0.00993)	0.0823*** (0.00862)	0.0753*** (0.00874)	0.0365*** (0.0124)	0.0755*** (0.0112)	0.0576*** (0.0111)	0.0680*** (0.0100)	0.0656*** (0.0103)	0.0702*** (0.0113)	0.0776*** (0.00265)
RSA level 3		-0.0396 (0.130)	-0.274** (0.139)	-0.204 (0.155)		-0.221 (0.186)		-0.177 (0.276)						-0.497*** (0.186)	-0.0385 (0.0528)
RSA level 2	-0.265** (0.106)	-0.172 (0.164)	-0.198 (0.147)	-0.0707 (0.136)	-0.0650 (0.116)	-0.294** (0.145)	0.0264 (0.102)	-0.203 (0.133)	-0.630*** (0.187)	0.0618 (0.128)		-0.0344 (0.197)	-0.139 (0.104)	0.0999 (0.125)	-0.124*** (0.0378)
RSA level 1	-0.0391 (0.0356)	0.00141 (0.0372)	-0.137*** (0.0352)	-0.0204 (0.0311)	-0.0440 (0.0332)	-0.0681* (0.0352)	-0.0288 (0.0316)	-0.161*** (0.0398)	-0.00599 (0.0387)	-0.0574 (0.0514)	-0.0925* (0.0497)	-0.0439 (0.0500)	-0.121** (0.0561)	-0.116* (0.0601)	-0.0649*** (0.0106)
C&G level 3	0.103*** (0.0119)	0.0830*** (0.0132)	0.109*** (0.00921)	0.0694*** (0.00983)	0.0828*** (0.00962)	0.0970*** (0.00966)	0.0830*** (0.00886)	0.0837*** (0.00930)	0.0910*** (0.0104)	0.0776*** (0.0112)	0.0926*** (0.0104)	0.0763*** (0.0101)	0.0807*** (0.0104)	0.0887*** (0.0119)	0.0876*** (0.00276)
C&G level 2	0.101*** (0.0101)	0.0750*** (0.0122)	0.0545*** (0.0107)	0.0537*** (0.0112)	0.0535*** (0.0121)	0.0469*** (0.0138)	0.0606*** (0.0113)	0.0785*** (0.0112)	0.0760*** (0.0143)	0.0293* (0.0163)	0.0630*** (0.0139)	0.0433*** (0.0144)	0.0323** (0.0150)	0.0402** (0.0162)	0.0609*** (0.00336)
C&G level 1	0.0363*** (0.0131)	-0.00175 (0.0182)	0.00228 (0.0180)	-0.000541 (0.0204)	0.00400 (0.0185)	-0.0397* (0.0224)	-0.0421** (0.0202)	-0.00767 (0.0191)	-0.0245 (0.0243)	0.0271 (0.0249)	0.0128 (0.0243)	0.00455 (0.0230)	-0.0109 (0.0234)	-0.00780 (0.0278)	-0.000601 (0.00538)
BTEC level 3	0.0752*** (0.0161)	0.0900*** (0.0182)	0.0383** (0.0160)	0.0521*** (0.0154)	0.0648*** (0.0161)	0.0712*** (0.0163)	0.0495*** (0.0157)	0.0181 (0.0180)	0.0438** (0.0194)	0.0650*** (0.0184)	0.0473** (0.0194)	0.0172 (0.0192)	0.0469** (0.0186)	0.0267 (0.0202)	0.0490*** (0.00469)
BTEC level 2	0.0280 (0.0479)	-0.00210 (0.0520)	0.0619* (0.0362)	0.0488 (0.0670)	0.0350 (0.0520)	0.0688 (0.0605)	-0.0508 (0.0590)	0.0538 (0.0496)	0.0561 (0.0551)	0.0646 (0.0479)	-0.0803 (0.0579)	0.00812 (0.0471)	-0.0369 (0.0461)	-0.0105 (0.0429)	0.00289 (0.0140)
BTEC level 1	0.0780* (0.0412)	0.115*** (0.0422)	0.111*** (0.0327)	0.141*** (0.0315)	0.0384 (0.0495)	0.00106 (0.0531)	0.0606 (0.0454)	0.0828* (0.0426)	0.00470 (0.0694)	0.0412 (0.0716)	0.102** (0.0518)	-0.0370 (0.0662)	-0.0240 (0.0579)	-0.119* (0.0626)	0.0440*** (0.0137)
NVQ level 3	0.0127 (0.0315)	-0.0268 (0.0380)	0.0636*** (0.0227)	0.0621*** (0.0202)	0.0739*** (0.0175)	0.0741*** (0.0181)	0.0567*** (0.0170)	0.0550*** (0.0166)	0.0898*** (0.0165)	0.109*** (0.0150)	0.110*** (0.0374)	0.0807*** (0.0138)	0.0785*** (0.0143)	0.0626*** (0.0167)	0.0706*** (0.00496)
NVQ level 2	-0.0540** (0.0251)	-0.108*** (0.0281)	-0.0733*** (0.0207)	-0.0323* (0.0185)	0.0144 (0.0165)	0.0131 (0.0177)	0.0168 (0.0147)	0.0230 (0.0150)	0.0472*** (0.0170)	0.0417** (0.0164)	0.0373** (0.0147)	0.0382*** (0.0131)	0.0602*** (0.0125)	0.0407*** (0.0140)	0.0133*** (0.00437)
NVQ level 1	-0.157*** (0.0420)	-0.0788* (0.0416)	-0.0570* (0.0301)	-0.110*** (0.0329)	-0.0513* (0.0278)	-0.0801** (0.0312)	-0.0263 (0.0252)	-0.0533** (0.0266)	0.0232 (0.0252)	-0.0594* (0.0315)	-0.00522 (0.0255)	-0.0742*** (0.0216)	-0.0644*** (0.0196)	-0.0449** (0.0210)	-0.0529*** (0.00704)
Trade App	0.0757*** (0.0144)	0.0975*** (0.0133)	0.0543*** (0.0126)	0.0598*** (0.0125)	0.0825*** (0.0109)	0.0732*** (0.0126)	0.0398*** (0.0128)	0.0598*** (0.0123)	0.0816*** (0.0125)	0.0682*** (0.0148)	0.0670*** (0.0145)	0.0643** (0.0266)	0.0534** (0.0231)	0.0521** (0.0261)	0.0647*** (0.00380)

Table 86: Average employment returns to academic and vocational qualifications– males

Other	0.0774***	0.0991***	0.0893***	0.0834***	0.0885***	0.0707***	0.0794***	0.0882***	0.0826***	0.0813***	0.0978***	0.0989***	0.0908***	0.0962***	0.0868***
	(0.00670)	(0.00674)	(0.00555)	(0.00565)	(0.00579)	(0.00652)	(0.00571)	(0.00580)	(0.00690)	(0.00718)	(0.00642)	(0.00603)	(0.00618)	(0.00696)	(0.00166)
Voc (L D/K)	0.0736***	0.0914***	0.0716***	0.0791***	0.0819***	0.0826***	0.0932***	0.0798***	0.0905***	0.0717***	0.104***	0.0945***	0.0609***	0.0734***	0.0830***
	(0.0139)	(0.0125)	(0.00913)	(0.00891)	(0.00922)	(0.0102)	(0.00846)	(0.00870)	(0.00998)	(0.0107)	(0.00892)	(0.00861)	(0.00987)	(0.0107)	(0.00262)
N	16,874	17,989	23,413	22,456	21,544	16,988	21,723	20,972	14,961	13,592	18,128	18,492	18,057	16,517	261,744

Note: Aggregated average returns to vocational qualifications – pooled Labour Force Survey data 1996-2009

* 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance.

Source: *London Economics*

Table 87: Average employment returns to academic and vocational qualifications– females

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Pooled
1+ A level	0.0600** (0.0256)	0.0524** (0.0247)	0.0347* (0.0205)	0.0721*** (0.0194)	0.0413** (0.0202)	0.0228 (0.0218)	0.00714 (0.0205)	0.0513** (0.0202)	0.0178 (0.0252)	0.0154 (0.0245)	0.0367 (0.0226)	0.0322 (0.0209)	0.0344 (0.0213)	0.0623*** (0.0219)	0.0395*** (0.00584)
1+ AS level	0.240*** (0.0743)	0.0476 (0.122)	0.165** (0.0764)	-0.0163 (0.107)	0.0605 (0.0810)	-0.0271 (0.0844)	0.133** (0.0535)	0.0695 (0.0653)	0.152** (0.0625)	0.0575 (0.0586)	0.0930* (0.0507)	0.159*** (0.0418)	0.0658 (0.0464)	0.124*** (0.0450)	0.0976*** (0.0168)
5+ GCSEs A*-C	0.160*** (0.0101)	0.179*** (0.0104)	0.168*** (0.00840)	0.154*** (0.00868)	0.167*** (0.00855)	0.178*** (0.00951)	0.176*** (0.00834)	0.164*** (0.00847)	0.185*** (0.00987)	0.191*** (0.0101)	0.199*** (0.00906)	0.169*** (0.00888)	0.191*** (0.00873)	0.189*** (0.00943)	0.176*** (0.00243)
4- GCSEs A*-C	0.106*** (0.00950)	0.131*** (0.00995)	0.122*** (0.00823)	0.113*** (0.00843)	0.126*** (0.00846)	0.130*** (0.00940)	0.129*** (0.00841)	0.129*** (0.00841)	0.128*** (0.00980)	0.146*** (0.0102)	0.133*** (0.00921)	0.136*** (0.00878)	0.149*** (0.00879)	0.132*** (0.00950)	0.129*** (0.00240)
1+ GCSEs A*-G	0.0723*** (0.0143)	0.100*** (0.0138)	0.0721*** (0.0114)	0.0913*** (0.0115)	0.0935*** (0.0118)	0.106*** (0.0127)	0.106*** (0.0113)	0.109*** (0.0111)	0.0872*** (0.0150)	0.0985*** (0.0152)	0.0770*** (0.0142)	0.0800*** (0.0134)	0.0885*** (0.0132)	0.0984*** (0.0137)	0.0936*** (0.00341)
RSA level 3	0.0600 (0.0520)	0.132** (0.0546)	0.0146 (0.0537)	0.101* (0.0515)	0.192*** (0.0491)	0.105* (0.0586)	0.0967* (0.0579)	-0.00736 (0.0716)	0.0894 (0.0654)	0.0581 (0.0948)	-0.0892 (0.0851)	0.0692 (0.0749)	-0.162* (0.0916)	0.00429 (0.0900)	0.0597*** (0.0173)
RSA level 2	0.0130 (0.0447)	0.0638 (0.0543)	0.0166 (0.0495)	0.0428 (0.0587)	0.109** (0.0480)	0.0579 (0.0502)	0.00540 (0.0474)	-0.0164 (0.0608)	0.135*** (0.0522)	0.0368 (0.0624)	0.0974* (0.0544)	0.0752 (0.0556)	-0.0102 (0.0610)	0.00469 (0.0623)	0.0407*** (0.0145)
RSA level 1	0.0858*** (0.0109)	0.0798*** (0.0117)	0.0868*** (0.00947)	0.0742*** (0.00992)	0.0728*** (0.0102)	0.0621*** (0.0116)	0.0661*** (0.0106)	0.0697*** (0.0110)	0.0764*** (0.0136)	0.0400*** (0.0151)	0.0408*** (0.0146)	0.0735*** (0.0140)	0.0356** (0.0151)	0.0616*** (0.0164)	0.0693*** (0.00316)
C&G level 3	0.108*** (0.0368)	0.0943** (0.0423)	-0.0262 (0.0355)	0.00428 (0.0332)	0.0667** (0.0315)	0.0298 (0.0347)	0.0158 (0.0314)	0.106*** (0.0295)	0.102*** (0.0349)	0.0450 (0.0386)	0.122*** (0.0369)	0.00954 (0.0371)	0.0707** (0.0359)	0.0525 (0.0394)	0.0539*** (0.00946)
C&G level 2	0.0514* (0.0308)	-1.67e-05 (0.0282)	0.0194 (0.0255)	-0.000937 (0.0269)	-0.00549 (0.0287)	0.0202 (0.0285)	0.0204 (0.0283)	0.0177 (0.0294)	0.0635* (0.0325)	0.0406 (0.0346)	0.00877 (0.0327)	0.0770** (0.0313)	0.0534* (0.0321)	-0.0164 (0.0374)	0.0227*** (0.00804)
C&G level 1	0.0544*** (0.0206)	-0.00557 (0.0280)	0.00591 (0.0252)	-0.0165 (0.0267)	-0.0285 (0.0278)	-0.0726** (0.0302)	-0.0293 (0.0254)	0.0264 (0.0266)	-0.00121 (0.0329)	-0.0592 (0.0364)	-0.0289 (0.0349)	-0.0738** (0.0338)	0.0187 (0.0356)	-0.0358 (0.0366)	-0.0104 (0.00770)
BTEC level 3	0.116*** (0.0266)	0.103*** (0.0285)	0.146*** (0.0217)	0.127*** (0.0212)	0.0804*** (0.0235)	0.113*** (0.0253)	0.0445* (0.0232)	0.110*** (0.0212)	0.0710** (0.0279)	0.102*** (0.0274)	0.105*** (0.0251)	0.109*** (0.0225)	0.0959*** (0.0221)	0.0802*** (0.0250)	0.0982*** (0.00646)
BTEC level 2	0.115*** (0.0403)	0.0364 (0.0535)	0.0821** (0.0379)	0.0790 (0.0489)	0.125** (0.0525)	0.169*** (0.0447)	-0.00921 (0.0562)	0.0434 (0.0538)	0.0684 (0.0526)	0.0323 (0.0583)	0.0806 (0.0518)	0.0614 (0.0483)	-0.0134 (0.0417)	-0.0209 (0.0446)	0.0513*** (0.0131)
BTEC level 1	0.145*** (0.0456)	0.0783 (0.0597)	0.0945** (0.0454)	0.0655 (0.0443)	0.117** (0.0484)	-0.0627 (0.0600)	-0.0286 (0.0557)	0.0857* (0.0512)	0.0237 (0.0663)	0.0472 (0.0720)	0.00871 (0.0752)	0.0433 (0.0599)	0.0540 (0.0519)	-0.0195 (0.0546)	0.0468*** (0.0148)
NVQ level 3	0.155*** (0.0323)	0.218*** (0.0285)	0.175*** (0.0201)	0.168*** (0.0186)	0.226*** (0.0154)	0.198*** (0.0164)	0.155*** (0.0155)	0.175*** (0.0143)	0.205*** (0.0148)	0.170*** (0.0163)	0.0417 (0.0480)	0.163*** (0.0130)	0.173*** (0.0127)	0.143*** (0.0139)	0.170*** (0.00453)
NVQ level 2	0.137*** (0.0205)	0.101*** (0.0214)	0.139*** (0.0153)	0.132*** (0.0148)	0.112*** (0.0147)	0.134*** (0.0142)	0.126*** (0.0128)	0.124*** (0.0127)	0.120*** (0.0145)	0.120*** (0.0143)	0.146*** (0.0121)	0.118*** (0.0115)	0.123*** (0.0116)	0.127*** (0.0116)	0.120*** (0.00366)
NVQ level 1	0.00976 (0.0399)	0.0792** (0.0389)	0.0957*** (0.0257)	0.0152 (0.0288)	0.0262 (0.0269)	0.0827*** (0.0266)	0.0565** (0.0243)	0.0493** (0.0231)	0.0798*** (0.0242)	0.0224 (0.0292)	0.0282 (0.0251)	-0.0351* (0.0203)	-0.0567*** (0.0186)	-0.0320* (0.0177)	0.00881 (0.00659)
Trade App	0.142*** (0.0376)	0.0315 (0.0380)	0.114*** (0.0334)	0.0716** (0.0356)	0.0806** (0.0382)	0.0716* (0.0411)	0.0560 (0.0399)	0.0505 (0.0387)	0.0957* (0.0540)	0.0425 (0.0556)	0.122** (0.0481)	0.142 (0.0955)	0.0624 (0.107)	0.225*** (0.0748)	0.0782*** (0.0119)

Table 87: Average employment returns to academic and vocational qualifications– females

Other	0.104***	0.114***	0.0996***	0.0986***	0.112***	0.0992***	0.109***	0.125***	0.114***	0.107***	0.130***	0.119***	0.125***	0.126***	0.112***
	(0.00810)	(0.00825)	(0.00687)	(0.00700)	(0.00712)	(0.00825)	(0.00719)	(0.00723)	(0.00902)	(0.00935)	(0.00831)	(0.00805)	(0.00806)	(0.00860)	(0.00209)
Voc (L D/K)	0.0590**	0.0582***	0.0531***	0.0678***	0.0989***	0.0578***	0.0712***	0.0732***	0.0875***	0.101***	0.0869***	0.0588***	0.107***	0.0713***	0.0747***
	(0.0232)	(0.0199)	(0.0149)	(0.0147)	(0.0144)	(0.0166)	(0.0148)	(0.0145)	(0.0179)	(0.0177)	(0.0162)	(0.0160)	(0.0155)	(0.0170)	(0.00436)
N	17,284	18,182	23,711	22,775	21,601	16,916	21,666	20,731	14,669	13,199	17,064	17,371	16,705	15,184	257,058

Note: Aggregated average returns to vocational qualifications – pooled Labour Force Survey data 1996-2009

* 10% level of statistical significance; ** 5% level of statistical significance; *** 1% level of statistical significance.

Source: *London Economics*

Annex 2 Detailed results from the BCS

Table 88: Average gross wage returns, BCS 2000

	Males and females		Males		Females	
	No controls	With controls	No controls	With controls	No controls	With controls
1 A-level	0.136*** (0.0403)	0.123*** (0.0456)	0.0959 (0.0634)	0.111 (0.0710)	0.169*** (0.0525)	0.141** (0.0600)
2 or 3 AS levels	-0.158 (0.140)	-0.210 (0.149)	-0.122 (0.211)	-0.150 (0.214)	-0.164 (0.186)	-0.261 (0.208)
1 AS level	-0.164** (0.0776)	-0.276*** (0.0920)	-0.227* (0.119)	-0.243** (0.124)	-0.102 (0.103)	-0.291** (0.143)
High GCSEs	0.260*** (0.0303)	0.143*** (0.0365)	0.282*** (0.0412)	0.156*** (0.0525)	0.226*** (0.0463)	0.102* (0.0535)
Low GCSEs	0.117*** (0.0269)	0.0546* (0.0312)	0.123*** (0.0350)	0.0713* (0.0422)	0.0958** (0.0424)	0.0278 (0.0476)
Other academic	0.0187 (0.0216)	0.00356 (0.0243)	-0.0143 (0.0345)	-0.0188 (0.0409)	0.0367 (0.0279)	0.0143 (0.0304)
RSA level 3	0.0254 (0.0498)	-0.0412 (0.0582)	-0.153 (0.260)	-0.226 (0.286)	0.0363 (0.0515)	-0.0513 (0.0593)
RSA level 2	0.00461 (0.0355)	0.0139 (0.0408)	0.00964 (0.129)	0.0283 (0.153)	-0.00280 (0.0380)	0.0120 (0.0428)
RSA level 1	-0.00334 (0.0248)	-0.00786 (0.0281)	0.0232 (0.0586)	0.0528 (0.0711)	-0.00937 (0.0280)	-0.0230 (0.0308)
C&G level 3	0.0145 (0.0315)	0.00408 (0.0353)	0.0212 (0.0371)	0.00685 (0.0431)	-0.0192 (0.0600)	-0.0369 (0.0649)
C&G level 2	0.00845 (0.0264)	0.0236 (0.0306)	0.0690** (0.0321)	0.108*** (0.0386)	-0.106** (0.0464)	-0.123** (0.0513)
C&G level 1	-0.00861 (0.0198)	0.0298 (0.0222)	0.0142 (0.0259)	0.0418 (0.0298)	-0.0211 (0.0315)	0.0307 (0.0349)
BTEC level 3	0.0196 (0.0357)	-0.00870 (0.0392)	0.0849* (0.0476)	0.101* (0.0543)	-0.0531 (0.0549)	-0.108* (0.0585)
BTEC level 2	-0.0433 (0.0598)	-0.0687 (0.0674)	-0.0762 (0.0873)	-0.147 (0.102)	-0.0140 (0.0824)	0.0222 (0.0910)
BTEC level 1	-0.0284 (0.0291)	-0.0101 (0.0322)	-0.0392 (0.0414)	-0.000848 (0.0488)	-0.0172 (0.0412)	-0.00761 (0.0438)
NVQ level 3	0.0219 (0.0442)	0.0199 (0.0489)	0.0577 (0.0598)	0.0372 (0.0717)	0.00751 (0.0661)	0.0339 (0.0673)
NVQ level 2	-0.0697** (0.0330)	-0.0611* (0.0368)	-0.0471 (0.0488)	-0.0535 (0.0547)	-0.0831* (0.0456)	-0.0666 (0.0506)
NVQ level 1	-0.0641* (0.0340)	-0.0394 (0.0383)	-0.103** (0.0510)	-0.116* (0.0603)	-0.0280 (0.0459)	0.0116 (0.0509)
Pitman level 3	0.0396 (0.0708)	0.0509 (0.0855)	-0.298 (0.261)	-0.401 (0.309)	0.0804 (0.0748)	0.111 (0.0893)
Pitman level 2	0.107* (0.0557)	0.0994 (0.0625)	0.274 (0.232)	0.605* (0.310)	0.110* (0.0582)	0.0785 (0.0639)
Pitman level 1	0.0571* (0.0317)	0.0652* (0.0367)	0.0455 (0.0991)	0.0826 (0.111)	0.0473 (0.0341)	0.0519 (0.0391)
Trade App	0.0979*** (0.0357)	0.0902** (0.0396)	0.0654* (0.0384)	0.0544 (0.0436)	0.106 (0.103)	0.120 (0.120)
Other voc'l	0.0161 (0.0178)	0.00370 (0.0199)	0.0108 (0.0247)	0.0100 (0.0285)	0.0198 (0.0259)	0.00299 (0.0287)
Married	0.0266 (0.0170)	0.0308 (0.0192)	0.0860*** (0.0252)	0.0962*** (0.0289)	-0.0189 (0.0231)	-0.0283 (0.0259)
Long-term illness	-0.0867*** (0.0189)	-0.0922*** (0.0212)	-0.0845*** (0.0264)	-0.0746** (0.0307)	-0.0829*** (0.0271)	-0.106*** (0.0297)
Part-time	-0.179*** (0.0250)	-0.163*** (0.0285)	-0.176 (0.109)	-0.0878 (0.130)	-0.158*** (0.0299)	-0.109*** (0.0340)
Private sector	-0.0401**	-0.0276	0.00738	0.0185	-0.0764***	-0.0572**

Table 88: Average gross wage returns, BCS 2000

	(0.0187)	(0.0212)	(0.0293)	(0.0338)	(0.0245)	(0.0275)
Employer size: 10-24	0.0458*	0.0460	0.0594	0.0546	0.0277	0.0286
	(0.0258)	(0.0292)	(0.0375)	(0.0438)	(0.0356)	(0.0397)
Employer size: 25-99	0.0637***	0.0865***	0.0738**	0.0732*	0.0468	0.0849**
	(0.0244)	(0.0276)	(0.0350)	(0.0407)	(0.0341)	(0.0378)
Employ. size: 100-499	0.126***	0.129***	0.136***	0.119***	0.114***	0.129***
	(0.0243)	(0.0273)	(0.0356)	(0.0413)	(0.0337)	(0.0373)
Employer size: >500	0.236***	0.259***	0.234***	0.220***	0.226***	0.277***
	(0.0268)	(0.0303)	(0.0390)	(0.0455)	(0.0370)	(0.0412)
Non-white	0.0185	0.0977	-0.0430	0.0115	0.0433	0.124
	(0.0645)	(0.0750)	(0.0949)	(0.126)	(0.0887)	(0.0946)
Experience	0.00169***	0.00162***	0.00218***	0.00179***	0.00113***	0.00117***
	(0.000281)	(0.000313)	(0.000478)	(0.000543)	(0.000370)	(0.000413)
No. children 0-5	0.0235*	0.0179	0.00574	0.00919	0.0233	-0.0135
	(0.0127)	(0.0140)	(0.0167)	(0.0191)	(0.0204)	(0.0223)
No. children 5-16	-0.0172	-0.0120	0.0102	0.0214	-0.0561***	-0.0579**
	(0.0142)	(0.0158)	(0.0208)	(0.0236)	(0.0206)	(0.0234)
Female	-0.124***	-0.130***				
	(0.0198)	(0.0224)				
FSM (age 10)		0.00944		0.00197		0.0231
		(0.0277)		(0.0421)		(0.0375)
Financial hardship		-0.0221		-0.0112		-0.0200
		(0.0306)		(0.0463)		(0.0418)
Social class (i)		0.147**		0.147		0.140
		(0.0701)		(0.102)		(0.0990)
Social class (ii)		0.0531		0.00560		0.104**
		(0.0360)		(0.0531)		(0.0500)
Social class (iii manual)		-0.0107		-0.0115		-0.00545
		(0.0275)		(0.0404)		(0.0381)
Soc. class (iii non-man)		0.154***		0.154***		0.185***
		(0.0392)		(0.0560)		(0.0559)
Social class (iv)		0.00700		-0.0256		0.0515
		(0.0338)		(0.0502)		(0.0459)
Social class (v)		-0.0116		-0.0316		0.0154
		(0.0501)		(0.0719)		(0.0702)
Math score (age 10)		0.00459***		0.00279*		0.00587***
		(0.00117)		(0.00167)		(0.00168)
Reading score (age 10)		0.000917		0.00244		0.000130
		(0.00126)		(0.00183)		(0.00181)
Ability (age 10)		0.000791		0.000412		0.00108
		(0.000741)		(0.000998)		(0.00114)
Father has degree		0.00797		0.0778		-0.0367
		(0.0432)		(0.0655)		(0.0587)
Father has A-levels		0.0570		0.0403		0.0881
		(0.0404)		(0.0610)		(0.0551)
Mother has degree		-0.210		-0.188		-0.0724
		(0.150)		(0.190)		(0.259)
Mother has A-levels		-0.0559		0.0314		-0.0787
		(0.0656)		(0.103)		(0.0856)
Father v. interested		-0.0272		-0.0357		0.00141
		(0.0256)		(0.0391)		(0.0345)
Father mod. interested		-0.0142		-0.0385		0.0333
		(0.0240)		(0.0350)		(0.0335)
Father v. little interest		0.0218		-0.0286		0.0931
		(0.0550)		(0.0751)		(0.0835)
Father uninterested		0.0203		-0.0151		0.00289
		(0.0758)		(0.109)		(0.108)
Mother v. interested		0.0613**		0.0440		0.0652*
		(0.0284)		(0.0419)		(0.0393)
Mother mod. Interest		0.0320		0.0428		0.0183
		(0.0274)		(0.0402)		(0.0383)
Mother v. little interest		-0.0143		0.0302		-0.0645
		(0.0531)		(0.0706)		(0.0826)
Mother uninterested		-0.0222		0.0270		-0.0340

Table 88: Average gross wage returns, BCS 2000

		(0.0933)		(0.123)		(0.152)
Constant	1.536***	1.262***	1.375***	1.216***	1.587***	1.219***
	(0.0549)	(0.0816)	(0.0854)	(0.124)	(0.0754)	(0.113)
N	2234	1731	1063	831	1171	900
Adjusted R ²	0.236	0.284	0.190	0.235	0.190	0.235

Source: London Economics' analysis of the BCS70

Table 89: Average gross wage returns, BCS 2004

	Males and females		Males		Females	
	No controls	With controls	No controls	With controls	No controls	With controls
1 A-level	0.108** (0.0440)	0.0491 (0.0502)	0.0617 (0.0672)	0.0451 (0.0760)	0.145** (0.0593)	0.0550 (0.0702)
2 or 3 AS levels	0.180 (0.136)	0.238 (0.157)	0.295* (0.178)	0.498** (0.234)	-0.0128 (0.217)	0.0500 (0.216)
1 AS level	-0.0806 (0.0831)	-0.0604 (0.0962)	-0.0794 (0.132)	-0.0358 (0.136)	-0.0564 (0.108)	-0.0434 (0.142)
High GCSEs	0.243*** (0.0322)	0.136*** (0.0395)	0.246*** (0.0456)	0.124** (0.0583)	0.246*** (0.0477)	0.133** (0.0582)
Low GCSEs	0.117*** (0.0284)	0.0701** (0.0336)	0.111*** (0.0385)	0.0708 (0.0468)	0.121*** (0.0434)	0.0668 (0.0511)
Other academic	-0.00584 (0.0242)	0.00398 (0.0279)	-0.0274 (0.0401)	-0.0844* (0.0490)	0.00465 (0.0305)	0.0508 (0.0346)
RSA level 3	-0.0490 (0.0574)	-0.0918 (0.0655)	-0.0452 (0.250)	-0.0600 (0.305)	-0.0505 (0.0583)	-0.107 (0.0658)
RSA level 2	0.0113 (0.0391)	0.0344 (0.0457)	-0.0283 (0.129)	-0.0650 (0.153)	0.0129 (0.0411)	0.0434 (0.0477)
RSA level 1	0.00482 (0.0268)	0.00356 (0.0308)	0.0118 (0.0610)	0.0480 (0.0730)	-0.00234 (0.0297)	-0.0216 (0.0339)
C&G level 3	0.00204 (0.0345)	0.0122 (0.0394)	-0.000811 (0.0424)	0.00324 (0.0493)	0.000272 (0.0658)	0.0273 (0.0759)
C&G level 2	-0.0294 (0.0284)	-0.0501 (0.0330)	0.00207 (0.0367)	-0.0152 (0.0431)	-0.0927** (0.0468)	-0.111** (0.0550)
C&G level 1	-0.00566 (0.0213)	0.0155 (0.0243)	0.0183 (0.0290)	0.0322 (0.0339)	-0.0384 (0.0326)	-0.0137 (0.0374)
BTEC level 3	0.101*** (0.0385)	0.0926** (0.0436)	0.112** (0.0554)	0.140** (0.0633)	0.101* (0.0551)	0.0710 (0.0630)
BTEC level 2	0.0483 (0.0594)	0.00423 (0.0681)	0.0334 (0.0940)	-0.0230 (0.109)	0.0464 (0.0776)	-0.00296 (0.0884)
BTEC level 1	-0.0484 (0.0323)	-0.0429 (0.0361)	-0.0615 (0.0476)	-0.00908 (0.0548)	-0.0541 (0.0449)	-0.0715 (0.0494)
NVQ level 3	0.0239 (0.0376)	0.0481 (0.0428)	0.0195 (0.0530)	0.0423 (0.0642)	0.0245 (0.0548)	0.0440 (0.0598)
NVQ level 2	-0.0620** (0.0309)	-0.0484 (0.0349)	-0.00201 (0.0473)	0.0240 (0.0530)	-0.117*** (0.0417)	-0.113** (0.0481)
NVQ level 1	-0.0527 (0.0326)	-0.0500 (0.0384)	-0.0874* (0.0479)	-0.0553 (0.0598)	-0.0161 (0.0453)	-0.0349 (0.0518)
Pitman level 3	0.104 (0.0760)	0.0421 (0.0918)	0.0781 (0.255)	0.0996 (0.337)	0.105 (0.0794)	0.0662 (0.0945)
Pitman level 2	-0.0417 (0.0575)	-0.0464 (0.0642)	0.0404 (0.231)	0.0847 (0.340)	-0.0369 (0.0587)	-0.0629 (0.0645)
Pitman level 1	0.0480 (0.0343)	0.0613 (0.0396)	0.0972 (0.106)	0.0661 (0.121)	0.0312 (0.0363)	0.0483 (0.0418)
Trade App	0.119*** (0.0404)	0.0893** (0.0454)	0.0950** (0.0441)	0.0771 (0.0503)	0.233* (0.141)	0.149 (0.186)
Other voc'l	0.0105 (0.0184)	-0.0198 (0.0211)	-0.0186 (0.0260)	-0.0570* (0.0304)	0.0318 (0.0269)	0.00154 (0.0304)
Married	0.0715*** (0.0191)	0.0631*** (0.0217)	0.0987*** (0.0291)	0.110*** (0.0338)	0.0419 (0.0259)	0.0224 (0.0295)
Long-term illness	-0.0143 (0.0197)	0.00112 (0.0224)	-0.0140 (0.0290)	0.0113 (0.0340)	-0.0223 (0.0272)	-0.0126 (0.0307)
Part-time	-0.188*** (0.0255)	-0.186*** (0.0292)	-0.284*** (0.110)	-0.272** (0.136)	-0.161*** (0.0283)	-0.156*** (0.0321)
Private sector	0.0137 (0.0202)	0.0251 (0.0228)	0.00855 (0.0319)	0.0431 (0.0369)	0.0129 (0.0265)	0.00657 (0.0297)
Employer size: 10-24	0.0201 (0.0290)	0.0269 (0.0337)	0.00788 (0.0433)	0.00216 (0.0528)	0.0301 (0.0397)	0.0385 (0.0450)
Employer size: 25-99	0.0540** (0.0268)	0.0542* (0.0311)	0.0861** (0.0389)	0.0770 (0.0474)	0.0140 (0.0377)	0.0167 (0.0427)
Employ. size: 100-499	0.109***	0.124***	0.153***	0.172***	0.0702*	0.0590

Table 89: Average gross wage returns, BCS 2004

	(0.0271)	(0.0315)	(0.0403)	(0.0476)	(0.0373)	(0.0434)
Employer size: >500	0.202***	0.226***	0.208***	0.249***	0.196***	0.188***
	(0.0291)	(0.0339)	(0.0430)	(0.0524)	(0.0403)	(0.0461)
Non-white	0.0277	0.139	-0.0363	0.0589	0.0862	0.155
	(0.0775)	(0.0984)	(0.114)	(0.155)	(0.108)	(0.132)
Experience	0.00196***	0.00174***	0.00235***	0.00213***	0.00155***	0.00134***
	(0.000252)	(0.000292)	(0.000454)	(0.000532)	(0.000316)	(0.000367)
No. children 0-5	0.0300**	0.0323**	0.0256	0.0367*	0.0249	0.0112
	(0.0136)	(0.0155)	(0.0186)	(0.0215)	(0.0210)	(0.0240)
No. children 5-16	-0.0139	0.00703	-0.000606	0.0194	-0.0408**	-0.0324*
	(0.0111)	(0.0127)	(0.0167)	(0.0194)	(0.0161)	(0.0186)
Female	-0.154***	-0.162***				
	(0.0228)	(0.0262)				
FSM (age 10)		-0.0657**		-0.0653		-0.0394
		(0.0307)		(0.0485)		(0.0412)
Financial hardship		-0.0842**		-0.0532		-0.0992**
		(0.0332)		(0.0515)		(0.0449)
Social class (i)		0.0391		-0.0578		0.172
		(0.0776)		(0.117)		(0.108)
Social class (ii)		-0.0659*		-0.0905		-0.0387
		(0.0396)		(0.0600)		(0.0542)
Social class (iii manual)		-0.0138		-0.0343		0.00587
		(0.0316)		(0.0471)		(0.0438)
Soc. class (iii non-man)		0.0784*		0.0767		0.0903
		(0.0437)		(0.0635)		(0.0625)
Social class (iv)		-0.000600		-0.0407		0.0442
		(0.0381)		(0.0572)		(0.0526)
Social class (v)		0.0195		0.0892		-0.0833
		(0.0538)		(0.0758)		(0.0791)
Math score (age 10)		0.00321**		0.00318*		0.00354*
		(0.00130)		(0.00190)		(0.00186)
Reading score (age 10)		0.00196		0.00187		0.00190
		(0.00139)		(0.00206)		(0.00195)
Ability (age 10)		0.000706		0.000307		0.000761
		(0.000838)		(0.00116)		(0.00129)
Father has degree		0.133***		0.258***		-0.0164
		(0.0468)		(0.0673)		(0.0689)
Father has A-levels		0.100**		0.132*		0.0716
		(0.0440)		(0.0675)		(0.0589)
Mother has degree		-0.0766		-0.158		0.146
		(0.157)		(0.207)		(0.264)
Mother has A-levels		-0.0388		-0.0143		-0.0194
		(0.0688)		(0.108)		(0.0912)
Father v. interested		0.0443		0.0474		0.0669*
		(0.0283)		(0.0439)		(0.0384)
Father mod. interested		-0.0124		-0.0138		-0.00519
		(0.0267)		(0.0394)		(0.0373)
Father v. little interest		-0.0281		0.0417		-0.0772
		(0.0613)		(0.0911)		(0.0884)
Father uninterested		-0.153*		-0.0446		-0.264**
		(0.0809)		(0.130)		(0.106)
Mother v. interested		0.0209		0.0362		0.000479
		(0.0320)		(0.0477)		(0.0446)
Mother mod. Interest		0.0279		0.0292		0.0307
		(0.0311)		(0.0462)		(0.0437)
Mother v. little interest		0.0167		-0.0509		0.0990
		(0.0581)		(0.0804)		(0.0893)
Mother uninterested		0.165*		0.0325		0.299**
		(0.0984)		(0.145)		(0.143)
Constant	1.620***	1.430***	1.516***	1.319***	1.592***	1.423***
	(0.0621)	(0.0934)	(0.102)	(0.149)	(0.0827)	(0.126)
N	1986	1534	982	760	1004	774
Adjusted R ²	0.282	0.317	0.173	0.254	0.258	0.281

Table 90: Average net wage returns, BCS 1996

	Males and females		Males		Females	
	No controls	With controls	No controls	With controls	No controls	With controls
1 A-level	0.0927** (0.0395)	0.0986** (0.0435)	0.134** (0.0653)	0.138* (0.0738)	0.0605 (0.0495)	0.0710 (0.0538)
2 or 3 AS levels	-0.0776 (0.134)	-0.210 (0.137)	-0.0813 (0.224)	-0.124 (0.218)	-0.0890 (0.167)	-0.295* (0.176)
1 AS level	-0.0522 (0.0782)	-0.0334 (0.0857)	-0.106 (0.135)	-0.0846 (0.140)	-0.0128 (0.0958)	0.0159 (0.110)
High GCSEs	0.179*** (0.0327)	0.128*** (0.0388)	0.155*** (0.0458)	0.0964* (0.0546)	0.206*** (0.0498)	0.177*** (0.0603)
Low GCSEs	0.0828*** (0.0301)	0.0602* (0.0346)	0.0608 (0.0403)	0.0468 (0.0460)	0.112** (0.0474)	0.104* (0.0563)
Other academic	-0.00438 (0.0219)	-0.00409 (0.0243)	-0.0749** (0.0380)	-0.0818* (0.0435)	0.0336 (0.0266)	0.0312 (0.0290)
RSA level 3	0.0340 (0.0506)	0.0179 (0.0567)	0.0727 (0.244)	-0.00562 (0.276)	0.0355 (0.0502)	0.00898 (0.0565)
RSA level 2	0.0359 (0.0371)	0.0158 (0.0413)	-0.175 (0.151)	-0.207 (0.163)	0.0365 (0.0376)	0.0199 (0.0418)
RSA level 1	-0.0342 (0.0262)	-0.0145 (0.0289)	-0.00773 (0.0677)	0.0622 (0.0799)	-0.0501* (0.0279)	-0.0322 (0.0304)
C&G level 3	0.0943*** (0.0331)	0.122*** (0.0364)	0.114*** (0.0415)	0.135*** (0.0459)	0.0686 (0.0592)	0.0745 (0.0649)
C&G level 2	-0.0320 (0.0286)	-0.0332 (0.0324)	0.00540 (0.0369)	0.0110 (0.0419)	-0.103** (0.0470)	-0.0976* (0.0542)
C&G level 1	-0.0532** (0.0214)	-0.0540** (0.0236)	-0.0107 (0.0305)	-0.0116 (0.0340)	-0.0902*** (0.0309)	-0.0774** (0.0340)
BTEC level 3	0.0383 (0.0378)	0.0410 (0.0421)	0.0389 (0.0545)	0.0368 (0.0612)	0.0495 (0.0533)	0.0722 (0.0592)
BTEC level 2	-0.112* (0.0604)	-0.137** (0.0667)	-0.182* (0.100)	-0.244** (0.112)	-0.0713 (0.0753)	-0.0531 (0.0829)
BTEC level 1	-0.0618* (0.0323)	-0.0623* (0.0349)	-0.0528 (0.0489)	-0.0500 (0.0544)	-0.0717* (0.0432)	-0.0578 (0.0461)
NVQ level 3	-0.0138 (0.0659)	0.00311 (0.0718)	0.00870 (0.104)	-0.0327 (0.116)	-0.0151 (0.0872)	0.0694 (0.0928)
NVQ level 2	-0.0260 (0.0477)	0.00182 (0.0527)	-0.0659 (0.0823)	-0.0838 (0.0957)	0.00978 (0.0585)	0.0608 (0.0634)
NVQ level 1	-0.118*** (0.0440)	-0.101** (0.0490)	-0.0838 (0.0674)	-0.101 (0.0801)	-0.151** (0.0591)	-0.103 (0.0625)
Pitman level 3	0.0633 (0.0761)	0.0243 (0.0916)	-0.132 (0.259)	-0.169 (0.326)	0.0823 (0.0776)	0.0271 (0.0929)
Pitman level 2	-9.67e-05 (0.0558)	0.0355 (0.0618)	0.0923 (0.217)	0.225 (0.260)	-0.00938 (0.0559)	0.00237 (0.0621)
Pitman level 1	0.0438 (0.0340)	0.0352 (0.0378)	-0.0291 (0.122)	-0.0954 (0.126)	0.0458 (0.0344)	0.0598 (0.0386)
Trade App	0.0942** (0.0392)	0.0971** (0.0433)	0.0778* (0.0440)	0.0978** (0.0485)	0.118 (0.118)	0.0640 (0.149)
Other voc'l	-0.00287 (0.0207)	-0.0219 (0.0226)	-0.0235 (0.0318)	-0.0284 (0.0354)	0.0173 (0.0276)	-0.00554 (0.0301)
Married	0.0447** (0.0183)	0.0431** (0.0203)	0.0614** (0.0305)	0.0643* (0.0340)	0.0316 (0.0229)	0.0291 (0.0253)
Long-term illness	-0.0286 (0.0231)	-0.0211 (0.0253)	-0.0324 (0.0367)	-0.0147 (0.0406)	-0.0272 (0.0297)	-0.0229 (0.0325)
Part-time	0.00579 (0.0287)	0.00579 (0.0319)	0.0631 (0.0954)	0.173 (0.110)	0.0196 (0.0313)	0.00951 (0.0350)
Employer size: 10-24	0.0160 (0.0249)	0.0478* (0.0278)	-0.0357 (0.0372)	-0.00998 (0.0421)	0.0637* (0.0337)	0.0994*** (0.0378)
Employer size: 25-99	0.0703*** (0.0237)	0.101*** (0.0262)	0.0532 (0.0362)	0.0539 (0.0403)	0.0863*** (0.0315)	0.140*** (0.0349)
Employ. size: 100-499	0.105*** (0.0242)	0.151*** (0.0269)	0.125*** (0.0367)	0.181*** (0.0412)	0.0969*** (0.0323)	0.135*** (0.0359)
Employer size: >500	0.173***	0.195***	0.170***	0.163***	0.179***	0.223***

Table 90: Average net wage returns, BCS 1996

	(0.0270)	(0.0301)	(0.0435)	(0.0485)	(0.0346)	(0.0388)
Non-white	0.0431	0.0689	-0.108	-0.0668	0.110	0.113
	(0.0749)	(0.0873)	(0.124)	(0.153)	(0.0935)	(0.106)
Experience	0.00124***	0.000604	0.00142**	0.00104	0.000734	7.64e-05
	(0.000366)	(0.000411)	(0.000597)	(0.000665)	(0.000481)	(0.000541)
No. children 0-5	0.0177	0.0274	0.0242	0.0464	0.00273	0.00342
	(0.0160)	(0.0182)	(0.0254)	(0.0291)	(0.0211)	(0.0244)
No. children 5-16	-0.0214	-0.0341	0.0225	-0.0200	-0.0898**	-0.0745*
	(0.0264)	(0.0295)	(0.0383)	(0.0425)	(0.0383)	(0.0433)
Female	-0.144***	-0.149***				
	(0.0190)	(0.0215)				
FSM (age 10)		0.0186		0.0374		0.00564
		(0.0297)		(0.0478)		(0.0385)
Financial hardship		-0.00809		0.00623		-0.0329
		(0.0325)		(0.0509)		(0.0428)
Social class (i)		-0.0156		-0.0509		0.0461
		(0.0733)		(0.114)		(0.0960)
Social class (ii)		-0.00227		0.0329		-0.0272
		(0.0362)		(0.0554)		(0.0479)
Social class (iii manual)		-0.0286		0.0234		-0.0799**
		(0.0287)		(0.0451)		(0.0376)
Social class (iii non-man)		-0.00631		0.0589		-0.0601
		(0.0399)		(0.0611)		(0.0531)
Social class (iv)		-0.0434		-0.0352		-0.0522
		(0.0355)		(0.0560)		(0.0460)
Social class (v)		-0.00959		-0.0110		-0.0178
		(0.0538)		(0.0812)		(0.0728)
Math score (age 10)		-6.43e-05		-0.00113		0.00154
		(0.00122)		(0.00184)		(0.00166)
Reading score (age 10)		0.00270**		0.00298		0.00280
		(0.00130)		(0.00196)		(0.00179)
Ability (age 10)		0.000803		0.000615		0.000273
		(0.000800)		(0.00118)		(0.00112)
Father has degree		0.0553		0.146**		-0.0423
		(0.0413)		(0.0634)		(0.0557)
Father has A-levels		0.107***		0.0851		0.117**
		(0.0392)		(0.0647)		(0.0496)
Mother has degree		-0.0915		-0.186		0.0461
		(0.114)		(0.163)		(0.162)
Mother has A-levels		-0.0114		-0.00256		-0.0254
		(0.0634)		(0.0998)		(0.0824)
Father v. interested		0.0137		-0.0216		0.0484
		(0.0258)		(0.0410)		(0.0335)
Father mod. Interested		0.0167		-0.00137		0.0324
		(0.0251)		(0.0386)		(0.0335)
Father v. little interest		-0.0783		-0.0404		-0.150*
		(0.0609)		(0.0898)		(0.0850)
Father uninterested		0.142		0.213		0.0696
		(0.0886)		(0.145)		(0.114)
Mother v. interested		0.0396		0.0525		0.0154
		(0.0296)		(0.0459)		(0.0392)
Mother mod. Interested		0.0362		0.0165		0.0355
		(0.0293)		(0.0461)		(0.0384)
Mother v. little interest		0.0711		-0.0368		0.210**
		(0.0576)		(0.0806)		(0.0855)
Mother uninterested		-0.132		-0.211		-0.0185
		(0.111)		(0.157)		(0.180)
Constant	1.253***	1.145***	1.249***	1.142***	1.135***	1.002***
	(0.0494)	(0.0797)	(0.0738)	(0.121)	(0.0705)	(0.109)
N	2676	2043	1233	938	1443	1105
Adjusted R ²	0.091	0.123	0.085	0.136	0.083	0.131

Source: London Economics

Table 91: Average net wage returns, BCS 2000

	Males and females		Males		Females	
	No controls	With controls	No controls	With controls	No controls	With controls
1 A-level	0.123*** (0.0363)	0.114*** (0.0411)	0.118** (0.0580)	0.127* (0.0652)	0.129*** (0.0465)	0.115** (0.0531)
2 or 3 AS levels	-0.160 (0.126)	-0.209 (0.135)	-0.104 (0.193)	-0.115 (0.197)	-0.185 (0.165)	-0.303 (0.184)
1 AS level	-0.133* (0.0698)	-0.212** (0.0830)	-0.197* (0.109)	-0.200* (0.114)	-0.0839 (0.0912)	-0.217* (0.127)
High GCSEs	0.223*** (0.0273)	0.117*** (0.0329)	0.234*** (0.0377)	0.118** (0.0482)	0.199*** (0.0410)	0.0921* (0.0474)
Low GCSEs	0.104*** (0.0242)	0.0514* (0.0281)	0.104*** (0.0320)	0.0552 (0.0388)	0.0887** (0.0375)	0.0375 (0.0422)
Other academic	0.0106 (0.0195)	-0.000984 (0.0220)	-0.0154 (0.0317)	-0.0262 (0.0378)	0.0239 (0.0247)	0.0115 (0.0269)
RSA level 3	0.0188 (0.0448)	-0.0419 (0.0525)	-0.249 (0.237)	-0.286 (0.263)	0.0331 (0.0456)	-0.0437 (0.0525)
RSA level 2	-0.00156 (0.0320)	0.00432 (0.0369)	0.0189 (0.118)	0.0345 (0.141)	-0.00880 (0.0337)	0.000750 (0.0379)
RSA level 1	0.00929 (0.0224)	0.00849 (0.0253)	0.0216 (0.0535)	0.0379 (0.0653)	0.00807 (0.0248)	0.000283 (0.0273)
C&G level 3	0.0189 (0.0283)	0.00310 (0.0319)	0.0354 (0.0339)	0.0150 (0.0396)	-0.0385 (0.0531)	-0.0559 (0.0574)
C&G level 2	-0.000302 (0.0238)	0.0138 (0.0276)	0.0469 (0.0293)	0.0814** (0.0355)	-0.0846** (0.0411)	-0.0999** (0.0455)
C&G level 1	-0.00540 (0.0179)	0.0310 (0.0201)	0.0174 (0.0237)	0.0425 (0.0274)	-0.0168 (0.0280)	0.0347 (0.0310)
BTEC level 3	0.0190 (0.0323)	-0.0147 (0.0355)	0.0837* (0.0435)	0.0900* (0.0499)	-0.0459 (0.0490)	-0.111** (0.0525)
BTEC level 2	-0.0386 (0.0538)	-0.0467 (0.0608)	-0.0622 (0.0798)	-0.0885 (0.0936)	-0.0116 (0.0730)	0.0141 (0.0806)
BTEC level 1	-0.0340 (0.0262)	-0.0151 (0.0290)	-0.0564 (0.0378)	-0.0221 (0.0449)	-0.0102 (0.0365)	0.000838 (0.0387)
NVQ level 3	0.0317 (0.0398)	0.0263 (0.0441)	0.0695 (0.0547)	0.0515 (0.0659)	0.00314 (0.0586)	0.0211 (0.0596)
NVQ level 2	-0.0640** (0.0298)	-0.0624* (0.0333)	-0.0362 (0.0446)	-0.0412 (0.0502)	-0.0802** (0.0407)	-0.0812* (0.0452)
NVQ level 1	-0.0500 (0.0306)	-0.0267 (0.0346)	-0.0839* (0.0467)	-0.0892 (0.0554)	-0.0227 (0.0407)	0.0168 (0.0451)
Pitman level 3	0.0609 (0.0638)	0.0585 (0.0773)	-0.308 (0.239)	-0.452 (0.284)	0.102 (0.0663)	0.121 (0.0792)
Pitman level 2	0.0548 (0.0505)	0.0561 (0.0570)	0.238 (0.212)	0.509* (0.285)	0.0547 (0.0519)	0.0412 (0.0572)
Pitman level 1	0.0441 (0.0286)	0.0533 (0.0332)	0.0188 (0.0905)	0.0771 (0.102)	0.0383 (0.0302)	0.0413 (0.0347)
Trade App	0.0857*** (0.0322)	0.0904** (0.0357)	0.0541 (0.0351)	0.0571 (0.0401)	0.0981 (0.0913)	0.127 (0.107)
Other voc'l	0.0140 (0.0160)	0.00465 (0.0180)	0.0180 (0.0227)	0.0190 (0.0263)	0.00592 (0.0229)	-0.00849 (0.0254)
Married	0.0210 (0.0153)	0.0289* (0.0173)	0.0819*** (0.0231)	0.0940*** (0.0266)	-0.0258 (0.0205)	-0.0288 (0.0229)
Long-term illness	-0.0697*** (0.0170)	-0.0739*** (0.0191)	-0.0673*** (0.0241)	-0.0612** (0.0283)	-0.0662*** (0.0240)	-0.0836*** (0.0263)
Part-time	-0.0448** (0.0225)	-0.0252 (0.0257)	0.0398 (0.0997)	0.146 (0.120)	-0.0393 (0.0265)	0.00393 (0.0301)
Private sector	-0.0183 (0.0169)	-0.00817 (0.0191)	0.0140 (0.0268)	0.0162 (0.0311)	-0.0462** (0.0218)	-0.0265 (0.0244)
Employer size: 10-24	0.0309 (0.0232)	0.0343 (0.0264)	0.0517 (0.0343)	0.0583 (0.0402)	0.00479 (0.0316)	0.000549 (0.0352)
Employer size: 25-99	0.0408* (0.0219)	0.0624** (0.0249)	0.0555* (0.0320)	0.0574 (0.0374)	0.0159 (0.0302)	0.0461 (0.0335)
Employ. size: 100-499	0.0870***	0.0926***	0.100***	0.0894**	0.0692**	0.0830**

Table 91: Average net wage returns, BCS 2000

	(0.0219)	(0.0246)	(0.0325)	(0.0380)	(0.0298)	(0.0331)
Employer size: >500	0.175***	0.196***	0.177***	0.161***	0.160***	0.204***
	(0.0241)	(0.0274)	(0.0357)	(0.0418)	(0.0328)	(0.0365)
Non-white	0.0418	0.122*	0.0222	0.109	0.0315	0.114
	(0.0580)	(0.0676)	(0.0868)	(0.116)	(0.0785)	(0.0838)
Experience	0.00134***	0.00129***	0.00199***	0.00176***	0.000766**	0.000780**
	(0.000253)	(0.000283)	(0.000437)	(0.000499)	(0.000328)	(0.000366)
No. children 0-5	0.0201*	0.0142	-0.00183	-0.00238	0.0295	0.000287
	(0.0114)	(0.0127)	(0.0153)	(0.0175)	(0.0181)	(0.0198)
No. children 5-16	-0.0106	-0.00523	0.00933	0.0159	-0.0433**	-0.0424**
	(0.0128)	(0.0143)	(0.0190)	(0.0217)	(0.0182)	(0.0207)
Female	-0.0941***	-0.105***				
	(0.0178)	(0.0202)				
FSM (age 10)		0.00627		0.0127		0.00484
		(0.0250)		(0.0388)		(0.0332)
Financial hardship		-0.0107		-0.0211		0.00987
		(0.0277)		(0.0425)		(0.0372)
Social class (i)		0.130**		0.120		0.139
		(0.0633)		(0.0934)		(0.0877)
Social class (ii)		0.0448		0.00833		0.0811*
		(0.0324)		(0.0488)		(0.0442)
Social class (iii manual)		-0.0155		-0.0235		-0.00641
		(0.0248)		(0.0371)		(0.0337)
Social class (iii non-man)		0.130***		0.136***		0.146***
		(0.0354)		(0.0515)		(0.0495)
Social class (iv)		-0.00837		-0.0341		0.0276
		(0.0305)		(0.0461)		(0.0407)
Social class (v)		-0.00525		-0.0349		0.0255
		(0.0457)		(0.0677)		(0.0622)
Math score (age 10)		0.00388***		0.00209		0.00520***
		(0.00105)		(0.00154)		(0.00149)
Reading score (age 10)		0.000924		0.00211		0.000265
		(0.00114)		(0.00169)		(0.00160)
Ability (age 10)		0.000692		0.000410		0.000948
		(0.000670)		(0.000918)		(0.00101)
Father has degree		0.0143		0.0839		-0.0297
		(0.0390)		(0.0601)		(0.0520)
Father has A-levels		0.0590		0.0323		0.102**
		(0.0365)		(0.0560)		(0.0488)
Mother has degree		-0.238*		-0.239		-0.0722
		(0.135)		(0.174)		(0.229)
Mother has A-levels		-0.0472		-0.00677		-0.0480
		(0.0592)		(0.0950)		(0.0758)
Father v. interested		-0.0283		-0.0457		0.00389
		(0.0231)		(0.0359)		(0.0306)
Father mod. Interested		-0.0182		-0.0500		0.0308
		(0.0217)		(0.0323)		(0.0297)
Father v. little interest		0.00273		-0.0739		0.0957
		(0.0496)		(0.0691)		(0.0740)
Father uninterested		0.0299		0.0133		-0.00747
		(0.0684)		(0.100)		(0.0955)
Mother v. interested		0.0510**		0.0516		0.0392
		(0.0256)		(0.0385)		(0.0349)
Mother mod. Interested		0.0254		0.0486		-0.000171
		(0.0248)		(0.0371)		(0.0340)
Mother v. little interest		-0.0146		0.0245		-0.0509
		(0.0479)		(0.0649)		(0.0732)
Mother uninterested		-0.0852		-0.0684		-0.0458

Table 91: Average net wage returns, BCS 2000

		(0.0842)		(0.113)		(0.135)
Mother v. uninterested	-0.0183	-0.00817	0.0140	0.0162	-0.0462**	-0.0265
	(0.0169)	(0.0191)	(0.0268)	(0.0311)	(0.0218)	(0.0244)
Constant	1.338***	1.104***	1.166***	1.040***	1.413***	1.086***
	(0.0494)	(0.0736)	(0.0781)	(0.114)	(0.0668)	(0.100)
N	2230	1727	1061	829	1169	898
Adjusted R ²	0.156	0.207	0.161	0.211	0.159	0.236

Source: London Economics

Table 92: Average net wage returns, BCS 2004

	Males and females		Males		Females	
	No controls	With controls	No controls	With controls	No controls	With controls
1 A-level	0.0933** (0.0406)	0.0382 (0.0462)	0.0700 (0.0623)	0.0500 (0.0700)	0.109** (0.0547)	0.0212 (0.0650)
2 or 3 AS levels	0.150 (0.125)	0.233 (0.145)	0.233 (0.165)	0.452** (0.215)	-0.00204 (0.200)	0.0718 (0.200)
1 AS level	-0.0569 (0.0767)	-0.0386 (0.0886)	-0.0497 (0.122)	-0.0178 (0.126)	-0.0435 (0.0993)	-0.0393 (0.132)
High GCSEs	0.211*** (0.0298)	0.119*** (0.0364)	0.205*** (0.0423)	0.102* (0.0537)	0.220*** (0.0440)	0.126** (0.0539)
Low GCSEs	0.0994*** (0.0263)	0.0574* (0.0309)	0.0928*** (0.0357)	0.0517 (0.0431)	0.108*** (0.0401)	0.0679 (0.0474)
Other academic	-0.0195 (0.0223)	-0.0122 (0.0257)	-0.0330 (0.0372)	-0.0856* (0.0452)	-0.0146 (0.0281)	0.0271 (0.0321)
RSA level 3	-0.0527 (0.0529)	-0.0987 (0.0603)	-0.112 (0.231)	-0.195 (0.281)	-0.0531 (0.0538)	-0.109* (0.0609)
RSA level 2	0.00406 (0.0361)	0.0250 (0.0421)	-0.0554 (0.119)	-0.0823 (0.141)	0.0141 (0.0379)	0.0439 (0.0442)
RSA level 1	0.00716 (0.0247)	0.0122 (0.0284)	0.0300 (0.0565)	0.0790 (0.0672)	-0.00383 (0.0274)	-0.0174 (0.0314)
C&G level 3	0.0146 (0.0321)	0.0265 (0.0363)	0.0216 (0.0397)	0.0191 (0.0454)	-0.0162 (0.0607)	0.0261 (0.0703)
C&G level 2	-0.0311 (0.0263)	-0.0567* (0.0304)	-0.0114 (0.0341)	-0.0335 (0.0397)	-0.0701 (0.0432)	-0.100** (0.0510)
C&G level 1	-0.00713 (0.0197)	0.0142 (0.0224)	0.00706 (0.0269)	0.0238 (0.0312)	-0.0241 (0.0301)	-0.00260 (0.0346)
BTEC level 3	0.0979*** (0.0357)	0.0815** (0.0402)	0.115** (0.0519)	0.107* (0.0583)	0.0873* (0.0509)	0.0793 (0.0583)
BTEC level 2	0.0474 (0.0548)	0.0227 (0.0627)	0.0392 (0.0871)	0.0142 (0.101)	0.0448 (0.0716)	-0.00158 (0.0819)
BTEC level 1	-0.0104 (0.0298)	-0.00704 (0.0333)	-0.0316 (0.0441)	0.0170 (0.0505)	-0.00132 (0.0414)	-0.0217 (0.0458)
NVQ level 3	0.0228 (0.0348)	0.0580 (0.0397)	0.0346 (0.0491)	0.0659 (0.0592)	0.00294 (0.0510)	0.0400 (0.0561)
NVQ level 2	-0.0451 (0.0285)	-0.0293 (0.0322)	-0.00717 (0.0438)	0.0246 (0.0488)	-0.0837** (0.0385)	-0.0819* (0.0446)
NVQ level 1	-0.0353 (0.0301)	-0.0445 (0.0354)	-0.0586 (0.0444)	-0.0323 (0.0551)	-0.00975 (0.0419)	-0.0440 (0.0480)
Pitman level 3	0.104 (0.0701)	0.0363 (0.0846)	0.221 (0.237)	0.204 (0.310)	0.0881 (0.0733)	0.0468 (0.0875)
Pitman level 2	-0.0399 (0.0531)	-0.0452 (0.0592)	-0.0788 (0.214)	-0.0189 (0.313)	-0.0308 (0.0542)	-0.0650 (0.0597)
Pitman level 1	0.0508 (0.0316)	0.0549 (0.0365)	0.0711 (0.0981)	0.0329 (0.111)	0.0429 (0.0335)	0.0495 (0.0387)
Trade App	0.112*** (0.0373)	0.0951** (0.0419)	0.0948** (0.0409)	0.0953** (0.0463)	0.197 (0.130)	0.0571 (0.172)
Other voc'l	0.00128 (0.0170)	-0.0326* (0.0194)	-0.0246 (0.0241)	-0.0614** (0.0280)	0.0235 (0.0248)	-0.0113 (0.0282)
Married	0.0602*** (0.0177)	0.0577*** (0.0200)	0.0781*** (0.0270)	0.0888*** (0.0312)	0.0365 (0.0239)	0.0283 (0.0273)
Long-term illness	-0.0123 (0.0182)	6.39e-05 (0.0206)	-0.00667 (0.0270)	0.0121 (0.0313)	-0.0258 (0.0251)	-0.0172 (0.0285)
Part-time	-0.0697*** (0.0236)	-0.0660** (0.0270)	-0.115 (0.102)	-0.108 (0.125)	-0.0557** (0.0262)	-0.0476 (0.0297)
Private sector	0.0276 (0.0187)	0.0444** (0.0210)	0.0252 (0.0296)	0.0624* (0.0340)	0.0239 (0.0245)	0.0249 (0.0275)
Employer size: 10-24	0.00327 (0.0268)	0.00320 (0.0311)	-0.00278 (0.0402)	-0.0180 (0.0487)	0.00878 (0.0366)	0.0145 (0.0417)
Employer size: 25-99	0.0319 (0.0248)	0.0254 (0.0287)	0.0651* (0.0361)	0.0509 (0.0436)	-0.00970 (0.0348)	-0.0149 (0.0396)
Employ. size: 100-499	0.0713*** (0.0250)	0.0795*** (0.0290)	0.103*** (0.0374)	0.111** (0.0439)	0.0436 (0.0344)	0.0376 (0.0402)

Table 92: Average net wage returns, BCS 2004

Employer size: >500	0.141*** (0.0269)	0.155*** (0.0312)	0.158*** (0.0400)	0.179*** (0.0483)	0.121*** (0.0372)	0.117*** (0.0426)
Non-white	0.0186 (0.0715)	0.139 (0.0906)	-0.0324 (0.106)	0.0796 (0.143)	0.0702 (0.0996)	0.141 (0.122)
Experience	0.00153*** (0.000232)	0.00132*** (0.000269)	0.00182*** (0.000421)	0.00165*** (0.000490)	0.00122*** (0.000291)	0.000989*** (0.000340)
No. children 0-5	0.0218* (0.0125)	0.0200 (0.0143)	0.0154 (0.0172)	0.0240 (0.0198)	0.0230 (0.0194)	0.00385 (0.0222)
No. children 5-16	-0.0126 (0.0102)	0.00610 (0.0117)	0.00152 (0.0155)	0.0173 (0.0179)	-0.0325** (0.0149)	-0.0230 (0.0172)
Female	-0.116*** (0.0211)	-0.125*** (0.0242)				
FSM (age 10)		-0.0561** (0.0283)		-0.0589 (0.0446)		-0.0315 (0.0382)
Financial hardship		-0.0750** (0.0307)		-0.0598 (0.0475)		-0.0747* (0.0418)
Social class (i)		0.0370 (0.0715)		-0.0636 (0.108)		0.177* (0.0997)
Social class (ii)		-0.0633* (0.0365)		-0.102* (0.0553)		-0.0257 (0.0503)
Social class (iii manual)		-0.00904 (0.0292)		-0.0395 (0.0433)		0.0213 (0.0407)
Social class (iii non-man)		0.0709* (0.0403)		0.0445 (0.0585)		0.110* (0.0580)
Social class (iv)		-0.00523 (0.0352)		-0.0366 (0.0527)		0.0299 (0.0490)
Social class (v)		0.0293 (0.0496)		0.0891 (0.0699)		-0.0625 (0.0734)
Math score (age 10)		0.00310*** (0.00119)		0.00266 (0.00175)		0.00374** (0.00172)
Reading score (age 10)		0.00165 (0.00128)		0.00255 (0.00189)		0.000482 (0.00181)
Ability (age 10)		0.000682 (0.000772)		4.99e-05 (0.00106)		0.00124 (0.00120)
Father has degree		0.118*** (0.0431)		0.234*** (0.0620)		-0.0207 (0.0638)
Father has A-levels		0.0949** (0.0405)		0.122* (0.0622)		0.0679 (0.0545)
Mother has degree		-0.0379 (0.144)		-0.132 (0.191)		0.225 (0.245)
Mother has A-levels		-0.0429 (0.0634)		-0.00157 (0.0992)		-0.0508 (0.0845)
Father v. interested		0.0397 (0.0261)		0.0283 (0.0404)		0.0729** (0.0355)
Father mod. Interested		-0.0161 (0.0246)		-0.0201 (0.0363)		-0.00901 (0.0347)
Father v. little interest		-0.0342 (0.0565)		0.00146 (0.0839)		-0.0599 (0.0819)
Father uninterested		-0.110 (0.0745)		-0.00278 (0.120)		-0.207** (0.0979)
Mother v. interested		0.0178 (0.0295)		0.0280 (0.0439)		0.00371 (0.0413)
Mother mod. Interested		0.0182 (0.0286)		0.0160 (0.0425)		0.0263 (0.0405)
Mother v. little interest		0.0142 (0.0536)		-0.0500 (0.0741)		0.0801 (0.0827)
Mother uninterested		0.122 (0.0906)		-0.0174 (0.133)		0.235* (0.132)
Mother v. uninterested	0.0276 (0.0187)	0.0444** (0.0210)	0.0252 (0.0296)	0.0624* (0.0340)	0.0239 (0.0245)	0.0249 (0.0275)
Constant	1.459*** (0.0573)	1.286*** (0.0861)	1.378*** (0.0950)	1.227*** (0.138)	1.441*** (0.0763)	1.243*** (0.117)
N	1982	1532	980	760	1002	772
Adjusted R ²	0.188	0.232	0.134	0.222	0.171	0.203

Source: London Economics

Table 93: Employment returns (marginal effects), BCS 1996

	Males and females		Males		Females	
	No controls	With controls	No controls	With controls	No controls	With controls
1 A-level	-0.0614 (0.0380)	-0.0616 (0.0441)	-0.0180 (0.0436)	-0.0241 (0.0507)	-0.0840 (0.0549)	-0.0826 (0.0646)
2 or 3 AS levels	-0.0893 (0.122)	-0.0703 (0.134)	-0.173 (0.179)	-0.0840 (0.168)	-0.0116 (0.184)	-0.0290 (0.198)
1 AS level	0.0651 (0.0485)	0.0133 (0.0734)	-0.0504 (0.0991)	-0.0818 (0.119)	0.161*** (0.0439)	0.112 (0.0869)
High GCSEs	0.126*** (0.0153)	0.116*** (0.0195)	0.0582*** (0.0159)	0.0618*** (0.0182)	0.196*** (0.0247)	0.160*** (0.0330)
Low GCSEs	0.115*** (0.0196)	0.0988*** (0.0236)	0.0634*** (0.0205)	0.0551** (0.0236)	0.181*** (0.0323)	0.151*** (0.0394)
Other academic	0.0404** (0.0160)	0.0314* (0.0184)	0.0385** (0.0178)	0.0191 (0.0220)	0.0375 (0.0246)	0.0407 (0.0276)
RSA level 3	0.0643* (0.0335)	0.0490 (0.0421)			0.0616 (0.0499)	0.0400 (0.0617)
RSA level 2	0.0119 (0.0284)	0.0557** (0.0267)	-0.0553 (0.132)	-0.0530 (0.135)	0.00520 (0.0382)	0.0672* (0.0381)
RSA level 1	0.0207 (0.0192)	-0.00130 (0.0228)	-0.0225 (0.0441)	-0.0567 (0.0606)	0.0305 (0.0264)	0.00294 (0.0304)
C&G level 3	0.0246 (0.0264)	0.0365 (0.0280)	0.0131 (0.0239)	0.0157 (0.0248)	0.0120 (0.0531)	0.0686 (0.0498)
C&G level 2	0.0106 (0.0224)	-0.0121 (0.0277)	0.0237 (0.0191)	0.0243 (0.0207)	-0.0281 (0.0436)	-0.0916 (0.0570)
C&G level 1	0.00441 (0.0161)	-0.000855 (0.0183)	0.00408 (0.0166)	0.00362 (0.0181)	0.00287 (0.0265)	-0.0157 (0.0309)
BTEC level 3	0.0562** (0.0278)	0.0553* (0.0312)	0.00688 (0.0330)	0.0212 (0.0319)	0.108** (0.0424)	0.0924* (0.0512)
BTEC level 2	0.0535 (0.0426)	0.0461 (0.0481)	0.0517 (0.0392)	0.0153 (0.0696)	0.0605 (0.0654)	0.0770 (0.0672)
BTEC level 1	-0.00253 (0.0249)	-0.000839 (0.0277)	0.0384* (0.0215)	0.0310 (0.0238)	-0.0530 (0.0415)	-0.0459 (0.0463)
NVQ level 3	0.0418 (0.0466)	0.0290 (0.0545)	-0.0576 (0.0725)	-0.142 (0.112)	0.156*** (0.0489)	0.178*** (0.0385)
NVQ level 2	-0.0761* (0.0401)	-0.0727 (0.0457)	-0.176*** (0.0660)	-0.163** (0.0780)	0.0154 (0.0519)	-0.0115 (0.0629)
NVQ level 1	-0.0698* (0.0382)	-0.0714* (0.0434)	-0.0191 (0.0396)	-0.0269 (0.0461)	-0.126** (0.0605)	-0.117* (0.0677)
Pitman level 3	-0.0139 (0.0637)	-0.0236 (0.0796)			-0.0385 (0.0869)	-0.0899 (0.115)
Pitman level 2	0.0186 (0.0409)	0.00280 (0.0491)			0.0274 (0.0535)	0.0112 (0.0626)
Pitman level 1	-0.0149 (0.0266)	-0.00419 (0.0292)	-0.00647 (0.0732)	0.0376 (0.0472)	-0.0392 (0.0354)	-0.0275 (0.0397)
Trade App	0.0687** (0.0279)	0.0518 (0.0343)	0.0669*** (0.0164)	0.0532*** (0.0194)	-0.0877 (0.105)	-0.0932 (0.128)
Other voc'l	0.0479*** (0.0153)	0.0357** (0.0178)	0.0379** (0.0156)	0.0188 (0.0181)	0.0477* (0.0253)	0.0417 (0.0292)
Married	0.0724*** (0.0128)	0.0652*** (0.0146)	0.0784*** (0.0138)	0.0751*** (0.0147)	0.0408** (0.0201)	0.0371 (0.0229)
Long-term illness	-0.132*** (0.0201)	-0.122*** (0.0228)	-0.125*** (0.0268)	-0.113*** (0.0301)	-0.136*** (0.0291)	-0.128*** (0.0332)
Non-white	-0.146** (0.0596)	-0.0790 (0.0673)	-0.158* (0.0818)	-0.213* (0.113)	-0.141 (0.0891)	0.00773 (0.0934)
No. children 0-5	-0.147*** (0.00929)	-0.152*** (0.0108)	-0.0179 (0.0136)	-0.0214 (0.0149)	-0.228*** (0.0135)	-0.238*** (0.0161)
No. children 5-16	-0.0723*** (0.0146)	-0.0612*** (0.0170)	-0.0373** (0.0174)	-0.0333* (0.0189)	-0.116*** (0.0226)	-0.109*** (0.0267)
Female	-0.111*** (0.0129)	-0.110*** (0.0148)				
FSM (age 10)		-0.0296 (0.0221)		-0.0438 (0.0275)		-0.000585 (0.0323)

Table 93: Employment returns (marginal effects), BCS 1996

Financial hardship		-0.0441*		-0.0559*		-0.0245
		(0.0256)		(0.0318)		(0.0376)
Social class (i)		-0.0401		-0.0999		0.0498
		(0.0680)		(0.105)		(0.0861)
Social class (ii)		-0.0295		0.0108		-0.0603
		(0.0300)		(0.0292)		(0.0466)
Social class (iii manual)		0.00111		-0.0253		0.0157
		(0.0212)		(0.0254)		(0.0320)
Soc class (iii non-man)		0.0189		0.0105		0.0382
		(0.0300)		(0.0328)		(0.0445)
Social class (iv)		0.0131		-0.0229		0.0509
		(0.0252)		(0.0348)		(0.0355)
Social class (v)		0.0155		-0.0205		0.0527
		(0.0356)		(0.0464)		(0.0504)
Math score (age 10)		0.000799		0.00144		-0.000518
		(0.000930)		(0.000979)		(0.00147)
Reading score (age 10)		-0.00242**		-0.00329***		-0.000893
		(0.000988)		(0.00106)		(0.00156)
Ability (age 10)		0.00130**		0.00113*		0.00188**
		(0.000585)		(0.000592)		(0.000950)
Father has degree		0.0118		-0.0766		0.0675
		(0.0336)		(0.0563)		(0.0454)
Father has A-levels		0.0476*		0.0134		0.0802**
		(0.0280)		(0.0346)		(0.0407)
Mother has degree		0.0673				-0.00550
		(0.0824)				(0.181)
Mother has A-levels		-0.0127		-0.0568		0.0374
		(0.0554)		(0.0764)		(0.0770)
Father v. interested		0.0117		0.00585		0.00659
		(0.0203)		(0.0220)		(0.0320)
Father mod. interested		0.00544		0.0208		-0.00171
		(0.0192)		(0.0182)		(0.0308)
Father v. little interest		-0.0480		-0.0454		-0.0144
		(0.0484)		(0.0556)		(0.0696)
Father uninterested		-0.0147		-0.0759		0.0133
		(0.0605)		(0.0871)		(0.0898)
Mother v. interested		-0.00611		-0.00899		-0.00780
		(0.0228)		(0.0250)		(0.0353)
Mother mod. Interest		-0.00223		-0.0156		-0.00189
		(0.0219)		(0.0247)		(0.0341)
Mother v. little interest		0.0508		0.0332		0.0329
		(0.0323)		(0.0289)		(0.0599)
Mother uninterested		-0.0257		0.00685		-0.0575
		(0.0729)		(0.0545)		(0.131)
N	3756	2857	1589	1195	2155	1646

Source: London Economics

Table 94: Employment returns (marginal effects), BCS 2000

	Males and females		Males		Females	
	No controls	With controls	No controls	With controls	No controls	With controls
1 A-level	-0.0121 (0.0337)	-0.00195 (0.0375)	-0.0527 (0.0523)	-0.0388 (0.0530)	-0.00747 (0.0554)	0.0146 (0.0627)
2 or 3 AS levels	0.0579 (0.0773)	-0.0153 (0.144)			-0.0249 (0.205)	-0.0932 (0.248)
1 AS level	0.0256 (0.0549)	-0.0868 (0.103)	0.00126 (0.0565)	-0.0246 (0.0775)	0.0789 (0.0864)	-0.149 (0.172)
High GCSEs	0.0834*** (0.0161)	0.0334 (0.0237)	0.0459*** (0.0106)	0.0168 (0.0154)	0.131*** (0.0317)	0.0627 (0.0447)
Low GCSEs	0.0994*** (0.0199)	0.0541** (0.0231)	0.0349** (0.0154)	0.00687 (0.0146)	0.171*** (0.0355)	0.121*** (0.0437)
Other academic	0.0139 (0.0166)	0.0269 (0.0182)	0.0246* (0.0128)	0.0241** (0.0116)	-0.00183 (0.0292)	0.0279 (0.0324)
RSA level 3	-0.0425 (0.0458)	-0.0204 (0.0510)			-0.0731 (0.0656)	-0.0315 (0.0758)
RSA level 2	0.0297 (0.0237)	0.0462* (0.0245)			0.0306 (0.0398)	0.0596 (0.0437)
RSA level 1	0.00214 (0.0185)	-0.0129 (0.0217)	-0.0677 (0.0478)	-0.0575 (0.0514)	0.0174 (0.0291)	-0.0144 (0.0338)
C&G level 3	-0.0194 (0.0309)	-0.00515 (0.0331)	-0.0319 (0.0253)	-0.0206 (0.0241)	0.0128 (0.0569)	0.0304 (0.0618)
C&G level 2	0.0453** (0.0196)	0.0376 (0.0235)	0.0242* (0.0128)	0.0171 (0.0131)	0.0500 (0.0414)	0.0373 (0.0510)
C&G level 1	-0.0207 (0.0168)	-0.0199 (0.0189)	0.0127 (0.0114)	0.0127 (0.0111)	-0.0586* (0.0309)	-0.0626* (0.0354)
BTEC level 3	0.0118 (0.0309)	0.00978 (0.0368)	-0.00554 (0.0321)	-0.0143 (0.0410)	0.0187 (0.0554)	0.0110 (0.0680)
BTEC level 2	-0.0251 (0.0531)	0.00397 (0.0557)			-0.0723 (0.0853)	-0.0122 (0.0929)
BTEC level 1	-0.00219 (0.0243)	0.0126 (0.0256)	0.00483 (0.0190)	0.00503 (0.0181)	-0.00740 (0.0428)	0.0314 (0.0454)
NVQ level 3	0.0223 (0.0367)	0.0375 (0.0378)	0.000934 (0.0275)	0.00246 (0.0264)	0.0642 (0.0695)	0.116* (0.0663)
NVQ level 2	-0.0102 (0.0263)	-0.0128 (0.0298)	-0.0187 (0.0256)	-0.0214 (0.0265)	-0.0119 (0.0456)	-0.0177 (0.0532)
NVQ level 1	-0.0566* (0.0305)	-0.0608* (0.0346)	-0.0553 (0.0357)	-0.0563 (0.0398)	-0.0458 (0.0472)	-0.0600 (0.0540)
Pitman level 3	0.00229 (0.0541)	-0.00123 (0.0673)			0.00473 (0.0827)	0.00652 (0.103)
Pitman level 2	-0.0159 (0.0445)	0.00286 (0.0455)			-0.0125 (0.0645)	0.0198 (0.0685)
Pitman level 1	0.0329 (0.0209)	0.0255 (0.0244)			0.0374 (0.0355)	0.0262 (0.0415)
Trade App	0.0329 (0.0323)	0.0215 (0.0388)	0.0228 (0.0154)	0.0103 (0.0193)	-0.0426 (0.0989)	-0.0809 (0.123)
Other voc'l	0.0282** (0.0141)	0.0338** (0.0160)	0.0170 (0.0110)	0.0109 (0.0114)	0.0348 (0.0259)	0.0521* (0.0296)
Married	0.0767*** (0.0133)	0.0615*** (0.0152)	0.0473*** (0.0118)	0.0418*** (0.0125)	0.0877*** (0.0231)	0.0591** (0.0267)
Long-term illness	-0.111*** (0.0172)	-0.0890*** (0.0192)	-0.0840*** (0.0185)	-0.0546*** (0.0184)	-0.128*** (0.0275)	-0.110*** (0.0315)
Non-white	-0.0791 (0.0559)	-0.0218 (0.0588)	-0.116 (0.0722)	-0.116 (0.0889)	-0.0666 (0.0938)	0.0520 (0.0994)
No. children 0-5	-0.113*** (0.00825)	-0.111*** (0.00935)	-0.00746 (0.00756)	-0.00270 (0.00784)	-0.230*** (0.0148)	-0.231*** (0.0168)
No. children 5-16	-0.0678*** (0.00856)	-0.0555*** (0.00990)	-0.0147* (0.00831)	-0.0144* (0.00793)	-0.124*** (0.0145)	-0.107*** (0.0173)
Female	-0.187*** (0.0129)	-0.182*** (0.0150)				
FSM (age 10)		-0.00909 (0.0207)		-0.0337 (0.0215)		0.0306 (0.0342)

Table 94: Employment returns (marginal effects), BCS 2000

Financial hardship		-0.0183 (0.0239)		-0.0123 (0.0197)		-0.0210 (0.0415)
Social class (i)		0.0244 (0.0562)				0.00503 (0.110)
Social class (ii)		-0.0115 (0.0290)		-0.0147 (0.0258)		0.00119 (0.0496)
Social class (iii manual)		0.0310 (0.0204)		0.0150 (0.0158)		0.0377 (0.0361)
Soc class (iii non-man)		-0.00979 (0.0325)		-0.00556 (0.0265)		-0.0144 (0.0564)
Social class (iv)		0.00778 (0.0244)		0.00325 (0.0179)		0.0223 (0.0427)
Social class (v)		-0.0171 (0.0384)		-0.0263 (0.0365)		0.0115 (0.0638)
Math score (age 10)		0.00266*** (0.000923)		0.00235*** (0.000723)		0.00219 (0.00165)
Reading score (age 10)		-0.000870 (0.00100)		-0.000544 (0.000763)		-0.000899 (0.00178)
Ability (age 10)		0.000377 (0.000614)		-0.000505 (0.000482)		0.00137 (0.00110)
Father has degree		0.0429 (0.0321)		0.0134 (0.0199)		0.0767 (0.0626)
Father has A-levels		0.0215 (0.0306)		-0.0109 (0.0324)		0.0726 (0.0497)
Mother has degree						
Mother has A-levels		0.0769** (0.0341)		-0.0107 (0.0515)		0.163*** (0.0573)
Father v. interested		0.00916 (0.0204)		-0.0148 (0.0205)		0.0414 (0.0348)
Father mod. interested		0.0132 (0.0187)		0.00988 (0.0132)		0.0331 (0.0329)
Father v. little interest		-0.0405 (0.0451)		-0.0555 (0.0491)		0.0367 (0.0664)
Father uninterested		-0.00104 (0.0581)		-0.0448 (0.0658)		0.104 (0.0813)
Mother v. interested		0.0257 (0.0220)		0.0193 (0.0167)		0.0124 (0.0396)
Mother mod. Interest		0.0141 (0.0208)		-0.00401 (0.0161)		0.0130 (0.0380)
Mother v. little interest		0.0288 (0.0333)		0.0190 (0.0157)		-0.0369 (0.0778)
Mother uninterested		-0.0844 (0.0921)		-0.0144 (0.0481)		-0.161 (0.177)
N	3263	2484	1355	1021	1850	1404

Source: London Economics

Table 95: Employment returns (marginal effects), BCS 2004

	Males and females		Males		Females	
	No controls	With controls	No controls	With controls	No controls	With controls
1 A-level	-0.0426 (0.0391)	-0.0479 (0.0458)	-0.0572 (0.0521)	-0.0128 (0.0362)	-0.0556 (0.0629)	-0.106 (0.0783)
2 or 3 AS levels	0.0236 (0.0875)		-0.0428 (0.109)		0.148 (0.128)	
1 AS level	-0.0393 (0.0651)	-0.0803 (0.0894)			-0.129 (0.106)	-0.258* (0.142)
High GCSEs	0.0922*** (0.0166)	0.0623*** (0.0225)	0.0386*** (0.00901)	0.0222** (0.0107)	0.134*** (0.0347)	0.0914** (0.0461)
Low GCSEs	0.112*** (0.0210)	0.0852*** (0.0252)	0.0637*** (0.0171)	0.0352** (0.0168)	0.140*** (0.0367)	0.117** (0.0458)
Other academic	-0.000427 (0.0183)	0.00482 (0.0204)	0.0223** (0.0113)	0.0224** (0.00950)	-0.0194 (0.0314)	-0.0138 (0.0359)
RSA level 3	-0.0388 (0.0447)	0.0100 (0.0434)			-0.0728 (0.0653)	-0.0177 (0.0734)
RSA level 2	0.00373 (0.0276)	-0.00818 (0.0322)	-0.0815 (0.115)	-0.0567 (0.105)	0.00851 (0.0436)	-0.00589 (0.0503)
RSA level 1	0.0204 (0.0183)	0.0101 (0.0211)	-0.0369 (0.0347)	-0.0302 (0.0368)	0.0502* (0.0302)	0.0346 (0.0347)
C&G level 3	-0.0297 (0.0342)	-0.0429 (0.0392)	-0.0140 (0.0219)	-0.0334 (0.0278)	-0.0769 (0.0676)	-0.0733 (0.0760)
C&G level 2	0.0663*** (0.0194)	0.0686*** (0.0216)	0.0234** (0.0117)	0.0269*** (0.00996)	0.0948** (0.0405)	0.0928** (0.0472)
C&G level 1	-0.00579 (0.0169)	-0.0122 (0.0193)	0.000885 (0.0115)	0.0107 (0.0102)	-0.00103 (0.0305)	-0.0364 (0.0360)
BTEC level 3	-0.00252 (0.0340)	-0.0245 (0.0406)	-0.0519 (0.0381)	-0.0409 (0.0381)	0.0574 (0.0580)	0.0262 (0.0693)
BTEC level 2	0.105*** (0.0241)	0.108*** (0.0229)	-0.00216 (0.0427)	-0.0348 (0.0690)	0.221*** (0.0409)	0.243*** (0.0293)
BTEC level 1	0.0259 (0.0241)	0.0314 (0.0254)	0.0140 (0.0152)	0.0130 (0.0138)	0.0340 (0.0449)	0.0594 (0.0473)
NVQ level 3	0.0537** (0.0258)	0.0463* (0.0280)	-0.0125 (0.0263)	-0.0403 (0.0376)	0.125*** (0.0481)	0.119** (0.0512)
NVQ level 2	0.0369* (0.0208)	0.0332 (0.0237)	-0.00397 (0.0198)	-0.00234 (0.0181)	0.0851** (0.0362)	0.0861** (0.0416)
NVQ level 1	-0.0360 (0.0275)	-0.0367 (0.0314)	0.00150 (0.0190)	0.0105 (0.0153)	-0.0800* (0.0461)	-0.0914* (0.0532)
Pitman level 3	-0.00942 (0.0540)	0.0105 (0.0591)			-0.00502 (0.0815)	0.00866 (0.0977)
Pitman level 2	-0.0444 (0.0469)	-0.0450 (0.0526)			-0.0724 (0.0673)	-0.0732 (0.0770)
Pitman level 1	0.0329 (0.0212)	0.0259 (0.0247)	-0.0255 (0.0629)	-0.0523 (0.0790)	0.0512 (0.0357)	0.0435 (0.0415)
Trade App	0.0298 (0.0351)	0.00662 (0.0416)	0.00534 (0.0177)	-0.0117 (0.0222)	0.0156 (0.0993)	-0.0607 (0.128)
Other voc'l	0.0198 (0.0142)	0.0214 (0.0161)	0.0151 (0.00981)	0.00548 (0.0100)	0.0147 (0.0261)	0.0451 (0.0295)
Married	0.0492*** (0.0148)	0.0301* (0.0164)	0.0446*** (0.0132)	0.0382*** (0.0135)	0.0338 (0.0253)	-0.00417 (0.0286)
Long-term illness	-0.101*** (0.0165)	-0.101*** (0.0188)	-0.0488*** (0.0147)	-0.0305** (0.0144)	-0.151*** (0.0270)	-0.159*** (0.0314)
Non-white	-0.0309 (0.0544)	0.00569 (0.0632)	-0.0721 (0.0614)	-0.0369 (0.0625)	0.0267 (0.0899)	0.0667 (0.119)
No. children 0-5	-0.0890*** (0.00933)	-0.0925*** (0.0106)	0.00851 (0.00796)	0.00678 (0.00812)	-0.201*** (0.0170)	-0.203*** (0.0192)
No. children 5-16	-0.0405*** (0.00706)	-0.0370*** (0.00812)	-0.00594 (0.00601)	-0.0117** (0.00568)	-0.0900*** (0.0124)	-0.0740*** (0.0144)
Female	-0.219*** (0.0138)	-0.205*** (0.0159)				
FSM (age 10)		-0.0111 (0.0223)		-0.0524** (0.0244)		0.0448 (0.0371)

Table 95: Employment returns (marginal effects), BCS 2004

Financial hardship		-0.000312 (0.0243)		-0.00295 (0.0156)		0.00977 (0.0440)
Social class (i)		-0.0319 (0.0698)		-0.0793 (0.119)		-0.0366 (0.117)
Social class (ii)		-0.00299 (0.0293)		-0.0677 (0.0439)		0.0677 (0.0466)
Social class (iii manual)		0.0205 (0.0218)		-0.00104 (0.0165)		0.0529 (0.0384)
Soc class (iii non-man)		-0.000791 (0.0324)		-0.0421 (0.0405)		0.0504 (0.0532)
Social class (iv)		0.0248 (0.0248)		-0.0124 (0.0245)		0.0835** (0.0421)
Social class (v)		-0.0239 (0.0424)		-0.0444 (0.0474)		0.0460 (0.0642)
Math score (age 10)		0.00205** (0.000968)		0.00122* (0.000641)		0.00180 (0.00175)
Reading score (age 10)		-0.00198* (0.00104)		-0.000908 (0.000674)		-0.00325* (0.00190)
Ability (age 10)		0.000826 (0.000620)		-0.000310 (0.000431)		0.00292** (0.00117)
Father has degree		0.00709 (0.0373)		0.0141 (0.0140)		0.00457 (0.0717)
Father has A-levels		-0.0269 (0.0382)		0.00581 (0.0223)		-0.0672 (0.0664)
Mother has degree						
Mother has A-levels		0.0112 (0.0522)		0.00860 (0.0266)		-0.00122 (0.0994)
Father v. interested		-0.0127 (0.0221)		0.00162 (0.0143)		-0.00775 (0.0383)
Father mod. interested		0.0408** (0.0185)		0.0126 (0.0113)		0.0752** (0.0342)
Father v. little interest		-0.0341 (0.0465)		-0.0127 (0.0313)		-0.00413 (0.0764)
Father uninterested		0.000363 (0.0614)		-0.0320 (0.0597)		0.0811 (0.0959)
Mother v. interested		0.0410* (0.0227)		0.0198 (0.0141)		0.0425 (0.0416)
Mother mod. Interest		0.0111 (0.0221)		0.0162 (0.0125)		-0.00320 (0.0411)
Mother v. little interest		0.0537* (0.0303)		0.0205* (0.0110)		0.0556 (0.0681)
Mother uninterested		-0.0330 (0.0840)		0.0100 (0.0249)		-0.123 (0.171)
N	3047	2311	1327	1010	1700	1284

Source: London Economics

Annex 3 LFS Marginal regressions – Cell Sizes

Comparison group	Level (n-1) or below			No qualification			5+ GCSEs grades A*-C		
	Males	Females	All	Males	Females	All	Males	Females	All
RSA - level 3	32	257	289	9	55	64	6	83	89
C & G - level 3	8,441	638	9,079	3,134	170	3,304	1,549	171	1,720
BTEC - level 3	4,275	2,160	6,435	513	153	666	1,895	1,129	3,024
NVQ - level 3	3,259	3,732	6,991	711	706	1,417	949	1,295	2,244
RSA - level 2	39	189	228	18	55	73	10	88	98
C & G - level 2	5,348	625	5,973	2,415	217	2,632	922	212	1,134
BTEC - level 2	237	236	473	35	27	62	147	146	293
NVQ - level 2	3,392	3,497	6,889	1,254	1,302	2,556	844	1,226	2,070
RSA - level 1	182	1437	1619	Na	Na	Na	147	2261	2408
C & G - level 1	1,054	204	1,258	Na	Na	Na	373	135	508
BTEC - level 1	51	34	85	Na	Na	Na	84	78	162
NVQ - level 1	400	278	678	Na	Na	Na	221	220	441

Source: London Economics

Table 97: Cell sizes, Marginal returns by sector – Compared to level (n-1) or below

	RSA - level 3		C&G - level 3		BTEC - level 3		NVQ - level 3		RSA - level 2		C&G - level 2		BTEC - level 2		NVQ - level 2		RSA - level 1		C&G - level 1		BTEC - level 1		NVQ - level 1	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Agriculture & fishing	0	0	60	2	61	5	48	10	0	0	61	6	2	1	63	8	2	7	18	1	0	0	7	0
Energy & water	1	4	251	4	120	24	87	32	1	3	137	3	0	3	73	25	4	17	30	0	2	0	12	1
Manufacturing	4	28	3035	94	1311	263	770	326	14	25	2053	76	63	35	973	401	50	246	326	38	17	5	131	66
Construction	2	7	1703	6	310	40	471	66	3	5	799	7	17	6	426	51	10	57	143	2	6	0	49	1
Distribution, hotels & restaurants	5	26	1149	175	600	322	602	523	10	22	826	199	56	42	682	695	28	251	187	53	7	8	67	67
Transport & communication	7	12	647	26	390	129	270	180	5	8	524	30	27	11	332	133	31	66	120	3	7	1	45	4
Banking, finance & insurance etc	5	69	510	63	681	436	315	489	2	51	300	64	31	50	235	364	22	274	74	15	1	5	29	23
Public admin, education & health	7	99	873	205	675	825	576	1892	3	65	506	193	32	78	439	1597	23	457	120	83	8	13	43	102
Other services	1	12	208	63	124	114	120	210	1	10	134	47	8	9	168	220	12	61	36	9	2	2	17	13

M=Males; F=Females

Source: London Economics

Table 98: Cell sizes, Marginal returns by age band– Compared to level (n-1) or below

	RSA - level 3		C&G - level 3		BTEC - level 3		NVQ - level 3		RSA - level 2		C&G - level 2		BTEC - level 2		NVQ - level 2		RSA - level 1		C&G - level 1		BTEC - level 1		NVQ - level 1	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
16-20	2	3	56	9	167	134	338	346	1	2	53	12	27	21	456	442	3	5	16	6	1	3	29	20
21-25	2	12	298	42	462	396	791	854	2	14	235	46	52	61	700	683	3	23	50	12	8	1	55	23
26-30	1	26	649	83	672	480	671	599	5	19	497	92	51	61	550	437	9	29	67	17	6	3	43	19
31-35	6	32	997	88	711	357	436	368	5	21	744	104	38	37	398	345	15	63	121	15	9	2	40	23
36-40	5	31	1273	105	607	285	318	433	4	16	837	94	20	27	343	342	17	61	108	15	2	5	43	30
41-45	1	32	1496	106	514	219	264	380	4	31	829	92	23	12	327	387	11	181	148	30	5	7	47	44
46-50	1	50	1452	91	417	175	191	356	7	34	862	86	12	6	262	395	24	370	189	51	7	4	45	45
51-55	8	46	1190	77	355	84	156	263	7	38	688	69	10	7	183	289	55	424	168	41	5	7	38	47
56-60	4	25	764	37	260	30	73	133	3	14	451	30	4	4	130	177	39	281	132	17	8	2	43	27
61-64	2	.	266	.	110	.	21	.	1	.	152	.	.	.	43	.	6	.	55	.	.	.	17	.

M=Males; F=Females

Source: London Economics

Table 99: Cell sizes, Marginal returns – Place of attainment, selected vocational level 3

Comparison group	C&G - level 3		NVQ - level 3			
	L 2 or below	No quals.	L 2 or below		No qualifications	
	Males	Males	Males	Females	Males	Females
Solely through school college etc	1,369	478	618	787	95	88
Solely at place of work	363	154	623	789	183	210
Workplace and educ. Institution	3,064	1159	615	614	105	143
Government training	10	5	22	10	6	3
Some other way/don't know	66	20	44	32	16	5

Source: London Economics

Table 100: Cell sizes, Marginal returns – Place of attainment, selected vocational level 2

Comparison group	C&G - level 2		NVQ - level 2			
	L 1 or below	No quals.	L 1 or below		No quals.	
	Males	Males	Males	Females	Males	Females
Solely through school college etc	868	325	586	598	179	179
Solely at place of work	243	127	780	896	345	414
Workplace and educ. Institution	1,385	625	491	451	130	155
Government training	12	3	65	30	27	11
Some other way/don't know	47	34	42	35	21	8

Source: London Economics

Table 101: Cell Sizes, Marginal returns to NVQ level 2 qualifications – by place of attainment

	level 1				No Qualifications			
	1999-2002		2003-2009		1999-2002		2003-2009	
	Male	Female	Male	Female	Male	Female	Male	Female
Number NVQ2 school	210	199	376	399	55	54	124	125
Number NVQ2 workplace	244	286	536	610	110	139	235	275
Number NVQ2 combined	147	153	344	298	28	42	102	113
Number NVQ2 government	36	11	29	19	13	1	14	10
Number NVQ2 other	15	11	27	24	9	2	12	6
Observations	19,780	11,259	29,635	16,098	5,558	3,292	8,283	4,628
R-squared	0.253	0.242	0.214	0.205	0.221	0.161	0.170	0.125

Source: London Economics

Table 102: Cell sizes, Marginal returns – Place of attainment, selected vocational qualifications

	C&G - level 3				BTEC - level 3		NVQ – level 3				C&G - level 2				BTEC - level 2		NVQ – level 2				C&G - level 1		NVQ – level 1	
	L 2 or below		No quals.		L 2 or below		L 2 or below		No quals.		L 1 or below		No quals.		L 1 or below		L 1 or below		No quals.		No quals.		No quals.	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
15-16	109	9	24	2	59	35	51	49	2	6	101	16	40	4	6	9	94	93	13	9	40	6	16	4
17-18	613	137	205	31	664	495	463	438	50	26	560	127	213	25	57	51	515	490	96	62	89	15	32	17
19-20	1794	84	575	21	615	225	441	343	43	22	697	43	291	9	16	8	233	167	52	29	65	6	13	6
21-25	1364	36	542	5	411	100	315	361	49	40	397	14	186	5	10	8	251	199	78	60	62	4	27	9
26-30	136	16	49	7	115	54	189	197	49	33	82	16	32	9	3	5	191	147	75	52	21	4	24	9
>30	214	59	95	23	127	128	637	1101	246	358	193	64	111	37	18	10	859	1125	475	647	75	38	126	120

M=Males; F=Females

Source: London Economics

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