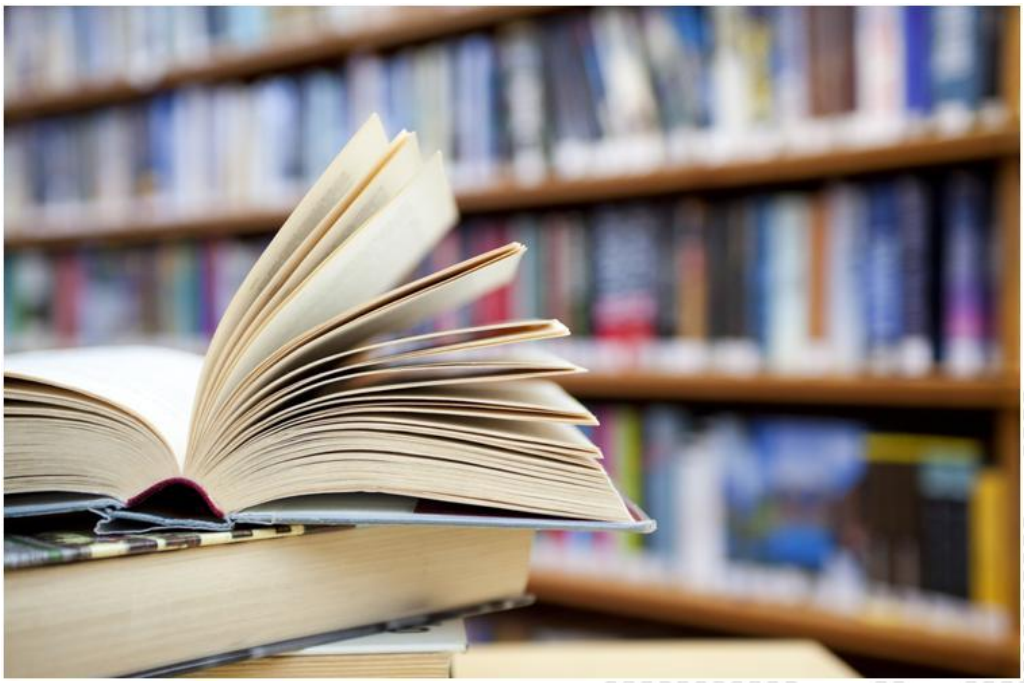
The earnings and employment returns to A levels

A report to the Department for Education



LE London Economics

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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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Disclaimer

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Table of Contents

Page

Executive summary/ Key findings

London Economics were commissioned by the Department for Education to undertake an analysis of the British Cohort Study (BCS70) to better understand the earnings and employment returns to GCE A levels. The focus of this report is on the returns to A levels by subject area. The BCS70 is an exceptionally rich source of data, and in addition to containing information on earnings and labour market outcomes over time, there is also information on the number, subject areas and grades of A level attainment. In addition, there is a wide selection of personal and socioeconomic information contained within the BCS70 that allows us to control for a range of characteristics that might impact earnings and employment outcomes, and correctly attribute earnings and employment returns to the qualifications themselves and not just those individuals in possession of those qualifications.

The **key messages** emerging from the analysis are as follows:

- Compared to GCSEs/O levels, **there are strong positive wage returns to A levels** – irrespective of whether the individual goes on to complete further or higher qualifications.
- **The wage returns are greater when a STEM A level is undertaken** compared to A levels in other subjects; however, for those individuals with **A levels as their *highest qualification***, there is no appreciable increase in earnings as further STEM specialisation occurs. In other words, for these individuals, **some degree of subject breadth at A level is associated with the greatest returns**. In contrast, **individuals who go on to attain further or higher qualifications see the greatest return associated with prior specialisation in STEM subjects**.

- Compared to GCSEs/O levels, for men whose highest qualification consists of a STEM A level at grade A-C, this premium amounts to approximately **£7,000** per annum between the ages of 29 and 42 (in 2014 prices).The corresponding estimate for women stands at **£4,500** per annum[1].

- **The earnings returns achieved by women are consistently greater than for men.**
- **For men, the grade of A level is important. For women, the grade of A level is less important than the choice of subject in determining earnings.**
- **Maths test scores at the age of 10 have a significant earnings impact later in life**, over and above the qualifications that individuals go on to attain**.**
- In general, the labour market impact of A levels is predominantly demonstrated through earnings rather than employment. Employment effects are generally small or not statistically significant.

[1] The reason why the monetary premium achieved by men is greater than that for women, despite the lower percentage return, relates to the fact that the baseline annual earnings achieved by men are substantially higher than for women

More detailed findings

For those individuals who indicated that **their highest qualification was an A level**, the analysis demonstrated in relation to **earnings** that:

- In the most comprehensive model specification (which controls for a wide range of personal characteristics, including test scores at the age of 10), across all individuals, the returns to 2 or more STEM A levels stand at **17.8%**, compared to returns of **20.3%** for 1 STEM A level and **5.3%** for non-STEM A levels, relative to those with GCSEs/O levels as their highest qualification (Table 3). In other words, possession of 1 STEM A level boosts earnings by approximately 15 percentage points compared to possession of non-STEM A levels. The analysis suggests that **some degree of subject breadth at A level delivers the greatest wage returns**.
- **Earnings premiums are higher for women than for men**. Compared to GCSEs/O levels, men achieving 2 or more STEM A levels have a (non-statistically significant) earnings return of around **7.8%, while** for women, the corresponding estimate is **33.1%**. Men with 1 STEM A level have an (insignificant) return of **13.8%** compared to **29.4%** for women, while for non-STEM A levels, men have a small negative and insignificant return, compared to a return of **21.9%** for women (Table 4 and Table 5).
- **Men with A levels at grades A-C achieve a significant earnings premium** (**over 10%**) compared to those without (Table 4). Given that more than 80% of A level holders have at least one good A level, these premiums are *additional* to the estimated returns to holding A levels in different subject areas. This yields an earnings return of around **20%** for men in possession of 2 or more STEM A levels and **25%** for those in possession of 1 STEM A level. For women, there is no earnings premium to holding an A level at grades A-C (Table 5).
- Even after accounting for holding A level qualifications, **pupils performing well on maths tests at the age of 10 earn more later in life**. Compared to scoring in the lowest maths test quartile at age 10, a female in the top quartile earns a **23.9%** premium, while a male achieves a **12.5%** premium (Table 17 and Table 16).
- In terms of employment outcomes, **there are no statistically significant employment effects** associated with A levels relative to GCSEs/O levels. Although females with 2 or more STEM A levels or non-STEM A levels have positive employment effects of around **7-8 percentage points** compared to individuals with GCSEs/O levels, the results are never statistically significant (Table 8). For men, the employment effects are close to zero and insignificant (Table 7).

For **all individuals with A levels** (*whether held as their highest qualification or not*), the analysis indicated that

- In the most comprehensive specification (controlling for early test scores), across both men and women *holding three or more A levels*, the earnings premium for 2 or more STEM A levels stand at **13.1%**, compared to **5.9%** for one STEM A level, and **4.8%** for no STEM A levels relative to those with GCSEs/O levels. Possession of 2 or more STEM A levels boost earnings by approximately 8.5 percentage points compared to possession of non-STEM A levels. The analysis suggests that **STEM specialisation, rather than subject breadth, generates a higher return for those with at least 3 A levels** who progress to higher level qualifications (Table 9).
- The **earnings premiums are much stronger for women than for men**. For those with 2 or more STEM A levels (*and three or more A levels in total*), men achieve a (non-statistically significant) earnings return of around **7.9%**, compared to a **23.7%** return for women (Table

10 and Table 11). The picture is similar also for individuals with 1 STEM A level or non-STEM A levels (*and three or more A levels in total*). The combination of STEM subject areas and A levels at grade A-C provide significant returns especially to men, with earnings premiums standing at between **15%** and **20%** (while for those with at least 3 A levels in non-STEM subject areas, the returns are around **10%**).

- Again, **maths test scores at the age of 10 have a significant impact on earnings later in life**, over and above the qualifications that individuals go on to attain. Compared to an individual in the lowest maths test score quartile aged 10, a female in the top quartile earns a **23.5%** premium, while a male achieves an **11.2%** premium (Table 23 and Table 22).
- In terms of employment outcomes, there are **no statistically significant employment effects** associated with achieving A levels relative to GCSE/O levels. Although there is some evidence that males with 2 or more STEM A levels (*with three or more A levels in total*) have positive employment effects, these results are weakly significant and disappear when we combine subject areas with A level grade (Table 13).
- **Maths test scores at the age of 10 provide a significant *employment* boost to both men and women**. Compared to the bottom quartile, a female in the top quartile achieves as a **6.6 percentage point** employment boost, while a male in the second from highest quartile achieves a **2.6 percentage point** boost (Table 26 and Table 25).

1 Methodological approach

To undertake this analysis, we estimated the earnings and employment returns to holding A levels by subject area following two different approaches:

- An estimation of the economic returns to **A levels** when they are **held as highest qualification ("marginal effects").** The comparison group is formed of individuals holding 'good' GCSE/O levels as highest qualification. These are defined "marginal effects", as they capture the additional earning and employment returns of moving one step up in the National Qualification Framework.
- An estimation of the economic returns to **A levels irrespective of whether they are held as highest qualification or not ("average effects").** All individuals with at least 'good' GCSE/O levels are included in the regressions and the estimated coefficients provide the earnings and employment returns to holding A levels by subject area (whether as the highest qualification or not). These are defined "average effects", as they provide an estimate of the additional earning and employment returns to holding A levels.

Below, we provide details on the models used in the estimation of the wage and employment equation and on the different sets of control variables included in the different specifications.

Data used

All data came from the British Cohort Study (BCS70). The BCS70 follows individuals born in England, Scotland and Wales in a single week of 1970 and contains information on health, physical, educational social development, economic and labour market circumstances and other characteristics (e.g. early cognitive measures). Labour market returns were estimated using BCS70 sweeps at the ages of 29, 34, 38 and 42. Variables providing information on family and child characteristics were taken from the earlier BCS70 waves. Due to sample size restrictions we pooled together data contained in all four sweeps (see Table 2). To avoid losing observations due to missing values in some of the control variables, we generated additional categories to control for the presence of missing values.

Definition of STEM subjects

In terms of the definition of the STEM grouping of subjects, this consisted of the following: *Maths and Statistics; Biology and Other Sciences; Chemistry; Engineering and Electronics (including very small number of Building and Construction); Information and Communications Technology*; and *Physics*. Non-STEM subjects included the following: *Accounting and Business studies; Art and Design; Classical Studies; Economics; English Language and Literature; General Studies; Geography; Health and Social Care; History; Home Sciences; Law; Media and communication; Modern Languages; Politics; Psychology; Religious Studies and Philosophy; Social Studies; Sociology; Sports Studies*; and *Welsh*.

Wage returns

We adopted a standard OLS linear regression model, where the dependent variable is the natural logarithm of weekly earnings and the independent variables include a set of personal and other characteristics (full details below). We included individuals who are employed (including self-employed) on either a full-time or part-time basis. The basic specification of the model is defined as follows:

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

where ln(ω) represents the natural logarithm of weekly earnings and X provides the independent variables included in the analysis (described below).

Employment outcomes

We adopted a probit model to estimate the likelihood of A levels holders being in employment or otherwise. The specification defines an individual's labour market outcome to be either in employment or not in employment (using the standard ILO definition).

The model specification is as follows:

$$probit(EMPNOT) = \alpha + \gamma\text{^}'Zi + \varepsilon\_i$$

The dependent variable adopted has the binary variable *EMPNOT* that is coded 1 if the individual is in employment and 0 otherwise. The control variables included in the regression (represented by Z_i in the equation) capture personal and family characteristics as described below, clearly excluding any job-related characteristics.

Model specifications

The BCS70 provide a rich and comprehensive set of personal and family characteristics. In the analysis we started with a basic set of control variables (including contemporaneous and time-invariant characteristics), then enriched the set of control variables to include family and child background characteristics gathered in the early BCS waves. Finally, the third specification also included maths and reading test scores measured when respondents were aged 10[2]. All specifications were estimated in aggregate and disaggregated by gender.

Table 1: Model specifications and sets of control variables

Variables	Specification 1 – Basic Set	Specification 2 - Family and Child Background	Specification 3 - Family and Child Background/ Age 10 test scores
A level subject areas			
2 or more STEM A levels	v	v	v
1 STEM A level	v	v	v
Other non-STEM combinations	v	v	v
Other A level/education characteristics			
Number of A levels (3 or more/2 or less)*	v	v	v
Any A levels at grade A-C	v	v	v
Highest qualification held**	v	v	v
Personal characteristics			
Gender	v	v	v
Ethnic Origin	v	v	v
Part-time employment***	v	v	v
Marital status	v	v	v
Region of residence	v	v	v
Family and Child characteristics			
Low birth weight (less than 2.5 kg)		v	v
Whether family owned house at age 10		v	v
Parental occupation at age 10		v	v
Father school leaving age		v	v
Mother school leaving age		v	v
Age of mother at birth		v	v
Early test scores			
Reading test scores at age 10			v
Maths test scores at age 10			v
Time dummies	v	v	v

Note: *A level subject areas and number of A levels are explicitly combined in the average effects regressions **Only in the specifications estimating average effects. *** Only in the wage regressions

Due to the policy interest in specific subject area combinations (and in part as a result of the fact that the sample sizes associated with specific A level subject areas was particularly limited), we generated three different variables identifying individuals holding A levels in different subject areas:

[2] Further information on the maths and reading tests administered to the BCS70 cohort at the age of 10 can be found (here)

- Individuals holding 2 or more A levels in STEM subjects (Science, Technology, Engineering and Maths) and possibly A levels in other areas.
- Individuals holding 1 A level in a STEM subject area (possibly combined with other A levels).
- Individuals holding A levels in other (non-STEM) subject areas.

In the estimation of "average" returns, these three categories identifying A level subject areas were explicitly combined with the number of A levels held ('3 or more' and '2 or fewer') to generate six categories. Due to sample size restrictions, in the estimation of marginal returns we could not combine explicitly the subject areas with the number of A levels, but included the two sets of variables separately as explanatory variables. The samples available for the regression analysis were as follows:

Table 2: Sample sizes

Earnings Regression	Male	Female	Total
A levels as highest qualification			
2+ STEM A levels	120	63	183
1 STEM A level	176	79	255
No STEM A level	282	428	710
All with A levels			
2+ STEM A levels/ 3+ total A levels	988	490	1,478
2 STEM A levels/ 2 total A levels	135	62	197
1 STEM A level/ 3+ total A levels	240	403	643
1 STEM A level/ 1-2 total A level	290	159	449
No STEM A level/ 3+ total A levels	405	732	1,137
No STEM A level/ 1-2 total A levels	484	860	1,344

Employment Regression	Male	Female	Total
A levels as highest qualification			
2+ STEM A levels	162	98	260
1 STEM A level	237	138	375
No STEM A level	400	670	1,070
All with A levels			
2+ STEM A levels/ 3+ total A levels	1,259	731	1,990
2 STEM A levels/ 2 total A levels	180	92	272
1 STEM A level/ 3+ total A levels	321	570	891
1 STEM A level/ 1-2 total A level	385	238	623
No STEM A level/ 3+ total A levels	567	1,093	1,660
No STEM A level/ 1-2 total A levels	669	1,315	1,984

Note: sample sizes for respondents reporting subject areas of A levels

General interpretation of coefficients

As is general practice in the area, for the earnings returns, the actual coefficients from the regression are presented in the various tables in the report, while the precise percentage effect of the independent variable on the earnings outcomes is presented in the text (by transforming the β coefficient in the regressions using the transformation e^{β} -1). This transformation is required as we are estimating the impact of qualification attainment on the logarithm of weekly earnings (and presented in percentages). No exponential transformation is necessary when considering the employment outcomes of learners, as the relevant coefficient provides an automatic estimate of the impact of the qualification on the probability of being in employment (stated in percentage points).

Combining coefficients - subject of study and grade of A level

The regressions also control for whether individuals also hold at least one A level at grades A-C. As the vast majority of individuals holding A levels have at least one at grade A to C (at least *three quarters* do – more so in the case of those with STEM subjects), the returns to holding A levels should be thought of as the sum of the returns to holding at least one A level at grades A-C *and* the A level subject.

2 Findings

2.1 A levels as highest qualification

In this section, we consider the earnings and employment returns when A levels are the highest qualification. Results are presented in aggregate (across men and women (Table 3 for earnings and Table 6 for employment)) and then for men (Table 4/ Table 7) and women separately (Table 5/Table 8).

Aggregated analysis

- There are **strong positive earnings returns** to A levels. In the basic specification, where basic personal and regional characteristics were incorporated into the model specifications, the earnings premium associated with having 2 or more STEM A levels stood at **27.4%** compared to O levels/GCSEs. The earnings premium associated with the possession of one STEM subject was slightly higher (though not statistically significantly different), standing at **32%.** Possession of non-STEM A levels enhanced earnings by an average of **13.2%**. All results were statistically significant (Table 3).
- As further control variables are added to the model to explain respondent characteristics, earnings premiums decline. In the most comprehensive specification, where parental characteristics and maths/reading test scores aged 10 are included in the analysis, the return to 2 or more STEM A levels stands at **17.8%**, compared to returns of **20.3%** for 1 STEM A level (though not statistically significantly different) and **5.3%** for non-STEM A levels (Table 3).

Disaggregated analysis – gender and subject specialisation

- **The earnings returns to women are greater when a STEM A level is undertaken** (compared to no STEM A levels); however, there is no appreciable increase in earnings returns as further STEM specialisation occurs. In other words, for those who are in possession of A levels as their highest qualification, **some degree of subject breadth at A level is associated with the greatest earnings returns** (Table 4 and Table 5).
- In the regression with all control variables, for those in possession of 2 or more STEM A levels, men achieve a non-statistically significant earnings return (around **7.8%**), compared to a **33.1%** return for women. The picture is similar also for individuals in possession of 1 STEM A level, where the returns stand at **13.8%** for men (statistically insignificant) compared to **29.4%** for women. For non-STEM A levels, men post a small negative return of **-4%** (statistically insignificant) compared to **21.9%** for women (Table 4 and Table 5).

Disaggregated analysis – gender and grade of GCE 'A level

- **For men in particular, the grade of A level is important.** Specifically, earnings returns to holding A levels at grades A-C are positive and large for men (around **12%**), and the package of having STEM A levels at grades A-C provide sizeable returns to men (around **20-25%**). **For women, the grade of A level is less important in determining earnings compared to the choice of subject** (Table 4 and Table 5).

Maths Test scores age 10

- The analysis also demonstrates the importance of controlling for **maths test scores at the age of 10**. Compared to an individual in the lowest maths test score quartile, a female in the top quartile earns a **23.9%** premium (Table 17), while a male achieves a **12.5%** premium (Table 16).

Employment

- In terms of employment outcomes, the analysis indicates that in general, there are **no statistically significant employment effects** associated with the possession of A levels relative to GCSE/O levels. Although females in possession of 2 or more STEM A levels or non-STEM A levels have

positive employment effects of around **7-8 percentage points** compared to individuals in possession of O levels/ GCSEs, results are never statistically significant (Table 8).

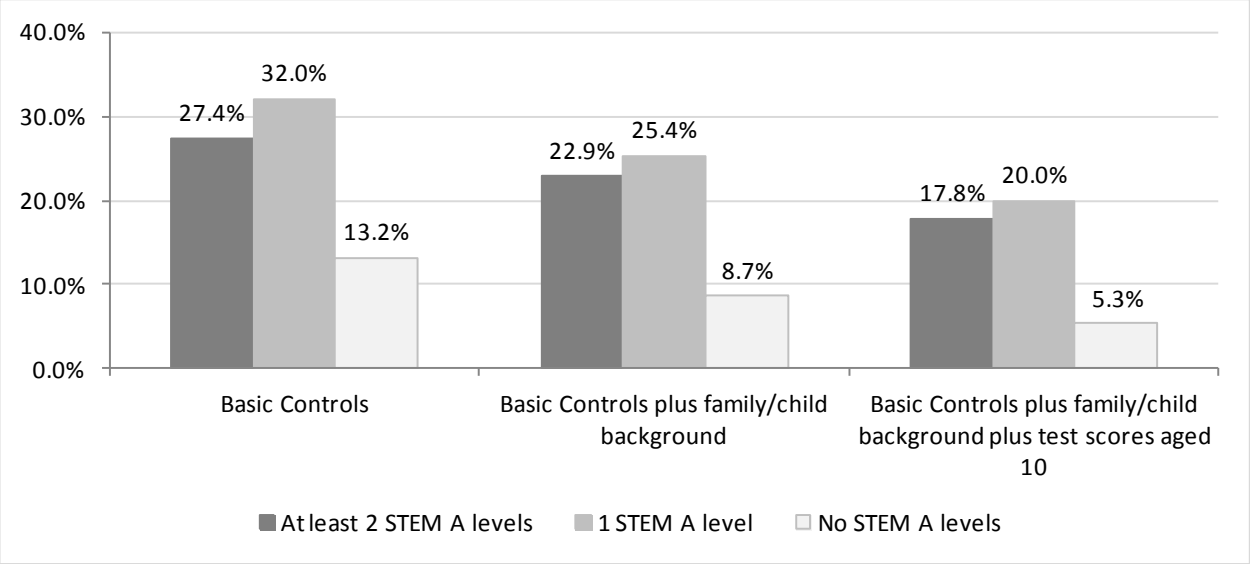
- Again, maths test scores at the age of 10 provide a significant **employment boost to both** men and women. Compared to the bottom quartile, a female in the top quartile achieves as a **12.8 percentage point** boost (Table 20), while a male in the third or top quartile achieves a **5 percentage point** boost (Table 19).

Table 3: Earnings returns associated with A levels (Summary - Men and women combined)

Control Variable	Basic Controls	Family and Child Background	Family and Child Background/ Age 10 Maths/ reading scores
At least 2 STEM A levels	0.242***	0.206***	0.164**
	(0.063)	(0.065)	(0.066)
1 STEM A level	0.278***	0.226***	0.182**
	(0.081)	(0.081)	(0.082)
No STEM A levels	0.124*	0.083	0.052
	(0.067)	(0.066)	(0.066)
Fewer than 3 A levels	0.032	0.048	0.052
	(0.058)	(0.058)	(0.057)
At least 1 A level at grade A-C	0.037	0.033	0.043
	(0.046)	(0.046)	(0.046)
Female	-0.320***	-0.315***	-0.317***
	(0.017)	(0.017)	(0.017)
Observations	8,489	8,489	8,489
R-squared	0.487	0.498	0.504

Note: Standard errors clustered at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Source: London Economics' analysis of BCS70 data

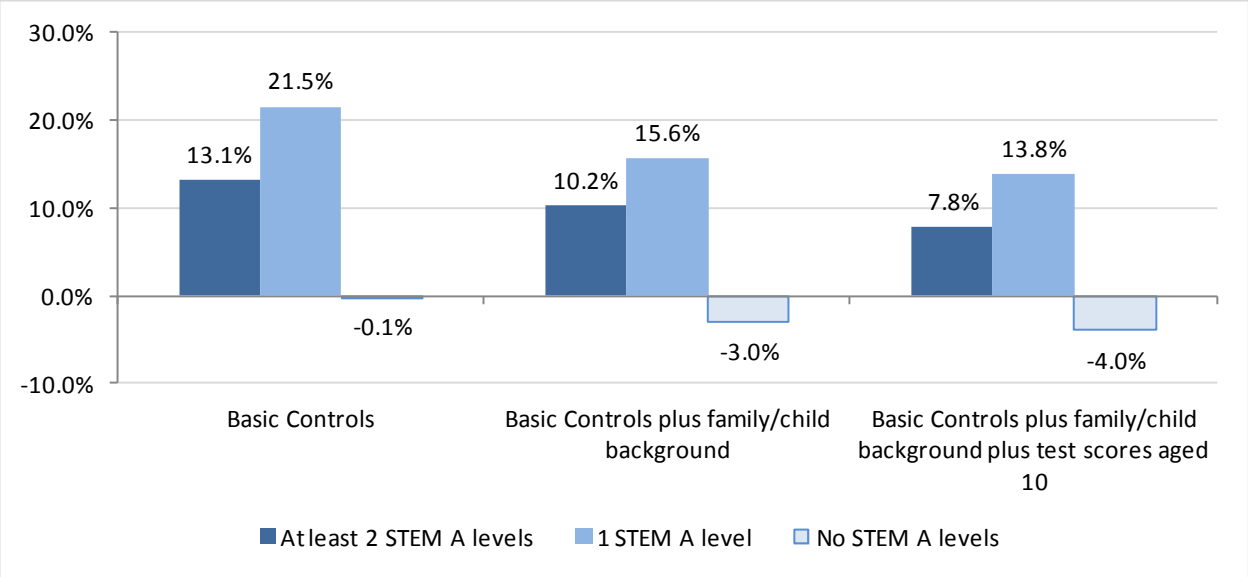


Source: London Economics' analysis of BCS70 data

Table 4: Earnings returns associated with A levels (Summary results -Men)

Control Variable	Basic Controls	Family and Child Background	Family and Child Background/ Age 10 Maths/ reading scores
At least 2 STEM A levels	0.123	0.097	0.075
	(0.087)	(0.083)	(0.083)
1 STEM A level	0.195*	0.145	0.129
	(0.111)	(0.108)	(0.110)
No STEM A levels	-0.001	-0.030	-0.041
	(0.097)	(0.093)	(0.091)
Fewer than 3 A levels	0.107	0.108	0.102
	(0.082)	(0.080)	(0.080)
At least 1 A level at grade A-C	0.112	0.107	0.113*
	(0.069)	(0.065)	(0.065)
Observations	4,134	4,134	4,134
R-squared	0.273	0.298	0.306

Note: Standard errors clustered at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
Source: London Economics' analysis of BCS70 data

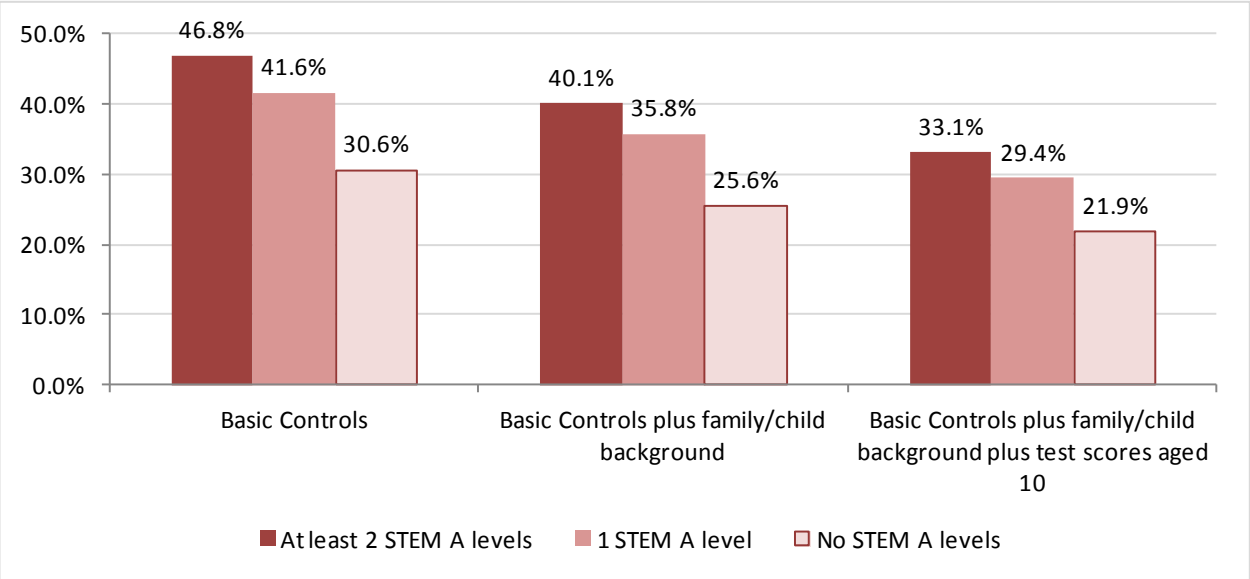


Source: London Economics' analysis of BCS70 data

Table 5: Earnings returns associated with A levels (Summary results -Women)

Control Variable	Basic Controls	Family and Child Background	Family and Child Background/ Age 10 Maths/ reading scores
At least 2 STEM A levels	0.384***	0.337***	0.286***
	(0.091)	(0.098)	(0.098)
1 STEM A level	0.348***	0.306***	0.258**
	(0.117)	(0.118)	(0.116)
No STEM A levels	0.267***	0.228***	0.198**
	(0.084)	(0.086)	(0.084)
Fewer than 3 A levels	-0.066	-0.047	-0.033
	(0.077)	(0.076)	(0.074)
At least 1 A level at grade A-C	-0.032	-0.037	-0.043
	(0.058)	(0.061)	(0.061)
Observations	4,355	4,355	4,355
R-squared	0.420	0.431	0.440

Note: Standard errors clustered at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
Source: London Economics' analysis of BCS70 data



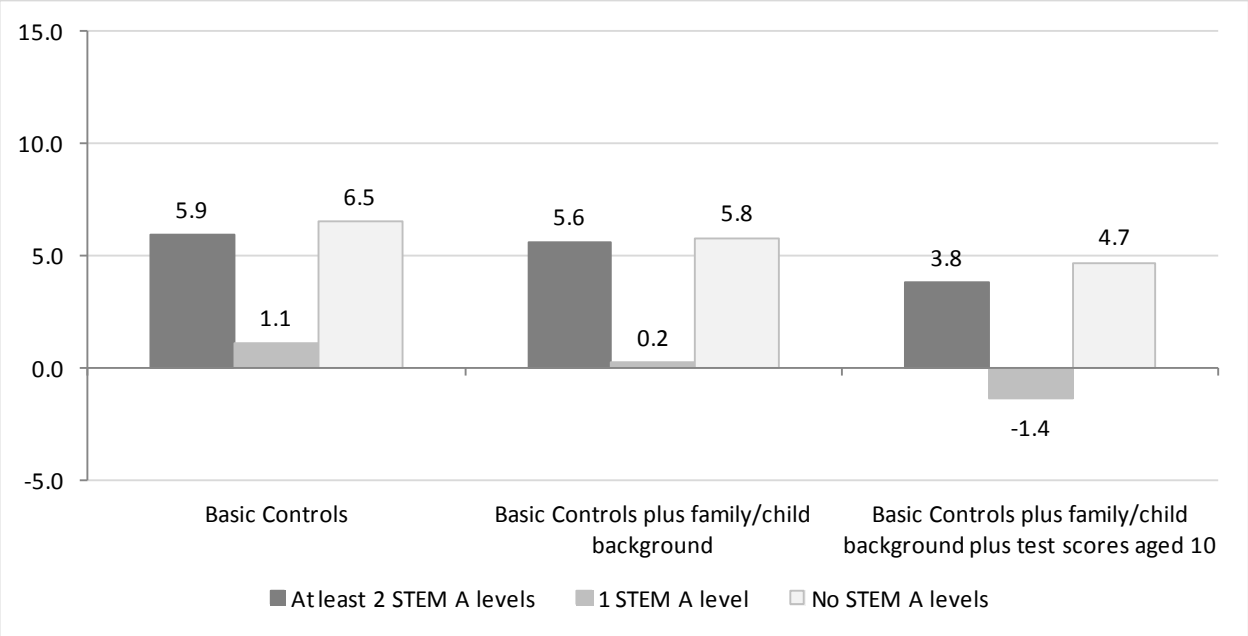
Source: London Economics' analysis of BCS70 data

Table 6: Employment returns associated with A levels (Summary results - Men and women combined)

Control Variable	Basic Controls	Family and Child Background	Family and Child Background/ Age 10 Maths/ reading scores
At least 2 STEM A levels	0.059	0.056	0.038
	(0.038)	(0.038)	(0.038)
1 STEM A level	0.011	0.002	-0.014
	(0.035)	(0.036)	(0.036)
No STEM A levels	0.065*	0.058	0.047
	(0.035)	(0.036)	(0.035)
Fewer than 3 A levels	-0.007	-0.007	-0.004
	(0.028)	(0.028)	(0.027)
At least 1 A level at grade A-C	-0.045	-0.041	-0.038
	(0.030)	(0.030)	(0.029)
Female	-0.165***	-0.164***	-0.163***
	(0.008)	(0.008)	(0.008)
Pseudo R-squared	0.073	0.080	0.087
Observations	12,975	12,975	12,975

Note: Reporting marginal effects. Standard errors clustered at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Source: London Economics' analysis of BCS70 data



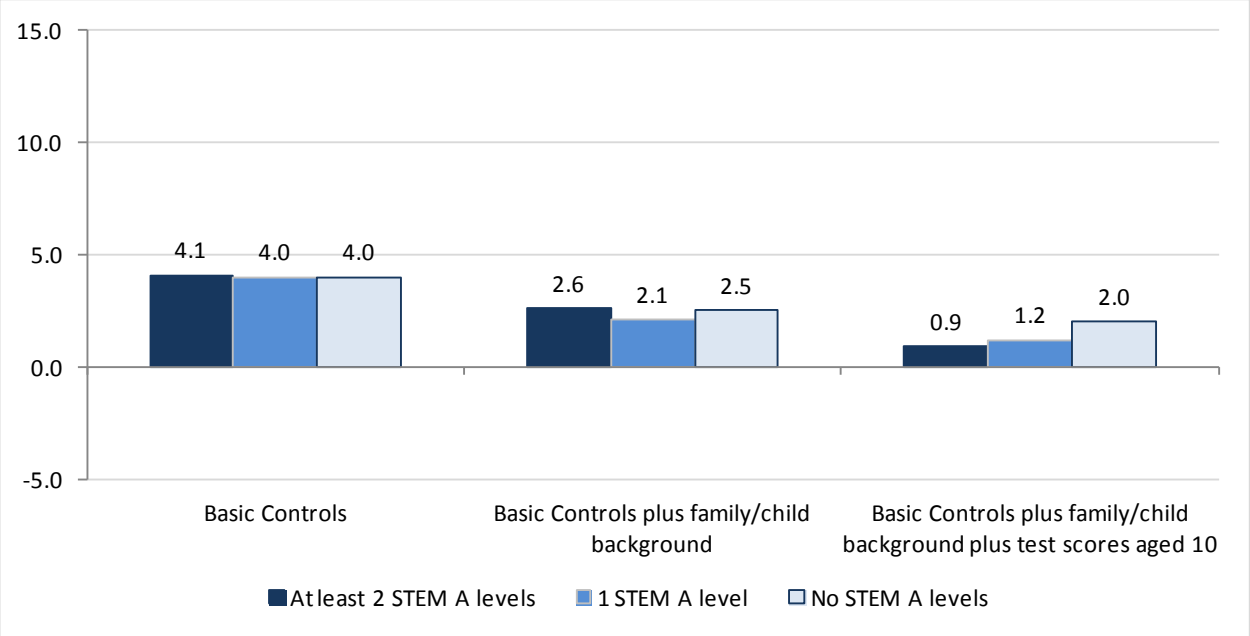
Source: London Economics' analysis of BCS70 data

Table 7: Employment returns associated with A levels (Summary results -Men)

Control Variable	Basic Controls	Family and Child Background	Family and Child Background/ Age 10 Maths/ reading scores
At least 2 STEM A levels	0.041	0.026	0.009
	(0.038)	(0.036)	(0.036)
1 STEM A level	0.040	0.021	0.012
	(0.034)	(0.032)	(0.032)
No STEM A levels	0.040	0.025	0.020
	(0.032)	(0.031)	(0.030)
Fewer than 3 A levels	-0.020	-0.013	-0.015
	(0.028)	(0.026)	(0.026)
At least 1 A level at grade A-C	-0.047	-0.033	-0.026
	(0.036)	(0.031)	(0.029)
Pseudo R-squared	0.057	0.076	0.087
Observations	5,980	5,980	5,980

Note: Reporting marginal effects. Standard errors clustered at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Source: London Economics' analysis of BCS70 data



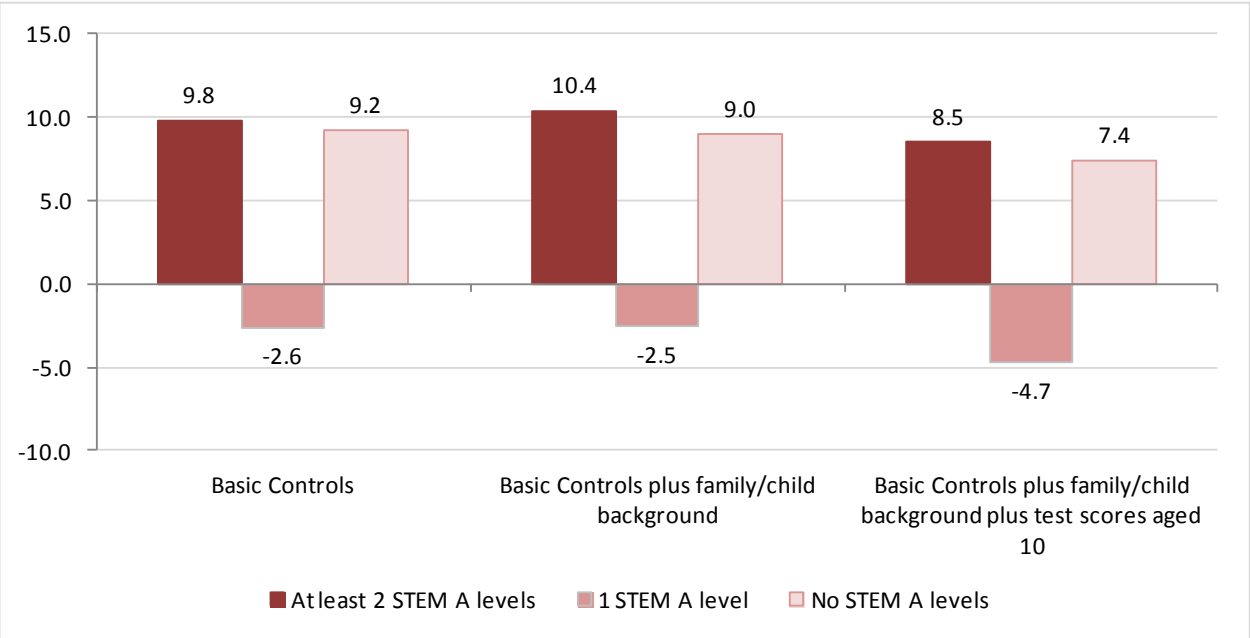
Source: London Economics' analysis of BCS70 data

Table 8: Employment returns associated with A levels (Summary results -Women)

Control Variable	Basic Controls	Family and Child Background	Family and Child Background/ Age 10 Maths/ reading scores
At least 2 STEM A levels	0.098	0.104	0.085
	(0.065)	(0.063)	(0.064)
1 STEM A level	-0.026	-0.025	-0.047
	(0.061)	(0.061)	(0.061)
No STEM A levels	0.092	0.090	0.074
	(0.061)	(0.062)	(0.062)
Fewer than 3 A levels	-0.003	-0.010	0.000
	(0.047)	(0.048)	(0.047)
At least 1 A level at grade A-C	-0.045	-0.044	-0.045
	(0.047)	(0.047)	(0.047)
Pseudo R-squared	0.014	0.021	0.028
Observations	6,995	6,995	6,995

Note: Reporting marginal effects. Standard errors clustered at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Source: London Economics' analysis of BCS70 data



Source: London Economics' analysis of BCS70 data

2.2 Average earnings and employment returns to A levels by subject area

In this section, we consider the returns to A levels when individuals may go on to complete further or higher qualifications (approximately 73% of total). As before, results are presented in aggregate across men and women (Table 9 for earnings and Table 12 for employment). We then present the corresponding results for men (Table 10 and Table 13) and women (Table 11 and Table 14). In these specifications, we include all respondents with 5 or more GCSE at grades A*-C/O levels or above as highest qualification. Due to the increased sample size, we were able to combine the A levels subject areas with the number of A levels to generate six different categories: 3 subject areas (2+ STEM A levels, 1 STEM A levels, no STEM A levels) combined with 2 categories for number of A levels possessed (3+ A levels/2 or fewer A levels).

Aggregated analysis

For all those who indicated that their *they completed* an A level, the analysis demonstrated in relation to **earnings** that

- In the basic specification, *for those individuals in possession of three or more A levels*, the earnings premium associated with having 2 or more STEM A levels stood at **18.1%** compared to O levels/GCSEs, compared to **10.5%** associated with one STEM subject, and **8.3%** associated with no STEM subjects. In the most comprehensive specification, the returns stand at **13.1%**, **5.9%** and **4.8%** respectively (Table 9).
- *For those individuals in possession of 2 (or fewer) A levels*, in the most comprehensive specification, the earnings premium associated with having 2 STEM A levels stood at **3.1%** relative to O levels/GCSEs, compared to **6.6%** associated with one STEM subject, and **-6.3%** associated with no STEM subjects (Table 9).

Disaggregated analysis – gender and subject specialisation

- The earnings premiums are much stronger for women than for men.
  - In the regression with all control variables, for those in possession of 2 or more STEM A levels (*and three or more A levels in total*), men achieve a non-statistically significant earnings return (around **7.9%**), compared to a **23.7%** return for women (Table 10 and Table 11).
  - The picture is similar for individuals in possession of 1 STEM A level (*and three or more A levels in total*), where the returns stand at **3.3%** for men compared to **8.8%** for women.
  - For non-STEM A levels (*and three or more A levels in total*), men post a small negative return of **-0.5%** (statistically insignificant) compared to **10.2%** for women (Table 10 and Table 11).
  - In other words, for women going on to complete further of higher qualifications, there appears to be a premium associated with A level STEM subject specialisation.

Disaggregated analysis – gender and grade of A level

- For men, the grade of A level has a positive and statistically significant impact on earnings. Specifically, the returns to having good A levels grades (at least one A level at grade A-C) stand at approximately **11%**. The combination of grade and subject area provides significant earning return especially to males: the earning premium is around **15%-20%** for men with at least one A level at grade A-C and STEM subjects, while the return is slightly lower (around **10%**) for men in possession of non-STEM A levels (3 or more in total). Women in possession of good A levels typically experience a boost in their earning premium of around **3%** (Table 10 and Table 11).

Maths Test scores age 10

- Again, **maths test scores at the age of 10** have a significant impact on earnings outcomes later in life. Compared to an individual in the lowest maths test score quartile, a female in the top quartile earns a **23.5%** premium (Table 23), while a male achieves an **11.2%** premium (Table 22).

Employment

- In terms of employment outcomes, the analysis indicates that overall, there are only weakly **significant employment effects** associated with the possession of A levels relative to GCSE/O levels. Although males in possession of 2 or more STEM A levels (with three or more A levels in total) have positive employment effects of around **2.8 percentage points**, the effects are only weakly significant (Table 13).
- Again, maths test scores at the age of 10 provide a significant employment boost to both men and women. Compared to the bottom quartile, a female in the top quartile achieves as a **6.6 percentage point** boost (Table 26), while a male in the third or top quartile achieves a **2.6 percentage point** boost (Table 25).

Table 9: Earnings returns associated with A levels in presence of additional qualifications (Summary - Men and women combined)

Control Variable	Basic Controls	Family and Child Background	Family and Child Background/ Age 10 Maths/ reading scores
2+ STEM A levels/ 3+ total A levels	0.166***	0.140***	0.123***
	(0.035)	(0.035)	(0.035)
2 STEM A levels/ 2 total A levels	0.069	0.049	0.031
	(0.055)	(0.053)	(0.053)
1 STEM A level/ 3+ total A levels	0.100**	0.072	0.057
	(0.044)	(0.044)	(0.044)
1 STEM A level/ 1-2 total A level	0.085**	0.075*	0.064
	(0.041)	(0.041)	(0.041)
No STEM A level/ 3+ total A levels	0.080**	0.054	0.047
	(0.036)	(0.036)	(0.036)
No STEM A level/ 1-2 total A levels	-0.049	-0.060*	-0.065**
	(0.030)	(0.031)	(0.031)
At least 1 A level at grade A-C	0.067**	0.069**	0.070**
	(0.028)	(0.028)	(0.028)
Observations	17,916	17,916	17,916
R-squared	0.490	0.496	0.500

Note: Reporting marginal effects. Standard errors clustered at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Source: London Economics' analysis of BCS70 data. Note that we undertook different model specifications - controlling for and excluding degree level classification. When we control for degree level classification, we found that average returns declined by approximately 1 percentage point compared to these results presented here.

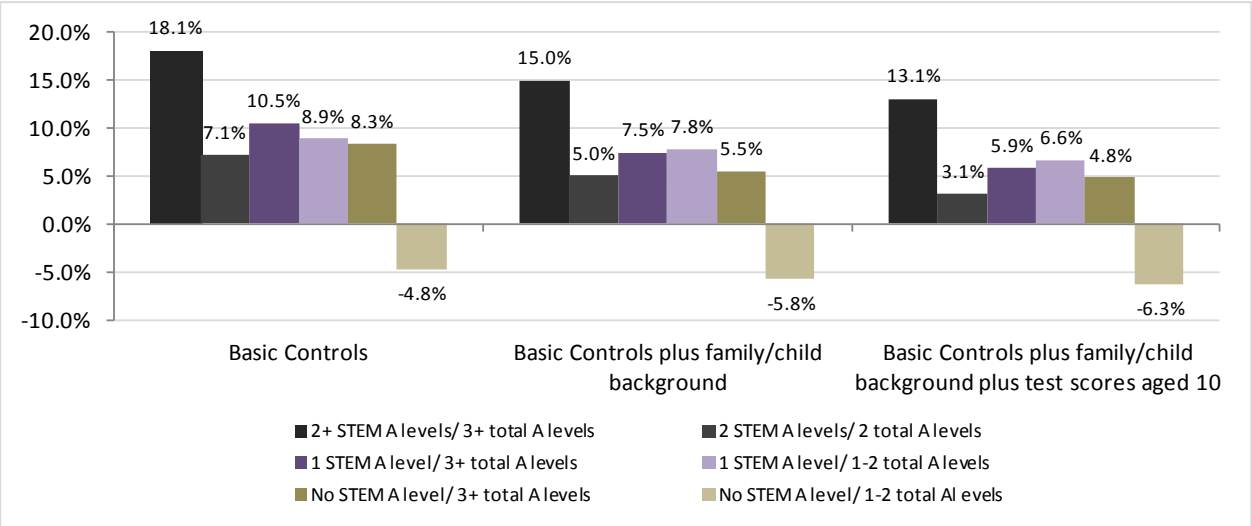
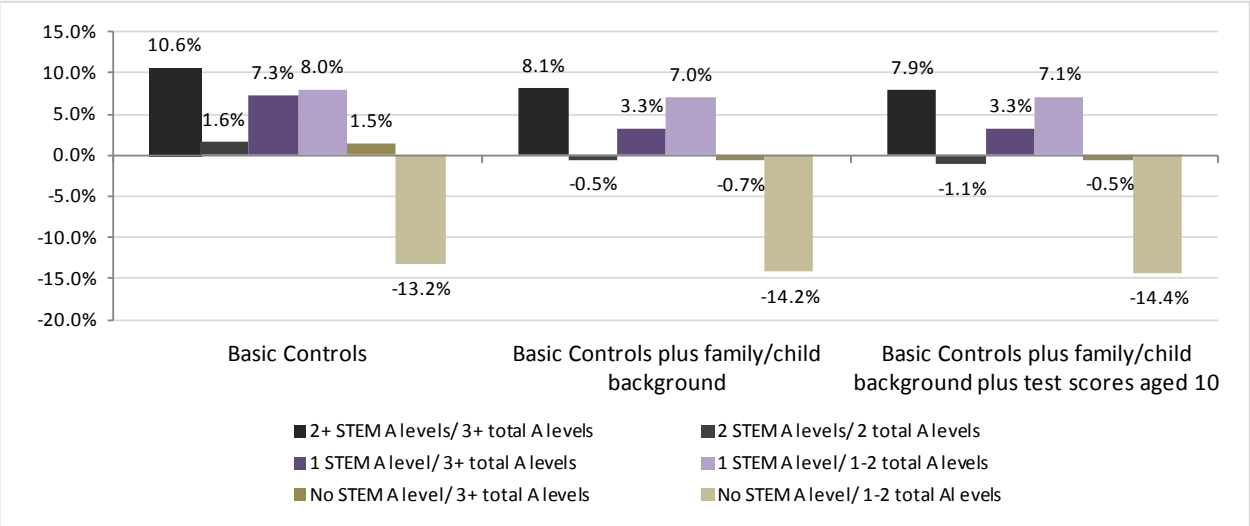


Table 10: Earnings returns associated with A levels in presence of additional qualifications (Summary results -Men)

Control Variable	Basic Controls	Family and Child Background	Family and Child Background/ Age 10 Maths/ reading scores
2+ STEM A levels/ 3+ total A levels	0.101**	0.078*	0.076
	(0.047)	(0.047)	(0.047)
2 STEM A levels/ 2 total A levels	0.016	-0.005	-0.011
	(0.068)	(0.065)	(0.064)
1 STEM A level/ 3+ total A levels	0.070	0.032	0.032
	(0.069)	(0.069)	(0.069)
1 STEM A level/ 1-2 total A level	0.077	0.068	0.069
	(0.051)	(0.052)	(0.052)
No STEM A level/ 3+ total A levels	0.015	-0.007	-0.005
	(0.052)	(0.052)	(0.051)
No STEM A level/ 1-2 total A levels	-0.142***	-0.153***	-0.155***
	(0.046)	(0.046)	(0.046)
At least 1 A level at grade A-C	0.105***	0.103***	0.101***
	(0.039)	(0.039)	(0.039)
Observations	8,740	8,740	8,740
R-squared	0.336	0.348	0.353

Note: Standard errors clustered at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Source: London Economics' analysis of BCS70 data. Note that we undertook different model specifications - controlling for and excluding degree level classification. When we control for degree level classification, we found that average returns declined by approximately 1 percentage point compared to these results presented here.



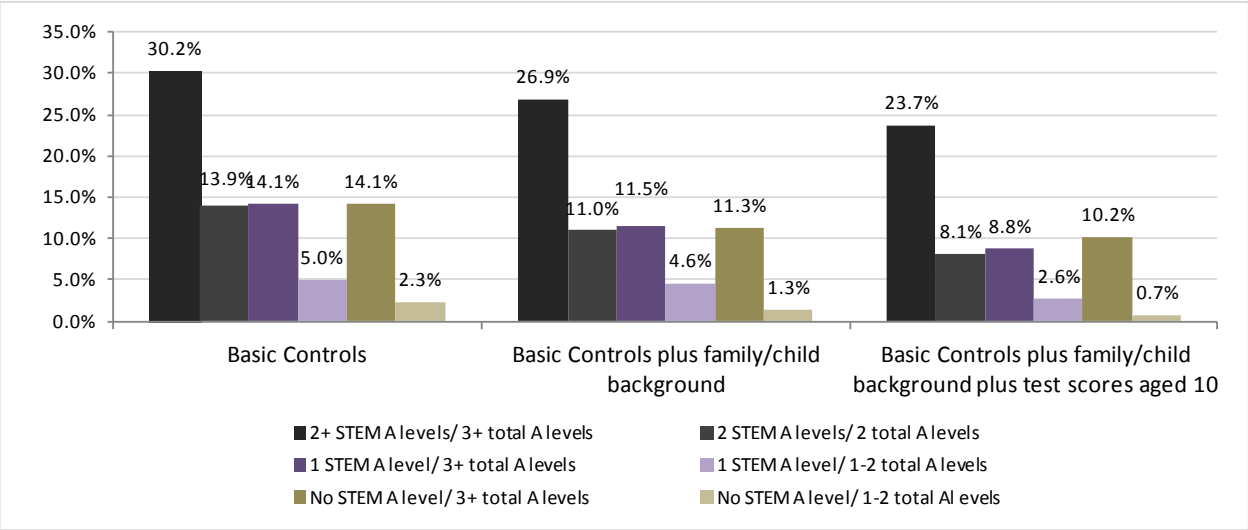
Source: London Economics' analysis of BCS70 data

Table 11: Earnings returns associated with A levels in presence of additional qualifications (Summary results -Women)

Control Variable	Basic Controls	Family and Child Background	Family and Child Background/ Age 10 Maths/ reading scores
2+ STEM A levels/ 3+ total A levels	0.264***	0.238***	0.213***
	(0.049)	(0.050)	(0.050)
2 STEM A levels/ 2 total A levels	0.130	0.104	0.078
	(0.089)	(0.088)	(0.089)
1 STEM A level/ 3+ total A levels	0.132**	0.109*	0.084
	(0.056)	(0.057)	(0.057)
1 STEM A level/ 1-2 total A level	0.049	0.045	0.026
	(0.064)	(0.064)	(0.065)
No STEM A level/ 3+ total A levels	0.132***	0.107**	0.097**
	(0.049)	(0.049)	(0.049)
No STEM A level/ 1-2 total A levels	0.023	0.013	0.007
	(0.038)	(0.039)	(0.039)
At least 1 A level at grade A-C	0.028	0.028	0.029
	(0.037)	(0.037)	(0.037)
Observations	9,176	9,176	9,176
R-squared	0.462	0.467	0.473

Note: Standard errors clustered at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Source: London Economics' analysis of BCS70 data. Note that we undertook different model specifications - controlling for and excluding degree level classification. When we control for degree level classification, we found that average returns declined by approximately 1 percentage point compared to these results presented here.



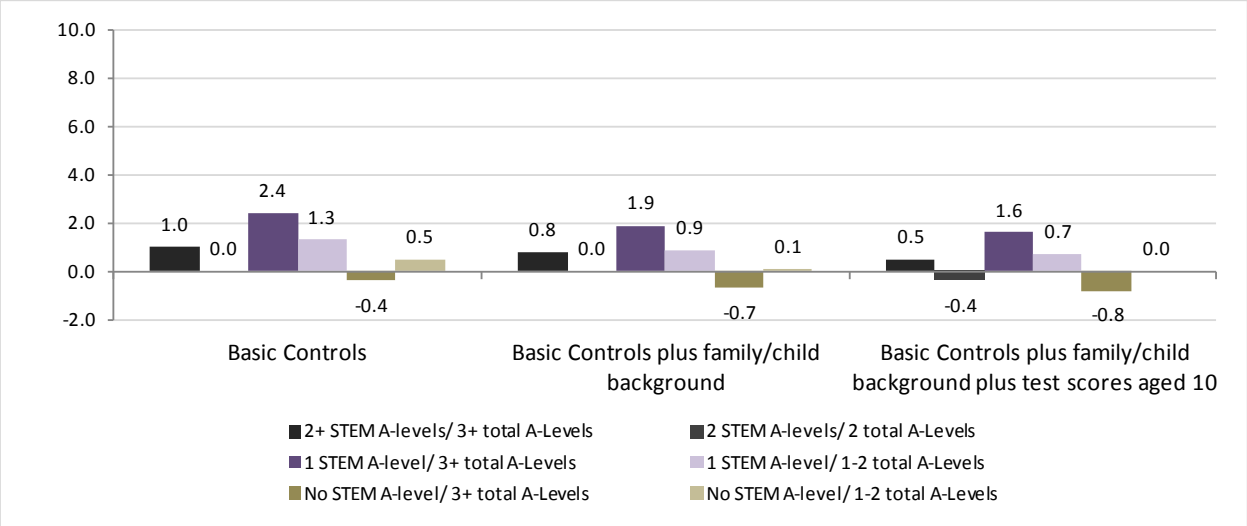
Source: London Economics' analysis of BCS70 data

Table 12: Employment returns associated with A levels in presence of additional qualifications (Summary results - Men and women combined)

Control Variable	Basic Controls	Family and Child Background	Family and Child Background/ Age 10 Maths/ reading scores
2+ STEM A levels/ 3+ total A levels	0.010	0.008	0.005
	(0.018)	(0.018)	(0.018)
2 STEM A levels/ 2 total A levels	0.000	-0.000	-0.004
	(0.027)	(0.026)	(0.026)
1 STEM A level/ 3+ total A levels	0.024	0.019	0.016
	(0.020)	(0.020)	(0.020)
1 STEM A level/ 1-2 total A level	0.013	0.009	0.007
	(0.019)	(0.019)	(0.019)
No STEM A level/ 3+ total A levels	-0.004	-0.007	-0.008
	(0.017)	(0.017)	(0.017)
No STEM A level/ 1-2 total A levels	0.005	0.001	-0.000
	(0.014)	(0.014)	(0.014)
At least 1 A level at grade A-C	-0.014	-0.012	-0.011
	(0.014)	(0.014)	(0.014)
Observations	26,302	26,302	26,302
Pseudo R-squared	0.0668	0.0724	0.0757

Note: Reporting marginal effects. Standard errors clustered at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Source: London Economics' analysis of BCS70 data. Note that we undertook different model specifications - controlling for and excluding degree level classification. When we control for degree level classification, we found that average returns declined by approximately 1 percentage point compared to these results presented here.



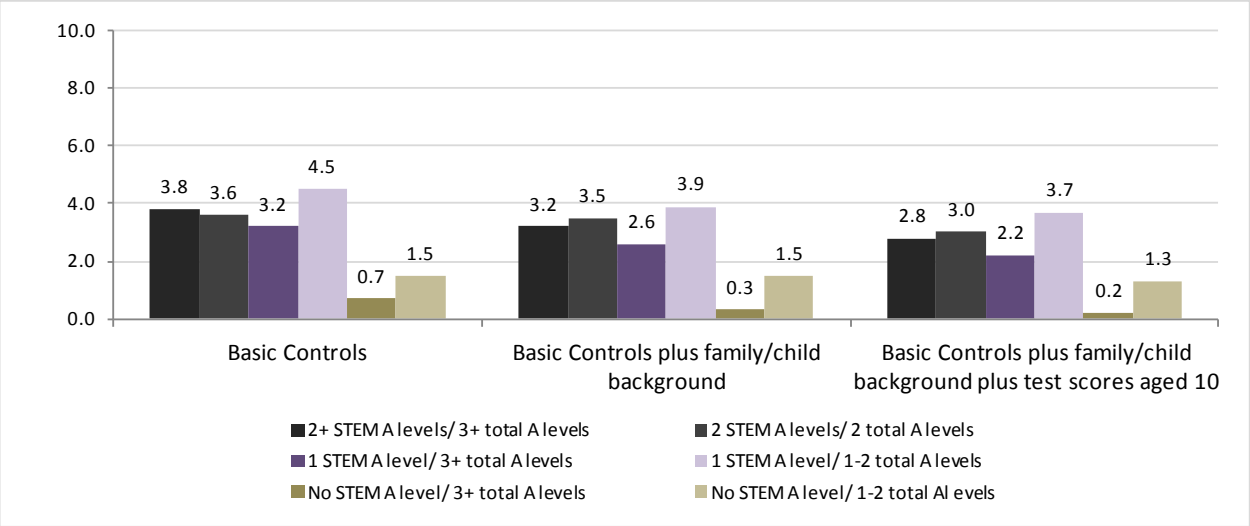
Source: London Economics' analysis of BCS70 data

Table 13: Employment returns associated with A levels in presence of additional qualifications (Summary results -Men)

Control Variable	Basic Controls	Family and Child Background	Family and Child Background/ Age 10 Maths/ reading scores
2+ STEM A levels/ 3+ total A levels	0.038**	0.032**	0.028*
	(0.017)	(0.016)	(0.017)
2 STEM A levels/ 2 total A levels	0.036	0.035	0.030
	(0.024)	(0.023)	(0.022)
1 STEM A level/ 3+ total A levels	0.032	0.026	0.022
	(0.020)	(0.019)	(0.019)
1 STEM A level/ 1-2 total A level	0.045**	0.039**	0.037*
	(0.021)	(0.020)	(0.019)
No STEM A level/ 3+ total A levels	0.007	0.003	0.002
	(0.017)	(0.017)	(0.017)
No STEM A level/ 1-2 total A levels	0.015	0.015	0.013
	(0.015)	(0.014)	(0.014)
At least 1 A level at grade A-C	-0.029*	-0.027	-0.026
	(0.017)	(0.017)	(0.016)
Observations	12,175	12,175	12,175
Pseudo R-squared	0.0615	0.0734	0.0801

Note: Reporting marginal effects. Standard errors clustered at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Source: London Economics' analysis of BCS70 data. Note that we undertook different model specifications - controlling for and excluding degree level classification. When we control for degree level classification, we found that average returns declined by approximately 1/2 a percentage point compared to these results presented here.



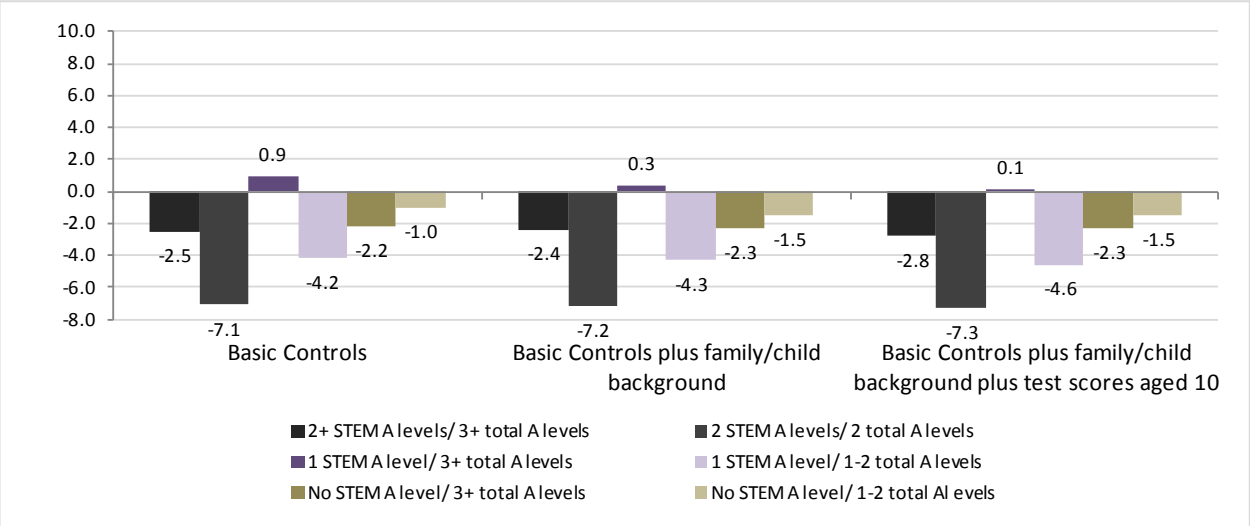
Source: London Economics' analysis of BCS70 data

Table 14: Employment returns associated with A levels in presence of additional qualifications (Summary results -Women)

Control Variable	Basic Controls	Family and Child Background	Family and Child Background/ Age 10 Maths/ reading scores
2+ STEM A levels/ 3+ total A levels	-0.025	-0.024	-0.028
	(0.031)	(0.031)	(0.032)
2 STEM A levels/ 2 total A levels	-0.071	-0.072	-0.073
	(0.054)	(0.053)	(0.054)
1 STEM A level/ 3+ total A levels	0.009	0.003	0.001
	(0.034)	(0.034)	(0.034)
1 STEM A level/ 1-2 total A level	-0.042	-0.043	-0.046
	(0.033)	(0.033)	(0.033)
No STEM A level/ 3+ total A levels	-0.022	-0.023	-0.023
	(0.029)	(0.029)	(0.029)
No STEM A level/ 1-2 total A levels	-0.010	-0.015	-0.015
	(0.024)	(0.024)	(0.024)
At least 1 A level at grade A-C	-0.004	-0.000	-0.000
	(0.023)	(0.023)	(0.023)
Observations	14,127	14,127	14,127
Pseudo R-squared	0.0239	0.0298	0.0326

Note: Reporting marginal effects. Standard errors clustered at the individual level in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Source: London Economics' analysis of BCS70 data. Note that we undertook different model specifications - controlling for and excluding degree level classification. When we control for degree level classification, we found that average returns declined by approximately 1/2 a percentage point compared to these results presented here.



Source: London Economics' analysis of BCS70 data

BACKGROUND MATERIAL

Index of Tables, Figures and Boxes

Tables

ANNEXES

Annex 1 Full econometric results

A1.1 Earnings – A levels as highest qualification

Table 15: Earnings returns associated with A levels (Men and Women combined)

Control Variable	Basic Controls	Family and Child Background	Family and Child Background/ Age 10 Maths/ reading scores
At least 2 STEM A levels	0.242***	0.206***	0.164**
	(0.063)	(0.065)	(0.066)
1 STEM A level	0.278***	0.226***	0.182**
	(0.081)	(0.081)	(0.082)
No STEM A levels	0.124*	0.083	0.052
	(0.067)	(0.066)	(0.066)
Less than 3 A levels	0.032	0.048	0.052
	(0.058)	(0.058)	(0.057)
At least 1 A level grade A-C	0.037	0.033	0.043
	(0.046)	(0.046)	(0.046)
Female	-0.320***	-0.315***	-0.317***
	(0.017)	(0.017)	(0.017)
Ethnicity(non white)	-0.132***	-0.104**	-0.073
	(0.048)	(0.047)	(0.049)
Married/cohabiting	0.125***	0.118***	0.114***
	(0.016)	(0.016)	(0.015)
Married/cohabiting - missing	0.014	0.041	0.062
	(0.069)	(0.070)	(0.073)
PT employment	-0.960***	-0.961***	-0.956***
	(0.022)	(0.022)	(0.021)
North West	0.088**	0.069**	0.076**
	(0.034)	(0.035)	(0.035)
Yorkshire and Humberside	0.123***	0.099***	0.105***
	(0.037)	(0.037)	(0.037)
East Midlands	0.076**	0.057	0.055
	(0.039)	(0.038)	(0.039)
West Midlands	0.149***	0.126***	0.136***
	(0.039)	(0.039)	(0.039)
East of England	0.197***	0.174***	0.173***
	(0.037)	(0.037)	(0.037)
London	0.415***	0.376***	0.386***
	(0.041)	(0.040)	(0.041)
South East	0.196***	0.157***	0.161***
	(0.035)	(0.036)	(0.036)
South West	0.079**	0.042	0.054
	(0.037)	(0.038)	(0.038)
Wales	0.095**	0.074	0.078*
	(0.045)	(0.045)	(0.046)
Scotland	0.105***	0.128***	0.134***
	(0.038)	(0.038)	(0.038)
Low birth-weight (less than 2.5kg)		-0.008	0.005

		(0.036)	(0.035)
Low birth-weight - missing		-0.017	-0.007
		(0.184)	(0.186)
Family owned house at age 10		0.078***	0.068***
		(0.019)	(0.019)
House owned - missing		0.087*	0.080
		(0.051)	(0.053)
Parental occupation at age 10: Skilled manual or non-manual		0.069***	0.064***
		(0.024)	(0.024)
Parental occupation at age 10: Managerial/technical or professional		0.101***	0.093***
		(0.029)	(0.029)
Parental occupation at age 10:Missing		0.001	-0.001
		(0.052)	(0.053)
Father left school at 15		0.045	0.051
		(0.038)	(0.038)
Father left school at 16		0.086**	0.079*
		(0.041)	(0.041)
Father left school at 17-18		0.104**	0.095**
		(0.045)	(0.045)
Father left school after 18		0.058	0.058
		(0.054)	(0.054)
Father left school - Missing		-0.039	-0.027
		(0.054)	(0.054)
Mother left school at 15		-0.025	-0.031
		(0.040)	(0.040)
Mother left school at 16		0.000	-0.014
		(0.043)	(0.043)
Mother left school at 17-18		0.008	-0.006
		(0.047)	(0.047)
Mother left school after 18		0.129**	0.113*
		(0.063)	(0.063)
Mother left school - Missing		-0.059	-0.056
		(0.136)	(0.134)
Age of mother at birth:20-24		-0.077**	-0.079**
		(0.031)	(0.031)
Age of mother at birth:25-29		-0.039	-0.041
		(0.032)	(0.032)
Age of mother at birth:30-39		-0.063*	-0.072**
		(0.035)	(0.035)
Age of mother at birth:40 plus		-0.034	-0.044
		(0.087)	(0.087)
Age of mother at birth: Missing		0.137	0.115
		(0.160)	(0.163)
Reading test score at age 10 - 2nd quartile			0.032
			(0.027)
Reading test score at age 10 - 3rd quartile			0.035
			(0.029)
Reading test score at age 10 - 4th quartile			0.053
			(0.034)
Reading test score at age 10 - missing			0.104
			(0.125)
Maths test score at age 10 - 2nd quartile			0.125***
			(0.026)
Maths test score at age 10 - 3rd quartile			0.130***

			(0.029)
Maths test score at age 10 - 4th quartile			0.166***
			(0.032)
Maths test score at age 10 - missing			0.020
			(0.127)
Constant	5.525***	5.445***	5.327***
	(0.057)	(0.078)	(0.081)
Observations	8,489	8,489	8,489
R-squared	0.487	0.498	0.504

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Source: London Economics' analysis of BCS70 data

Table 16: Earnings returns associated with A levels (Men)

Control Variable	Basic Controls	Family and Child Background	Family and Child Background/ Maths and Reading scores at age 10
At least 2 STEM A levels	0.123	0.097	0.075
	(0.087)	(0.083)	(0.083)
1 STEM A level	0.195*	0.145	0.129
	(0.111)	(0.108)	(0.110)
No STEM A levels	-0.001	-0.030	-0.041
	(0.097)	(0.093)	(0.091)
Less than 3 A levels	0.107	0.108	0.102
	(0.082)	(0.080)	(0.080)
At least 1 A level grade A-C	0.112	0.107	0.113*
	(0.069)	(0.065)	(0.065)
Ethnicity(non white)	-0.096	-0.077	-0.034
	(0.065)	(0.063)	(0.065)
Married/cohabiting	0.199***	0.191***	0.182***
	(0.022)	(0.022)	(0.022)
Married/cohabiting - missing	0.036	0.064	0.077
	(0.069)	(0.072)	(0.065)
PT employment	-1.152***	-1.173***	-1.152***
	(0.089)	(0.089)	(0.092)
North West	0.099**	0.080*	0.096**
	(0.046)	(0.047)	(0.047)
Yorkshire and Humberside	0.094*	0.080	0.102*
	(0.052)	(0.053)	(0.053)
East Midlands	0.135***	0.121**	0.131**
	(0.051)	(0.051)	(0.052)
West Midlands	0.147***	0.130**	0.149***
	(0.052)	(0.052)	(0.052)
East of England	0.250***	0.227***	0.240***
	(0.048)	(0.048)	(0.049)
London	0.430***	0.379***	0.404***
	(0.056)	(0.055)	(0.056)
South East	0.247***	0.204***	0.224***
	(0.047)	(0.048)	(0.049)
South West	0.130***	0.095*	0.126**
	(0.050)	(0.051)	(0.052)
Wales	0.138**	0.135**	0.145**
	(0.056)	(0.057)	(0.058)
Scotland	0.120**	0.146***	0.160***
	(0.050)	(0.050)	(0.051)
Low birth-weight (less than 2.5kg)		-0.006	0.022
		(0.043)	(0.041)
Low birth-weight - missing		-0.212	-0.136
		(0.228)	(0.225)
Family owned house at age 10		0.090***	0.078***
		(0.026)	(0.026)
House owned - missing		0.222***	0.230***
		(0.071)	(0.075)
Parental occupation at age 10:Skilled manual or non-manual		0.090***	0.085**
		(0.033)	(0.033)
Parental occupation at age 10:		0.112***	0.110***

Managerial/technical or professional			
		(0.040)	(0.040)
Parental occupation at age 10:Missing		-0.103	-0.100
		(0.072)	(0.075)
Father left school at 15		0.090*	0.095**
		(0.047)	(0.047)
Father left school at 16		0.146***	0.136**
		(0.054)	(0.053)
Father left school at 17-18		0.172***	0.164***
		(0.058)	(0.058)
Father left school after 18		0.109	0.109
		(0.074)	(0.073)
Father left school - Missing		0.055	0.045
		(0.074)	(0.074)
Mother left school at 15		-0.046	-0.051
		(0.054)	(0.054)
Mother left school at 16		-0.038	-0.047
		(0.060)	(0.060)
Mother left school at 17-18		-0.023	-0.028
		(0.063)	(0.063)
Mother left school after 18		0.109	0.090
		(0.084)	(0.084)
Mother left school - Missing		0.010	0.003
		(0.216)	(0.209)
Age of mother at birth:20-24		-0.143***	-0.145***
		(0.044)	(0.044)
Age of mother at birth:25-29		-0.116***	-0.121***
		(0.045)	(0.045)
Age of mother at birth:30-39		-0.142***	-0.147***
		(0.048)	(0.048)
Age of mother at birth:40 plus		-0.011	-0.016
		(0.095)	(0.093)
Age of mother at birth: Missing		0.079	0.066
		(0.142)	(0.146)
Reading test score at age 10 - 2nd quartile			0.051
			(0.037)
Reading test score at age 10 - 3rd quartile			0.042
			(0.041)
Reading test score at age 10 - 4th quartile			0.024
			(0.049)
Reading test score at age 10 - missing			0.268**
			(0.115)
Maths test score at age 10 - 2nd quartile			0.098***
			(0.037)
Maths test score at age 10 - 3rd quartile			0.130***
			(0.043)
Maths test score at age 10 - 4th quartile			0.118**
			(0.046)
Maths test score at age 10 - missing			-0.220*
			(0.115)
Constant	5.361***	5.296***	5.191***
	(0.075)	(0.104)	(0.107)
Observations	4,134	4,134	4,134
R-squared	0.273	0.298	0.306

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Source: London Economics' analysis of BCS70 data

Table 17: Earnings returns associated with A levels (Women)

Control Variable	Basic Controls	Family and Child Background	Family and Child Background/ Maths and Reading scores at age 10
At least 2 STEM A levels	0.384***	0.337***	0.286***
	(0.091)	(0.098)	(0.098)
1 STEM A level	0.348***	0.306***	0.258**
	(0.117)	(0.118)	(0.116)
No STEM A levels	0.267***	0.228***	0.198**
	(0.084)	(0.086)	(0.084)
Less than 3 A levels	-0.066	-0.047	-0.033
	(0.077)	(0.076)	(0.074)
At least 1 A level grade A-C	-0.032	-0.037	-0.043
	(0.058)	(0.061)	(0.061)
Ethnicity(non white)	-0.155**	-0.104	-0.080
	(0.069)	(0.068)	(0.070)
Married/cohabiting	0.042*	0.037*	0.035
	(0.022)	(0.022)	(0.022)
Married/cohabiting - missing	0.043	0.048	0.069
	(0.155)	(0.152)	(0.175)
PT employment	-0.929***	-0.929***	-0.921***
	(0.023)	(0.022)	(0.022)
North West	0.078	0.060	0.063
	(0.051)	(0.051)	(0.053)
Yorkshire and Humberside	0.142***	0.117**	0.111**
	(0.053)	(0.053)	(0.055)
East Midlands	0.017	-0.006	-0.015
	(0.058)	(0.058)	(0.058)
West Midlands	0.141**	0.121**	0.125**
	(0.058)	(0.058)	(0.058)
East of England	0.137**	0.117**	0.095
	(0.058)	(0.058)	(0.059)
London	0.405***	0.371***	0.360***
	(0.060)	(0.059)	(0.060)
South East	0.150***	0.113**	0.108**
	(0.053)	(0.053)	(0.054)
South West	0.034	-0.005	-0.007
	(0.055)	(0.056)	(0.057)
Wales	0.061	0.032	0.026
	(0.069)	(0.069)	(0.071)
Scotland	0.092	0.105*	0.097*
	(0.058)	(0.059)	(0.059)
Low birth-weight (less than 2.5kg)		-0.004	-0.012
		(0.056)	(0.055)
Low birth-weight - missing		0.023	0.013
		(0.447)	(0.443)
Family owned house at age 10		0.070**	0.062**
		(0.028)	(0.027)
House owned - missing		-0.018	-0.031
		(0.071)	(0.070)

Parental occ. age 10: Skilled manual/non-manual		0.049	0.046
		(0.034)	(0.034)
Parental occ. age 10: Managerial/technical/prof		0.089**	0.080*
		(0.041)	(0.041)
Parental occupation at age 10:Missing		0.061	0.051
		(0.071)	(0.070)
Father left school at 15		0.015	0.016
		(0.058)	(0.057)
Father left school at 16		0.054	0.044
		(0.062)	(0.061)
Father left school at 17-18		0.057	0.038
		(0.068)	(0.068)
Father left school after 18		-0.000	-0.001
		(0.076)	(0.075)
Father left school – Missing		-0.115	-0.103
		(0.077)	(0.077)
Mother left school at 15		-0.003	-0.009
		(0.057)	(0.057)
Mother left school at 16		0.028	0.013
		(0.060)	(0.060)
Mother left school at 17-18		0.037	0.017
		(0.068)	(0.068)
Mother left school after 18		0.148	0.136
		(0.093)	(0.091)
Mother left school – Missing		-0.100	-0.072
		(0.156)	(0.163)
Age of mother at birth:20-24		-0.020	-0.023
		(0.043)	(0.042)
Age of mother at birth:25-29		0.028	0.024
		(0.045)	(0.044)
Age of mother at birth:30-39		0.005	-0.012
		(0.051)	(0.050)
Age of mother at birth:40 plus		-0.044	-0.062
		(0.146)	(0.147)
Age of mother at birth: Missing		0.313	0.235
		(0.472)	(0.472)
Reading test score at age 10 - 2nd quartile			0.017
			(0.038)
Reading test score at age 10 - 3rd quartile			0.030
			(0.039)
Reading test score at age 10 - 4th quartile			0.080*
			(0.047)
Reading test score at age 10 - missing			-0.170
			(0.179)
Maths test score at age 10 - 2nd quartile			0.145***
			(0.036)
Maths test score at age 10 - 3rd quartile			0.118***
			(0.039)
Maths test score at age 10 - 4th quartile			0.214***
			(0.047)
Maths test score at age 10 - missing			0.358**
			(0.181)
Constant	5.364***	5.259***	5.135***
	(0.088)	(0.115)	(0.119)

Observations	4,344	4,344	4,344
R-squared	0.420	0.431	0.440

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Source: London Economics' analysis of BCS70 data

A1.2 Employment– A levels as highest qualification

Table 18: Employment returns associated with A levels (Men and Women combined)

Control Variable	Basic Controls	Family and Child Background	Family and Child Background/ Maths and Reading scores at age 10
At least 2 STEM A levels	0.059	0.056	0.038
	(0.038)	(0.038)	(0.038)
1 STEM A level	0.011	0.002	-0.014
	(0.035)	(0.036)	(0.036)
No STEM A levels	0.065*	0.058	0.047
	(0.035)	(0.036)	(0.035)
Less than 3 A levels	-0.007	-0.007	-0.004
	(0.028)	(0.028)	(0.027)
At least 1 A level grade A-C	-0.045	-0.041	-0.038
	(0.030)	(0.030)	(0.029)
Female	-0.165***	-0.164***	-0.163***
	(0.008)	(0.008)	(0.008)
Ethnicity(non white)	-0.038	-0.036	-0.027
	(0.028)	(0.029)	(0.027)
Married/cohabiting	0.040***	0.037***	0.033***
	(0.009)	(0.009)	(0.009)
Married/cohabiting - missing	0.027	0.034	0.036
	(0.069)	(0.064)	(0.063)
North West	0.020	0.009	0.010
	(0.022)	(0.021)	(0.021)
Yorkshire and Humberside	0.028	0.019	0.021
	(0.023)	(0.022)	(0.022)
East Midlands	0.047**	0.036	0.034
	(0.023)	(0.022)	(0.022)
West Midlands	0.027	0.018	0.020
	(0.023)	(0.022)	(0.022)
East of England	-0.004	-0.015	-0.015
	(0.023)	(0.022)	(0.022)
London	-0.004	-0.013	-0.009
	(0.025)	(0.024)	(0.024)
South East	0.013	0.000	0.002
	(0.022)	(0.021)	(0.021)
South West	0.012	0.000	0.004
	(0.023)	(0.022)	(0.022)
Wales	-0.004	-0.013	-0.011
	(0.026)	(0.025)	(0.025)
Scotland	0.001	0.002	0.003
	(0.025)	(0.024)	(0.024)
Low birth-weight (less than 2.5kg)		-0.038*	-0.031
		(0.022)	(0.020)
Low birth-weight - missing		-0.150	-0.176
		(0.142)	(0.159)

Family owned house at age 10		0.035***	0.031***
		(0.011)	(0.010)
House owned - missing		0.045*	0.050**
		(0.026)	(0.025)
Parental occ. age 10: Skilled manual/non-manual		-0.009	-0.011
		(0.012)	(0.011)
Parental occ. age 10: managerial/technical/prof		-0.021	-0.025*
		(0.014)	(0.014)
Parental occupation at age 10:Missing		-0.055*	-0.055*
		(0.031)	(0.030)
Father left school at 15		0.012	0.013
		(0.020)	(0.020)
Father left school at 15		0.037*	0.034
		(0.022)	(0.022)
Father left school at 16		0.023	0.020
		(0.023)	(0.023)
Father left school at 17-18		0.028	0.026
		(0.026)	(0.026)
Father left school after 18		0.005	0.011
		(0.032)	(0.031)
Father left school - Missing		0.007	-0.001
		(0.020)	(0.019)
Mother left school at 15		-0.007	-0.017
		(0.022)	(0.021)
Mother left school at 16		0.020	0.010
		(0.023)	(0.022)
Mother left school at 17-18		-0.022	-0.028
		(0.033)	(0.032)
Mother left school after 18		-0.031	-0.035
		(0.073)	(0.074)
Mother left school - Missing		0.030*	0.028
		(0.018)	(0.018)
Age of mother at birth:25-29		0.032*	0.029
		(0.018)	(0.018)
Age of mother at birth:30-39		0.036*	0.030
		(0.019)	(0.019)
Age of mother at birth:40 plus		0.012	-0.002
		(0.042)	(0.043)
Age of mother at birth: Missing		0.139***	0.145***
		(0.047)	(0.043)
Reading test score at age 10 - 2nd quartile			0.033**
			(0.014)
Reading test score at age 10 - 3rd quartile			0.027*
			(0.015)
Reading test score at age 10 - 4th quartile			0.013
			(0.018)
Reading test score at age 10 - missing			-0.053
			(0.051)
Maths test score at age 10 - 2nd quartile			0.044***
			(0.016)
Maths test score at age 10 - 3rd quartile			0.047***
			(0.017)
Maths test score at age 10 - 4th quartile			0.075***
			(0.019)

Maths test score at age 10 - missing			0.080*
			(0.041)
Pseudo R-squared	0.073	0.080	0.087
Observations	12,975	12,975	12,975

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Source: London Economics' analysis of BCS70 data

Table 19: Employment returns associated with A levels (Men)

Control Variable	Basic Controls	Family and Child Background	Family and Child Background/ Maths and Reading scores at age 10
At least 2 STEM A levels	0.041	0.026	0.009
	(0.038)	(0.036)	(0.036)
1 STEM A level	0.040	0.021	0.012
	(0.034)	(0.032)	(0.032)
No STEM A levels	0.040	0.025	0.020
	(0.032)	(0.031)	(0.030)
Less than 3 A levels	-0.020	-0.013	-0.015
	(0.028)	(0.026)	(0.026)
At least 1 A level grade A-C	-0.047	-0.033	-0.026
	(0.036)	(0.031)	(0.029)
Ethnicity(non white)	-0.004	-0.005	0.002
	(0.021)	(0.022)	(0.020)
Married/cohabiting	0.074***	0.073***	0.069***
	(0.011)	(0.011)	(0.011)
Married/cohabiting - missing	0.004	0.015	0.015
	(0.063)	(0.054)	(0.054)
North West	0.025	0.011	0.012
	(0.024)	(0.020)	(0.020)
Yorkshire and Humberside	0.043*	0.029	0.032
	(0.024)	(0.020)	(0.021)
East Midlands	0.061***	0.044**	0.045**
	(0.023)	(0.019)	(0.019)
West Midlands	0.027	0.018	0.022
	(0.026)	(0.022)	(0.021)
East of England	0.038	0.023	0.026
	(0.024)	(0.020)	(0.020)
London	0.016	0.001	0.007
	(0.026)	(0.023)	(0.023)
South East	0.027	0.008	0.012
	(0.024)	(0.022)	(0.022)
South West	0.021	0.009	0.013
	(0.027)	(0.023)	(0.023)
Wales	0.014	-0.000	0.003
	(0.029)	(0.025)	(0.025)
Scotland	0.007	0.002	0.003
	(0.027)	(0.023)	(0.023)
Low birthweight (less than 2.5kg)		-0.023	-0.019
		(0.020)	(0.018)
Low birthweight - missing		-0.029	-0.011
		(0.077)	(0.067)
Family owned house at age 10		0.027***	0.023**
		(0.010)	(0.010)

House owned - missing		0.031	0.030
		(0.022)	(0.020)
Parental occupation at age 10:Skilled manual or non-manual		-0.014	-0.014
		(0.009)	(0.009)
Parental occupation at age 10:Managerial/technical or professional		-0.021*	-0.022*
		(0.012)	(0.012)
Parental occupation at age 10:Missing		-0.046	-0.045*
		(0.029)	(0.027)
Father left school at 15		0.001	0.005
		(0.020)	(0.021)
Father left school at 15		0.027	0.026
		(0.022)	(0.022)
Father left school at 16		0.011	0.015
		(0.023)	(0.024)
Father left school at 17-18		0.024	0.024
		(0.025)	(0.025)
Father left school after 18		0.031	0.034
		(0.025)	(0.025)
Father left school - Missing		0.010	0.002
		(0.022)	(0.020)
Mother left school at 15		0.016	0.006
		(0.024)	(0.022)
Mother left school at 16		0.022	0.013
		(0.023)	(0.021)
Mother left school at 17-18		-0.023	-0.036
		(0.036)	(0.035)
Mother left school after 18		-0.007	-0.015
		(0.069)	(0.070)
Mother left school - Missing		0.032*	0.030*
		(0.018)	(0.018)
Age of mother at birth:25-29		0.036*	0.033*
		(0.019)	(0.018)
Age of mother at birth:30-39		0.040**	0.037**
		(0.019)	(0.018)
Age of mother at birth:40 plus		0.016	0.004
		(0.043)	(0.047)
Age of mother at birth:Missing		0.048	0.040
		(0.037)	(0.039)
Reading test score at age 10 - 2nd quartile			0.013
			(0.011)
Reading test score at age 10 - 3rd quartile			0.006
			(0.013)
Reading test score at age 10 - 4th quartile			-0.001
			(0.016)
Reading test score at age 10 - missing			-0.046
			(0.057)
Maths test score at age 10 - 2nd quartile			0.002
			(0.019)
Maths test score at age 10 - 3rd quartile			0.034*
			(0.019)
Maths test score at age 10 - 4th quartile			0.049**
			(0.020)

Maths test score at age 10 - missing			0.051
			(0.038)
Pseudo R-squared	0.057	0.076	0.087
Observations	5,980	5,980	5,980

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Source: London Economics' analysis of BCS70 data

Table 20: Employment returns associated with A levels (Women)

Control Variable	Basic Controls	Family and Child Background	Family and Child Background/ Maths and Reading scores at age 10
At least 2 STEM A levels	0.098	0.104	0.085
	(0.065)	(0.063)	(0.064)
1 STEM A level	-0.026	-0.025	-0.047
	(0.061)	(0.061)	(0.061)
No STEM A levels	0.092	0.090	0.074
	(0.061)	(0.062)	(0.062)
Less than 3 A levels	-0.003	-0.010	0.000
	(0.047)	(0.048)	(0.047)
At least 1 A level grade A-C	-0.045	-0.044	-0.045
	(0.047)	(0.047)	(0.047)
Ethnicity(non white)	-0.065	-0.052	-0.044
	(0.049)	(0.051)	(0.050)
Married/cohabiting	-0.002	-0.006	-0.009
	(0.014)	(0.014)	(0.014)
Married/cohabiting - missing	0.124	0.127	0.129
	(0.107)	(0.100)	(0.097)
North West	0.013	0.002	0.001
	(0.036)	(0.035)	(0.034)
Yorkshire and Humberside	0.015	0.004	0.005
	(0.037)	(0.037)	(0.036)
East Midlands	0.027	0.013	0.009
	(0.039)	(0.038)	(0.038)
West Midlands	0.022	0.012	0.010
	(0.037)	(0.036)	(0.035)
East of England	-0.055	-0.067*	-0.070*
	(0.038)	(0.038)	(0.037)
London	-0.028	-0.038	-0.034
	(0.041)	(0.041)	(0.040)
South East	-0.004	-0.019	-0.018
	(0.035)	(0.034)	(0.034)
South West	-0.005	-0.022	-0.018
	(0.036)	(0.036)	(0.035)
Wales	-0.021	-0.033	-0.029
	(0.042)	(0.041)	(0.040)
Scotland	-0.004	-0.001	0.003
	(0.041)	(0.040)	(0.039)
Low birth-weight (less than 2.5kg)		-0.039	-0.031
		(0.035)	(0.034)
Low birth-weight - missing		-0.322	-0.364
		(0.221)	(0.227)
Family owned house at age 10		0.042**	0.038**

		(0.017)	(0.017)
House owned - missing		0.055	0.070
		(0.045)	(0.044)
Parental occupation at age 10:Skilled manual or non-manual		-0.006	-0.006
		(0.021)	(0.020)
Parental occupation at age 10:Managerial/technical or professional		-0.021	-0.026
		(0.025)	(0.025)
Parental occupation at age 10:Missing		-0.061	-0.063
		(0.049)	(0.050)
Father left school at 15		0.016	0.015
		(0.033)	(0.033)
Father left school at 15		0.041	0.039
		(0.035)	(0.035)
Father left school at 16		0.028	0.022
		(0.038)	(0.038)
Father left school at 17-18		0.016	0.013
		(0.045)	(0.045)
Father left school after 18		-0.037	-0.024
		(0.058)	(0.056)
Father left school - Missing		0.012	-0.002
		(0.033)	(0.032)
Mother left school at 15		-0.022	-0.036
		(0.036)	(0.034)
Mother left school at 16		0.031	0.015
		(0.038)	(0.037)
Mother left school at 17-18		-0.008	-0.017
		(0.052)	(0.050)
Mother left school after 18		-0.053	-0.061
		(0.125)	(0.126)
Mother left school - Missing		0.014	0.013
		(0.028)	(0.028)
Age of mother at birth:25-29		0.018	0.017
		(0.029)	(0.029)
Age of mother at birth:30-39		0.018	0.013
		(0.031)	(0.031)
Age of mother at birth:40 plus		-0.002	-0.017
		(0.063)	(0.064)
Age of mother at birth:Missing		0.237***	0.246***
		(0.063)	(0.055)
Reading test score at age 10 - 2nd quartile			0.048**
			(0.023)
Reading test score at age 10 - 3rd quartile			0.042
			(0.025)
Reading test score at age 10 - 4th quartile			0.024
			(0.030)
Reading test score at age 10 - missing			-0.094
			(0.086)
Maths test score at age 10 - 2nd quartile			0.076***
			(0.024)
Maths test score at age 10 - 3rd quartile			0.055**
			(0.027)
Maths test score at age 10 - 4th quartile			0.092***

			(0.031)
Maths test score at age 10 - missing			0.128*
			(0.070)
Pseudo R-squared	0.014	0.021	0.028
Observations	6,995	6,995	6,995

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Source: London Economics' analysis of BCS70 data

A1.3 Earnings – A levels combined with further attainment

Table 21: Earnings returns associated with A levels in the presence of additional attainment (Men and Women combined)

Control Variable	Basic Controls	Family and Child Background	Family and Child Background/ Maths and Reading scores at age 10
2+ STEM A levels	0.166***	0.140***	0.123***
	(0.035)	(0.035)	(0.035)
2+ STEM A levels	0.069	0.049	0.031
	(0.055)	(0.053)	(0.053)
1 STEM A level	0.100**	0.072	0.057
	(0.044)	(0.044)	(0.044)
1 STEM A level	0.085**	0.075*	0.064
	(0.041)	(0.041)	(0.041)
No STEM A levels	0.080**	0.054	0.047
	(0.036)	(0.036)	(0.036)
No STEM A levels	-0.049	-0.060*	-0.065**
	(0.030)	(0.031)	(0.031)
At least 1 A level grade A-C	0.067**	0.069**	0.070**
	(0.028)	(0.028)	(0.028)
Highest qualification: AS levels or 1 A level	0.184***	0.171***	0.155***
	(0.037)	(0.037)	(0.037)
Highest qualification: 2+ A levels, Scot higher/6th	0.130***	0.117***	0.102***
	(0.027)	(0.027)	(0.027)
Highest qualification: Diploma	0.143***	0.134***	0.133***
	(0.018)	(0.018)	(0.018)
Highest qualification: Degree, PGCE, Other Degree level	0.324***	0.295***	0.280***
	(0.016)	(0.016)	(0.016)
Highest qualification: Higher Degree	0.360***	0.326***	0.310***
	(0.026)	(0.026)	(0.026)
Female	-0.281***	-0.279***	-0.278***
	(0.012)	(0.012)	(0.012)
Ethnicity(non white)	-0.117***	-0.095***	-0.069**
	(0.030)	(0.031)	(0.032)
Married/cohabiting	0.122***	0.116***	0.112***
	(0.011)	(0.011)	(0.011)
Married/cohabiting - missing	0.149*	0.162*	0.179**
	(0.084)	(0.086)	(0.085)
PT employment	-0.926***	-0.928***	-0.925***

	(0.016)	(0.016)	(0.016)
North West	0.087***	0.076***	0.078***
	(0.029)	(0.029)	(0.029)
Yorkshire and Humberside	0.103***	0.090***	0.093***
	(0.030)	(0.030)	(0.030)
East Midlands	0.068**	0.052	0.050
	(0.032)	(0.032)	(0.032)
West Midlands	0.104***	0.090***	0.097***
	(0.030)	(0.030)	(0.030)
East of England	0.195***	0.176***	0.173***
	(0.030)	(0.030)	(0.030)
London	0.397***	0.369***	0.375***
	(0.030)	(0.030)	(0.030)
South East	0.183***	0.157***	0.159***
	(0.028)	(0.028)	(0.029)
South West	0.041	0.016	0.021
	(0.031)	(0.031)	(0.031)
Wales	0.032	0.020	0.023
	(0.035)	(0.035)	(0.036)
Scotland	0.103***	0.108***	0.105***
	(0.031)	(0.031)	(0.031)
Northern Ireland	-0.816***	-0.831***	-0.841***
	(0.037)	(0.043)	(0.044)
Low birth-weight (less than 2.5kg)		-0.051*	-0.038
		(0.027)	(0.027)
Low birth-weight - missing		-0.063	-0.067
		(0.138)	(0.137)
Family owned house at age 10		0.057***	0.050***
		(0.015)	(0.014)
House owned - missing		0.077*	0.059
		(0.040)	(0.040)
Parental occupation at age 10: Skilled manual or non-manual		0.049***	0.042**
		(0.019)	(0.019)
Parental occupation at age 10: Managerial/technical or professional		0.090***	0.081***
		(0.021)	(0.021)
Parental occupation at age 10:Missing		0.014	0.017
		(0.041)	(0.040)
Father left school at 15		0.026	0.030
		(0.029)	(0.029)
Father left school at 16		0.082***	0.075**
		(0.031)	(0.031)
Father left school at 17-18		0.068**	0.062*
		(0.033)	(0.032)
Father left school after 18		0.042	0.039
		(0.035)	(0.035)
Father left school - Missing		0.011	0.013
		(0.040)	(0.040)
Mother left school at 15		0.010	0.005
		(0.031)	(0.031)
Mother left school at 16		0.016	0.005
		(0.032)	(0.032)
Mother left school at 17-18		0.027	0.015
		(0.033)	(0.034)

Mother left school after 18		0.087**	0.075*
		(0.039)	(0.040)
Mother left school - Missing		0.047	0.047
		(0.095)	(0.094)
Age of mother at birth:20-24		-0.035	-0.038
		(0.024)	(0.024)
Age of mother at birth:25-29		-0.013	-0.016
		(0.024)	(0.024)
Age of mother at birth:30-39		-0.023	-0.029
		(0.026)	(0.026)
Age of mother at birth:40 plus		0.006	0.001
		(0.055)	(0.055)
Age of mother at birth: Missing		0.058	0.041
		(0.127)	(0.126)
Reading test score at age 10 - 2nd quartile			0.021
			(0.021)
Reading test score at age 10 - 3rd quartile			0.040*
			(0.022)
Reading test score at age 10 - 4th quartile			0.024
			(0.025)
Reading test score at age 10 - missing			0.101
			(0.091)
Maths test score at age 10 - 2nd quartile			0.130***
			(0.021)
Maths test score at age 10 - 3rd quartile			0.149***
			(0.022)
Maths test score at age 10 - 4th quartile			0.165***
			(0.024)
Maths test score at age 10 - missing			0.057
			(0.092)
Constant	5.515***	5.413***	5.287***
	(0.043)	(0.059)	(0.062)
Observations	17,916	17,916	17,916
R-squared	0.490	0.496	0.500

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Source: London Economics' analysis of BCS70 data

Table 22: Earnings returns associated with A levels in the presence of additional attainment (Men)

Control Variable	Basic Controls	Family and Child Background	Family and Child Background/ Maths and Reading scores at age 10
2+ STEM A levels	0.101**	0.078*	0.076
	(0.047)	(0.047)	(0.047)
2+ STEM A levels	0.016	-0.005	-0.011
	(0.068)	(0.065)	(0.064)
1 STEM A level	0.070	0.032	0.032
	(0.069)	(0.069)	(0.069)
1 STEM A level	0.077	0.068	0.069
	(0.051)	(0.052)	(0.052)
No STEM A levels	0.015	-0.007	-0.005
	(0.052)	(0.052)	(0.051)
No STEM A levels	-0.142***	-0.153***	-0.155***
	(0.046)	(0.046)	(0.046)
At least 1 A level grade A-C	0.105***	0.103***	0.101***
	(0.039)	(0.039)	(0.039)
Highest qualification: AS levels or 1 A level	0.217***	0.191***	0.178***
	(0.047)	(0.047)	(0.047)
Highest qualification: 2+ A levels, Scot higher/6th	0.117***	0.108***	0.095**
	(0.039)	(0.039)	(0.039)
Highest qualification: Diploma	0.106***	0.097***	0.094***
	(0.026)	(0.026)	(0.026)
Highest qualification: Degree, PGCE, Other Degree level	0.275***	0.244***	0.235***
	(0.023)	(0.023)	(0.022)
Highest qualification: Higher Degree	0.315***	0.279***	0.271***
	(0.036)	(0.035)	(0.036)
Ethnicity(non white)	-0.063	-0.036	-0.016
	(0.044)	(0.045)	(0.046)
Married/cohabiting	0.201***	0.194***	0.189***
	(0.016)	(0.016)	(0.016)
Married/cohabiting - missing	0.201*	0.214*	0.222**
	(0.108)	(0.112)	(0.109)
PT employment	-1.125***	-1.126***	-1.113***
	(0.064)	(0.065)	(0.066)
North West	0.063*	0.057	0.062
	(0.038)	(0.038)	(0.038)
Yorkshire and Humberside	0.044	0.036	0.047
	(0.040)	(0.041)	(0.041)
East Midlands	0.092**	0.075*	0.077*
	(0.041)	(0.041)	(0.041)
West Midlands	0.077**	0.066*	0.075*
	(0.039)	(0.039)	(0.039)
East of England	0.227***	0.213***	0.220***
	(0.039)	(0.039)	(0.039)
London	0.401***	0.373***	0.382***
	(0.040)	(0.040)	(0.041)

South East	0.210***	0.187***	0.196***
	(0.037)	(0.037)	(0.037)
South West	0.050	0.029	0.044
	(0.040)	(0.040)	(0.041)
Wales	0.019	0.021	0.027
	(0.046)	(0.046)	(0.047)
Scotland	0.061	0.068*	0.073*
	(0.040)	(0.040)	(0.041)
Northern Ireland	-0.744***	-0.745***	-0.733***
	(0.046)	(0.056)	(0.057)
Low birth-weight (less than 2.5kg)		-0.041	-0.024
		(0.037)	(0.037)
Low birth-weight - missing		-0.250*	-0.216
		(0.143)	(0.140)
Family owned house at age 10		0.056***	0.051**
		(0.020)	(0.020)
House owned - missing		0.078	0.074
		(0.056)	(0.057)
Parental occupation at age 10: Skilled manual or non-manual		0.071***	0.062**
		(0.026)	(0.026)
Parental occupation at age 10: Managerial/technical or professional		0.130***	0.123***
		(0.030)	(0.030)
Parental occupation at age 10:Missing		0.046	0.050
		(0.058)	(0.058)
Father left school at 15		0.029	0.032
		(0.042)	(0.042)
Father left school at 16		0.097**	0.094**
		(0.046)	(0.046)
Father left school at 17-18		0.076	0.071
		(0.047)	(0.047)
Father left school after 18		0.053	0.050
		(0.052)	(0.051)
Father left school - Missing		0.018	0.020
		(0.060)	(0.059)
Mother left school at 15		0.002	0.001
		(0.048)	(0.048)
Mother left school at 16		-0.006	-0.009
		(0.050)	(0.050)
Mother left school at 17-18		0.023	0.021
		(0.051)	(0.051)
Mother left school after 18		0.073	0.076
		(0.059)	(0.059)
Mother left school - Missing		0.098	0.083
		(0.129)	(0.125)
Age of mother at birth:20-24		-0.085**	-0.090***
		(0.033)	(0.033)
Age of mother at birth:25-29		-0.072**	-0.079**
		(0.033)	(0.034)
Age of mother at birth:30-39		-0.081**	-0.087**
		(0.036)	(0.036)
Age of mother at birth:40 plus		-0.078	-0.080
		(0.081)	(0.080)
Age of mother at birth:Missing		0.113	0.101
		(0.113)	(0.112)
Reading test score at age 10 - 2nd quartile			0.053*

			(0.029)
Reading test score at age 10 - 3rd quartile			0.067**
			(0.030)
Reading test score at age 10 - 4th quartile			0.026
			(0.035)
Reading test score at age 10 - missing			0.177*
			(0.093)
Maths test score at age 10 - 2nd quartile			0.123***
			(0.028)
Maths test score at age 10 - 3rd quartile			0.110***
			(0.031)
Maths test score at age 10 - 4th quartile			0.106***
			(0.034)
Maths test score at age 10 - missing			-0.067
			(0.095)
Constant	5.399***	5.326***	5.206***
	(0.056)	(0.080)	(0.083)
Observations	8,740	8,740	8,740
R-squared	0.336	0.348	0.353

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Source: London Economics' analysis of BCS70 data

Table 23: Earnings returns associated with A levels in the presence of additional attainment (Women)

Control Variable	Basic Controls	Family and Child Background	Family and Child Background/ Maths and Reading scores at age 10
2+ STEM A levels	0.264***	0.238***	0.213***
	(0.049)	(0.050)	(0.050)
2+ STEM A levels	0.130	0.104	0.078
	(0.089)	(0.088)	(0.089)
1 STEM A level	0.132**	0.109*	0.084
	(0.056)	(0.057)	(0.057)
1 STEM A level	0.049	0.045	0.026
	(0.064)	(0.064)	(0.065)
No STEM A levels	0.132***	0.107**	0.097**
	(0.049)	(0.049)	(0.049)
No STEM A levels	0.023	0.013	0.007
	(0.038)	(0.039)	(0.039)
At least 1 A level grade A-C	0.028	0.028	0.029
	(0.037)	(0.037)	(0.037)
Highest qualification: AS levels or 1 A level	0.166***	0.166***	0.149***
	(0.053)	(0.054)	(0.053)
Highest qualification: 2+ A levels, Scottish Higher	0.139***	0.129***	0.111***
	(0.038)	(0.038)	(0.038)
Highest qualification: Diploma	0.178***	0.169***	0.173***
	(0.025)	(0.025)	(0.024)
Highest qualification: Degree, PGCE, Other Degree level	0.372***	0.346***	0.323***
	(0.022)	(0.023)	(0.023)
Highest qualification: Higher Degree	0.408***	0.380***	0.355***
	(0.037)	(0.038)	(0.038)
Female			
Ethnicity(non white)	-0.154***	-0.136***	-0.105**
	(0.039)	(0.041)	(0.041)
Married/cohabiting	0.034**	0.029*	0.028*
	(0.016)	(0.016)	(0.016)
Married/cohabiting - missing	0.147	0.167	0.179
	(0.118)	(0.120)	(0.132)
PT employment	-0.882***	-0.883***	-0.880***
	(0.017)	(0.017)	(0.017)
North West	0.114***	0.102**	0.099**
	(0.043)	(0.043)	(0.043)
Yorkshire and Humberside	0.165***	0.154***	0.147***
	(0.044)	(0.044)	(0.044)
East Midlands	0.050	0.038	0.029
	(0.048)	(0.048)	(0.048)
West Midlands	0.136***	0.124***	0.128***
	(0.047)	(0.046)	(0.046)
East of England	0.155***	0.135***	0.122***
	(0.046)	(0.046)	(0.046)
London	0.399***	0.376***	0.378***

	(0.045)	(0.044)	(0.044)
South East	0.161***	0.140***	0.134***
	(0.043)	(0.043)	(0.043)
South West	0.038	0.011	0.006
	(0.046)	(0.046)	(0.046)
Wales	0.057	0.037	0.034
	(0.053)	(0.053)	(0.053)
Scotland	0.142***	0.147***	0.137***
	(0.046)	(0.046)	(0.046)
Northern Ireland			
Low birth-weight (less than 2.5kg)		-0.059	-0.054
		(0.038)	(0.037)
Low birth-weight - missing		0.240	0.206
		(0.339)	(0.347)
Family owned house at age 10		0.061***	0.055***
		(0.020)	(0.020)
House owned - missing		0.078	0.053
		(0.056)	(0.055)
Parental occupation at age 10: Skilled manual or non-manual		0.035	0.030
		(0.026)	(0.026)
Parental occupation at age 10: Managerial/technical or professional		0.050*	0.041
		(0.030)	(0.029)
Parental occupation at age 10:Missing		-0.017	-0.014
		(0.057)	(0.055)
Father left school at 15		0.030	0.031
		(0.040)	(0.040)
Father left school at 16		0.071*	0.058
		(0.042)	(0.042)
Father left school at 17-18		0.065	0.050
		(0.045)	(0.045)
Father left school after 18		0.025	0.018
		(0.048)	(0.048)
Father left school - Missing		0.004	-0.007
		(0.055)	(0.054)
Mother left school at 15		0.016	0.011
		(0.039)	(0.039)
Mother left school at 16		0.035	0.023
		(0.041)	(0.041)
Mother left school at 17-18		0.026	0.010
		(0.044)	(0.044)
Mother left school after 18		0.105**	0.084
		(0.052)	(0.052)
Mother left school - Missing		0.016	0.025
		(0.125)	(0.126)
Age of mother at birth:20-24		0.016	0.011
		(0.033)	(0.033)
Age of mother at birth:25-29		0.049	0.044
		(0.034)	(0.034)
Age of mother at birth:30-39		0.039	0.028
		(0.036)	(0.036)
Age of mother at birth:40 plus		0.071	0.062
		(0.075)	(0.074)

Age of mother at birth: Missing		-0.133	-0.144
		(0.333)	(0.341)
Reading test score at age 10 - 2nd quartile			-0.001
			(0.031)
Reading test score at age 10 - 3rd quartile			0.027
			(0.032)
Reading test score at age 10 - 4th quartile			0.034
			(0.035)
Reading test score at age 10 - missing			0.042
			(0.139)
Maths test score at age 10 - 2nd quartile			0.136***
			(0.029)
Maths test score at age 10 - 3rd quartile			0.168***
			(0.031)
Maths test score at age 10 - 4th quartile			0.211***
			(0.034)
Maths test score at age 10 - missing			0.154
			(0.138)
Constant	5.341***	5.199***	5.071***
	(0.065)	(0.086)	(0.090)
Observations	9,176	9,176	9,176
R-squared	0.462	0.467	0.473

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Source: London Economics' analysis of BCS70 data

A1.4 Employment– A levels combined with further attainment

Table 24: Employment returns associated with A levels in the presence of additional attainment (Men and Women combined)

Control Variable	Basic Controls	Family and Child Background	Family and Child Background/ Maths and Reading scores at age 10
2+ STEM A levels	0.010	0.008	0.005
	(0.018)	(0.018)	(0.018)
2+ STEM A levels	0.000	-0.000	-0.004
	(0.027)	(0.026)	(0.026)
1 STEM A level	0.024	0.019	0.016
	(0.020)	(0.020)	(0.020)
1 STEM A level	0.013	0.009	0.007
	(0.019)	(0.019)	(0.019)
No STEM A levels	-0.004	-0.007	-0.008
	(0.017)	(0.017)	(0.017)
No STEM A levels	0.005	0.001	-0.000
	(0.014)	(0.014)	(0.014)
At least 1 A level grade A-C	-0.014	-0.012	-0.011
	(0.014)	(0.014)	(0.014)
Highest qualification: AS levels or 1 A level	0.002	0.000	-0.003
	(0.018)	(0.018)	(0.018)
Highest qualification: 2+ A levels, Scottish Higher	0.038***	0.035***	0.031**
	(0.012)	(0.012)	(0.013)
Highest qualification: Diploma	0.017*	0.014	0.014
	(0.009)	(0.009)	(0.009)
Highest qualification: Degree, PGCE, Other Degree level	0.056***	0.053***	0.049***
	(0.007)	(0.007)	(0.008)
Highest qualification: Higher Degree	0.063***	0.061***	0.057***
	(0.011)	(0.011)	(0.011)
Female	-0.129***	-0.129***	-0.128***
	(0.005)	(0.005)	(0.005)
Ethnicity(non white)	-0.039**	-0.029*	-0.023
	(0.017)	(0.016)	(0.016)
Married/cohabiting	0.031***	0.029***	0.028***
	(0.006)	(0.006)	(0.006)
Married/cohabiting - missing	-0.095	-0.081	-0.080
	(0.062)	(0.059)	(0.059)
North West	0.011	0.008	0.007
	(0.015)	(0.015)	(0.014)
Yorkshire and Humberside	0.013	0.009	0.009
	(0.015)	(0.015)	(0.015)
East Midlands	0.028*	0.024	0.023
	(0.016)	(0.015)	(0.015)
West Midlands	0.013	0.009	0.010
	(0.015)	(0.015)	(0.015)
East of England	-0.018	-0.022	-0.024

	(0.015)	(0.015)	(0.015)
London	-0.007	-0.009	-0.008
	(0.015)	(0.015)	(0.015)
South East	-0.007	-0.012	-0.012
	(0.015)	(0.014)	(0.014)
South West	-0.008	-0.013	-0.011
	(0.015)	(0.015)	(0.015)
Wales	-0.007	-0.012	-0.012
	(0.017)	(0.017)	(0.017)
Scotland	0.009	0.012	0.010
	(0.016)	(0.015)	(0.015)
Northern Ireland	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)
Low birth-weight (less than 2.5kg)		-0.024	-0.018
		(0.015)	(0.014)
Low birth-weight - missing		0.027	0.019
		(0.083)	(0.090)
Family owned house at age 10		0.030***	0.027***
		(0.007)	(0.007)
House owned - missing		0.022	0.021
		(0.018)	(0.018)
Parental occupation at age 10: Skilled manual or non-manual		0.005	0.004
		(0.009)	(0.008)
Parental occupation at age 10: Managerial/technical or professional		-0.002	-0.005
		(0.010)	(0.010)
Parental occupation at age 10:Missing		-0.027	-0.027
		(0.019)	(0.019)
Father left school at 15		0.002	0.003
		(0.013)	(0.013)
Father left school at 16		0.014	0.013
		(0.014)	(0.014)
Father left school at 17-18		0.011	0.009
		(0.014)	(0.014)
Father left school after 18		0.005	0.005
		(0.015)	(0.015)
Father left school - Missing		-0.018	-0.016
		(0.022)	(0.022)
Mother left school at 15		0.003	-0.001
		(0.014)	(0.013)
Mother left school at 16		-0.005	-0.010
		(0.015)	(0.014)
Mother left school at 17-18		0.014	0.008
		(0.015)	(0.014)
Mother left school after 18		-0.029	-0.034*
		(0.018)	(0.018)
Mother left school - Missing		-0.023	-0.027
		(0.045)	(0.046)
Age of mother at birth:20-24		0.021*	0.020*
		(0.012)	(0.012)
Age of mother at birth:25-29		0.019	0.018
		(0.012)	(0.012)
Age of mother at birth:30-39		0.019	0.017
		(0.013)	(0.013)
Age of mother at birth:40 plus		0.001	-0.003

		(0.027)	(0.027)
Age of mother at birth: Missing		0.035	0.042
		(0.090)	(0.088)
Reading test score at age 10 - 2nd quartile			0.026**
			(0.010)
Reading test score at age 10 - 3rd quartile			0.020*
			(0.011)
Reading test score at age 10 - 4th quartile			0.011
			(0.012)
Reading test score at age 10 - missing			-0.020
			(0.043)
Maths test score at age 10 - 2nd quartile			0.030***
			(0.011)
Maths test score at age 10 - 3rd quartile			0.042***
			(0.012)
Maths test score at age 10 - 4th quartile			0.046***
			(0.013)
Maths test score at age 10 - missing			0.060
			(0.037)
Observations	26,302	26,302	26,302
Pseudo R-squared	0.0668	0.0724	0.0757

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Source: London Economics' analysis of BCS70 data. Note that we undertook different model specifications - controlling for and excluding degree level classification. When we control for degree level classification, we found that average returns declined by approximately 1/2 a percentage point compared to these results presented here.

Table 25: Employment returns associated with A levels in the presence of additional attainment (Men)

Control Variable	Basic Controls	Family and Child Background	Family and Child Background/ Maths and Reading scores at age 10
2+ STEM A levels	0.038**	0.032**	0.028*
	(0.017)	(0.016)	(0.017)
2+ STEM A levels	0.036	0.035	0.030
	(0.024)	(0.023)	(0.022)
1 STEM A level	0.032	0.026	0.022
	(0.020)	(0.019)	(0.019)
1 STEM A level	0.045**	0.039**	0.037*
	(0.021)	(0.020)	(0.019)
No STEM A levels	0.007	0.003	0.002
	(0.017)	(0.017)	(0.017)
No STEM A levels	0.015	0.015	0.013
	(0.015)	(0.014)	(0.014)
At least 1 A level grade A-C	-0.029*	-0.027	-0.026
	(0.017)	(0.017)	(0.016)
Highest qualification: AS levels or 1 A level	-0.023	-0.027	-0.029
	(0.021)	(0.021)	(0.020)
Highest qualification: 2+ A levels, Scottish Higher	0.008	0.006	0.002
	(0.012)	(0.012)	(0.012)
Highest qualification: Diploma	-0.010	-0.012	-0.013
	(0.010)	(0.009)	(0.009)
Highest qualification: Degree, PGCE, Other Degree level	0.014**	0.010	0.007
	(0.007)	(0.007)	(0.007)
Highest qualification: Higher Degree	0.009	0.004	-0.001
	(0.010)	(0.011)	(0.011)
Ethnicity(non white)	-0.017	-0.008	-0.002
	(0.014)	(0.013)	(0.012)
Married/cohabiting	0.081***	0.079***	0.077***
	(0.008)	(0.008)	(0.008)
Married/cohabiting - missing	-0.084	-0.066	-0.068
	(0.061)	(0.056)	(0.057)
North West	0.020	0.015	0.018
	(0.017)	(0.016)	(0.016)
Yorkshire and Humberside	0.030*	0.024	0.028*
	(0.017)	(0.016)	(0.016)
East Midlands	0.047***	0.041***	0.042***
	(0.017)	(0.015)	(0.016)
West Midlands	0.032*	0.026	0.030*
	(0.017)	(0.016)	(0.016)
East of England	0.029*	0.022	0.024
	(0.017)	(0.016)	(0.016)
London	0.022	0.016	0.019
	(0.017)	(0.016)	(0.016)
South East	0.030*	0.022	0.024
	(0.017)	(0.016)	(0.016)
South West	0.027	0.022	0.026
	(0.018)	(0.017)	(0.017)

Wales	0.021	0.015	0.019
	(0.020)	(0.018)	(0.018)
Scotland	0.017	0.017	0.017
	(0.018)	(0.016)	(0.017)
Northern Ireland	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)
Low birth-weight (less than 2.5kg)		-0.023	-0.017
		(0.015)	(0.013)
Low birth-weight - missing		0.022	0.027
		(0.027)	(0.023)
Family owned house at age 10		0.017**	0.014**
		(0.007)	(0.007)
House owned - missing		0.014	0.012
		(0.016)	(0.016)
Parental occupation at age 10: Skilled manual or non-manual		-0.003	-0.004
		(0.008)	(0.008)
Parental occupation at age 10: Managerial/technical or professional		-0.006	-0.008
		(0.009)	(0.009)
Parental occupation at age 10: Missing		-0.026	-0.024
		(0.019)	(0.018)
Father left school at 15		-0.006	-0.004
		(0.012)	(0.013)
Father left school at 16		0.013	0.013
		(0.013)	(0.014)
Father left school at 17-18		-0.002	-0.001
		(0.014)	(0.015)
Father left school after 18		0.006	0.008
		(0.014)	(0.014)
Father left school - Missing		-0.017	-0.015
		(0.021)	(0.021)
Mother left school at 15		0.001	-0.002
		(0.014)	(0.013)
Mother left school at 16		0.007	0.001
		(0.015)	(0.014)
Mother left school at 17-18		0.010	0.004
		(0.015)	(0.014)
Mother left school after 18		-0.012	-0.018
		(0.018)	(0.018)
Mother left school - Missing		-0.005	-0.012
		(0.032)	(0.033)
Age of mother at birth:20-24		0.019	0.020*
		(0.012)	(0.012)
Age of mother at birth:25-29		0.019	0.019
		(0.012)	(0.012)
Age of mother at birth:30-39		0.022*	0.021*
		(0.013)	(0.012)
Age of mother at birth:40 plus		-0.020	-0.024
		(0.033)	(0.034)
Age of mother at birth: Missing		0.012	0.010
		(0.040)	(0.038)
Reading test score at age 10 - 2nd quartile			0.021**
			(0.010)

Reading test score at age 10 - 3rd quartile			0.016
			(0.011)
Reading test score at age 10 - 4th quartile			0.017
			(0.012)
Reading test score at age 10 - missing			0.003
			(0.038)
Maths test score at age 10 - 2nd quartile			0.002
			(0.012)
Maths test score at age 10 - 3rd quartile			0.026**
			(0.012)
Maths test score at age 10 - 4th quartile			0.020
			(0.013)
Maths test score at age 10 - missing			0.018
			(0.036)
Observations	12,175	12,175	12,175
Pseudo R-squared	0.0615	0.0734	0.0801

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Source: London Economics' analysis of BCS70 data. Note that we undertook different model specifications - controlling for and excluding degree level classification. When we control for degree level classification, we found that average returns declined by approximately 1/2 a percentage point compared to these results presented here.

Table 26: Employment returns associated with A levels in the presence of additional attainment (Women)

Control Variable	Basic Controls	Family and Child Background	Family and Child Background/ Maths and Reading scores at age 10
2+ STEM A levels	-0.025	-0.024	-0.028
	(0.031)	(0.031)	(0.032)
2+ STEM A levels	-0.071	-0.072	-0.073
	(0.054)	(0.053)	(0.054)
1 STEM A level	0.009	0.003	0.001
	(0.034)	(0.034)	(0.034)
1 STEM A level	-0.042	-0.043	-0.046
	(0.033)	(0.033)	(0.033)
No STEM A levels	-0.022	-0.023	-0.023
	(0.029)	(0.029)	(0.029)
No STEM A levels	-0.010	-0.015	-0.015
	(0.024)	(0.024)	(0.024)
At least 1 A level grade A-C	-0.004	-0.000	-0.000
	(0.023)	(0.023)	(0.023)
Highest qualification: AS levels or 1 A level	0.025	0.023	0.019
	(0.028)	(0.028)	(0.028)
Highest qualification: 2+ A levels, Scottish Higher	0.072***	0.066***	0.061***
	(0.021)	(0.021)	(0.022)
Highest qualification: Diploma	0.043***	0.040***	0.040***
	(0.014)	(0.014)	(0.014)
Highest qualification: Degree, PGCE, Other Degree level	0.102***	0.098***	0.093***
	(0.013)	(0.013)	(0.013)
Highest qualification: Higher Degree	0.125***	0.125***	0.121***
	(0.018)	(0.017)	(0.018)
Ethnicity(non white)	-0.065**	-0.055*	-0.049*
	(0.030)	(0.030)	(0.030)
Married/cohabiting	-0.023**	-0.027***	-0.028***
	(0.009)	(0.009)	(0.009)
Married/cohabiting - missing	0.008	0.009	0.016
	(0.094)	(0.092)	(0.090)
North West	-0.002	-0.006	-0.007
	(0.023)	(0.023)	(0.023)
Yorkshire and Humberside	-0.006	-0.010	-0.010
	(0.024)	(0.024)	(0.024)
East Midlands	0.004	-0.003	-0.003
	(0.025)	(0.025)	(0.025)
West Midlands	-0.010	-0.013	-0.014
	(0.024)	(0.024)	(0.024)
East of England	-0.073***	-0.076***	-0.079***
	(0.025)	(0.025)	(0.024)
London	-0.042*	-0.044*	-0.042*
	(0.025)	(0.024)	(0.024)
South East	-0.049**	-0.054**	-0.054**
	(0.023)	(0.022)	(0.022)
South West	-0.048**	-0.056**	-0.054**
	(0.024)	(0.024)	(0.024)

Wales	-0.038	-0.045*	-0.045*
	(0.027)	(0.027)	(0.027)
Scotland	-0.005	0.000	-0.001
	(0.025)	(0.025)	(0.025)
Northern Ireland	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)
Low birth-weight (less than 2.5kg)		-0.016	-0.012
		(0.023)	(0.023)
Low birth-weight - missing		-0.008	-0.027
		(0.215)	(0.230)
Family owned house at age 10		0.044***	0.041***
		(0.012)	(0.012)
House owned - missing		0.030	0.029
		(0.031)	(0.031)
Parental occupation at age 10: Skilled manual or non-manual		0.014	0.013
		(0.015)	(0.015)
Parental occupation at age 10: Managerial/technical or professional		0.001	-0.001
		(0.017)	(0.017)
Parental occupation at age 10:Missing		-0.022	-0.023
		(0.031)	(0.031)
Father left school at 15		0.009	0.007
		(0.022)	(0.022)
Father left school at 16		0.016	0.012
		(0.023)	(0.023)
Father left school at 17-18		0.024	0.021
		(0.024)	(0.024)
Father left school after 18		0.002	0.001
		(0.027)	(0.026)
Father left school - Missing		-0.024	-0.022
		(0.037)	(0.037)
Mother left school at 15		0.008	0.003
		(0.023)	(0.022)
Mother left school at 16		-0.011	-0.018
		(0.024)	(0.024)
Mother left school at 17-18		0.022	0.015
		(0.025)	(0.024)
Mother left school after 18		-0.042	-0.049*
		(0.030)	(0.030)
Mother left school - Missing		-0.048	-0.051
		(0.084)	(0.084)
Age of mother at birth:20-24		0.019	0.018
		(0.020)	(0.020)
Age of mother at birth:25-29		0.016	0.016
		(0.020)	(0.020)
Age of mother at birth:30-39		0.013	0.011
		(0.021)	(0.021)
Age of mother at birth:40 plus		0.022	0.019
		(0.039)	(0.039)
Age of mother at birth: Missing		0.097	0.107
		(0.166)	(0.160)
Reading test score at age 10 - 2nd quartile			0.028*
			(0.017)
Reading test score at age 10 - 3rd quartile			0.020
			(0.018)

Reading test score at age 10 - 4th quartile			0.002
			(0.020)
Reading test score at age 10 - missing			-0.047
			(0.069)
Maths test score at age 10 - 2nd quartile			0.051***
			(0.018)
Maths test score at age 10 - 3rd quartile			0.052***
			(0.020)
Maths test score at age 10 - 4th quartile			0.066***
			(0.021)
Maths test score at age 10 - missing			0.095
			(0.059)
Observations	14,127	14,127	14,127
Pseudo R-squared	0.0239	0.0298	0.0326

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Source: London Economics' analysis of BCS70 data. Note that we undertook different model specifications - controlling for and excluding degree level classification. When we control for degree level classification, we found that average returns declined by approximately 1/2 a percentage point compared to these results presented here.

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