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DO PROFESSIONAL YEAR PLACEMENTS MATTER FOR JOB QUALITY? THE CASE OF ECONOMICS GRADUATES

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Do professional year placements matter for job quality? The case of economics graduates

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Abstract

We study whether the completion of an optional professional year placement during undergraduate studies enhances job quality, in terms of earnings, job security and career fit, for economics graduates from a UK university. Using linear and discrete choice models, we estimate the effect of doing a professional year placement on four graduate outcomes that capture job quality and use a rich data set to control for demographics, educational background, academic achievement, degree, and graduate job characteristics. To account for possible self-selection bias, we use propensity score matching. We find that graduates who did a professional year placement earn 6.5% higher salaries than non-placement graduates, but the salary gap becomes statistically insignificant once we control for self-selection. Similarly, a professional year placement has no effect on job security. However, we find a positive effect of professional year placement on career fit: placement graduates are more likely to find jobs that fit their career plans than non-placement graduates, which holds even after controlling for self-selection. The empirical findings also show that job characteristics, like location and type of industry, and school background are also important factors contributing to graduates' employment quality. Finally, we find no differences in job quality due to gender.

Keywords: Employability; Placement; Job Quality; Salaries; Economics.

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1 Introduction

Transitioning from higher education to employment is a major concern of the sector's stakeholders, especially when the universities' funding system relies on tuition fees to be sustainable. In the UK, the increased in tuition fees and the replacement of maintenance grants with loans to cover students' living costs[1] have increased the financial burden of a degree and, as a result, students demand better services from the higher education sector. At the same time, employers typically report that graduates are not 'work ready' when leaving university, often lacking work experience, life experience or maturity [DBIS (2015)], the ability to communicate clearly in writing and wider application of knowledge [EN (2019)]. As a consequence, universities are under increasing pressure to better prepare students for the labour market. Against this backdrop, universities have adopted pedagogical and curricular strategies to promote their graduates' employability [e.g. Bridgstock and Jackson (2019), Healy et al. (2022a), Healy et al. (2022b)]. Among these strategies, work-integrated learning, which involves integrating theory and work-related practice in curriculum design, enables students to develop employability skills, apply knowledge and broaden their networks [Jackson (2018)]. Work-integrated learning in the form of professional year placement provides students with the opportunity to gain a year-long 'trial' of the world of work during their studies, shape their 'graduate identity' [Holmes (2015), Jackson (2016)], and better prepare them for the competitive labour market. Many UK universities offer degrees with an optional professional year placement (also known as 'sandwich' programme or industrial placement) that is fully embedded in their learning and teaching contexts (e.g. they are credit bearing and assessed), typically between the second and final year of the degree.

Despite the increasing popularity of professional year placements in higher education [Inceoglu et al. (2019)], evidence of their impact on graduate labour market outcomes remains scant and inconsistent. Regarding income, some studies suggest that professional year placement is associated with higher earnings upon graduation [e.g. Brooks and Youngson (2016), Smith et al. (2018)], but others reported no statistically significant differences in earnings between placement graduates and non-placement graduates [e.g. Wilton (2012), Moores and Reddy (2012)]. There is some evidence that placement graduates are more

[1] Key reforms included the increase in the maximum tuition fees from £3,250 to £9,000 in 2011 and further to £9,250 in 2012, and the replacement of maintenance grants with maintenance loans from 2016/17 to cover living costs. Further information on student finance for undergraduates is available at https://www.gov.uk/student-finance/continuing-fulltime-students.

likely to be in employment [Inceoglu et al. (2019)] and work full-time in an appropriate graduate role than non-placement graduates [Moores and Reddy (2012), Brooks and Youngson (2016)]. However, there is evidence that non-placement graduates reported higher levels of job security than placement graduates [Wilton (2012)], and that there was no significant association between placements and employment among graduates with lower second-class (50-60%) degree classification [Moores and Reddy (2012)].

Previous studies have attempted to quantify the differences in employability outcomes, especially the salary gap, between placement and non-placement graduates using parametric t-tests [e.g. Wilton (2012), Moores and Reddy (2012)] or non-parametric tests [e.g. Brooks and Youngson (2016)]. However, previous studies do not control for key possible factors (like academic performance and graduate job characteristics) that can explain differences in employability outcomes, hence a causal relationship has not yet been established in the literature. Moreover, as enrolment in professional year placement programmes is typically done on a voluntary basis, students with certain characteristics or background may be more inclined to participate than others. To the best of our knowledge, the literature has mostly overlooked this self-selection issue; that is, for example, more academically oriented or motivated students are more likely to participate in a professional year placement, and therefore would have achieved better graduate outcomes (e.g. earning higher salaries and being in the desired career path) even if they had not done a placement.[2] As St Clair-Thompson and Chivers (2019) points out, further supported by Margaryan et al. (2019), 'self-selection has not been considered to the same extent in studies of employability'. Therefore, this is an important gap in the literature and this study contributes towards addressing it.

We investigate whether the completion of an optional professional year placement enhances job quality, in terms of earnings, job security (permanent and full-time employment) and career fit, for three cohorts of economics graduates from a UK university. We analyse four graduate outcomes for job quality taking into account a wide range of controls that includes demographics, educational background, academic achievement, degree, graduate job characteristics and cohort effects. We perform regression analysis that involves linear and discrete choice models, and propensity score matching to control for possible selection bias. These methods allow us to provide evidence on the causal effect of professional year

[2] Jones et al. (2015) finds evidence of self-selection, but in the association between work placement and final-year academic performance.

placement participation on graduate job quality.

Our results from the linear regression analysis show that graduates who did a professional year placement earn 6.5% higher salaries than non-placement graduates, but the results from propensity score matching show that the salary gap is statistically insignificant. This suggests that not only is it important to account for a wide range of factors that may determine salaries but also to control for self-selection. Similarly, a professional year placement has no effect on job security: doing a professional year placement provides no benefits in terms of securing permanent or full-time employment. However, we find a robust positive effect of professional year placement on career fit: placement graduates are more likely to find jobs that fit their career plans than non-placement graduates, which holds after controlling for selection bias. Job characteristics, like location and type of industry, and school background are also important factors that matter for employment quality. Finally, we find no differences in job quality due to gender.

All in all, this study contributes to the discussion in Higher Education (HE) on how universities enable graduates to achieve their employment and career goals [Advance HE (2020), Healy et al. (2022b)]. We provide empirical evidence confirming that work-integrated learning in the form of a professional year placement offers long-term benefits to graduates. Indeed, the 'added-value' of professional year placements in terms of career fit is substantial and more consequential than short-term benefits, like higher earnings, because it contributes to how quickly graduates can reach their career goals. This study, as McGuinness et al. (2016) argue, supports the idea that professional year placements can improve the quality of graduate employment, and, therefore, universities offering professional year placements can play an important role in enhancing the transition from university to the graduate labour market.

In the next section we describe the data set and estimation methods. Section 3 presents the analysis and findings, while section 4 further discusses the key results and the implications for HEIs. Finally, section 5 concludes the paper.

2 Data and methodology

In this section we describe our data set, define the variables for the analysis and explain the econometric methods to estimate the potential effect of student participation in the professional year placement on job quality.

2.1 Data

We collected information from three cohorts (2016/17, 2017/18 and 2018/19) of University of Surrey economics graduates, from two different sources. First, demographic characteristics, educational background, academic achievement, programme enrolments, and student participation in the professional year placement programme were obtained from the University's records. The second source of information involves three surveys carried out by the Higher Education Statistics Agency (HESA). These are the Graduate Outcomes (GO) 2017/18 and 2018/19 surveys and the Destination of Leavers from Higher Education (DLHE) 2016/17 survey, which were used to obtain data for graduate outcomes and job characteristics.[3] The descriptive statistics of our sample are discussed in Section 3.1. Next, we provide the definitions of the variables for our analysis.

2.1.1 Response variables

We consider four graduate outcomes (response variables) that capture the quality of graduate employment. The first outcome is the log of *real earnings*, measured by the annual graduate salary and controlling for inflation using the consumer price inflation index (2015 is the base year) from the Office for National Statistics. To analyse job security, we consider the type of graduate employment contract, that is, whether it is permanent and full-time. As a result, we created two response variables: a dummy variable equal to 1 for *permanent* employment and 0 otherwise, and a dummy variable equal to 1 for *full-time* employment and 0 otherwise. Finally, *career fit* is captured by a dummy variable equal to 1 if the main reason to take up employment was because the job fitted into the graduate's career plan or because it was the type of work the graduate wanted and 0 otherwise.

2.1.2 Explanatory variables

Professional year placement participation. Students can either enrol in the standard three-year programme or the four-year 'sandwich' programme, known as Professional Training Year (PTY) at the University of Surrey. The latter programme offers an oppor-

[3]The GO is an annual survey conducted 15 months after graduates completed their course. The DLHE, which is now discontinued, collected similar information to the GO but only 6 months after graduation. The GO survey has broader scope, not only capturing the current employment status of recent graduates, but also asks respondents to reflect on the contribution of their education to their employment.

tunity to go on a professional year placement upon completion of the second year of their undergraduate programme. Students apply for placements[4] during the second year and if successful, they go on a placement in the third year. Although the University supports students through the employability and careers services (e.g. careers fairs, job application and preparation for assessment centres), a professional year placement is not guaranteed. The typical duration of a professional year placement is 52 weeks. These students then return to the University for the final (fourth) year of their studies. In contrast, those students who did not manage to secure a placement proceed directly to the third year of their studies along with the students who did not enrol in the 'sandwich' programme. To capture student participation in the professional year placement programme, we include a *PTY* dummy variable equal to 1 if the graduate did a professional year placement and 0 otherwise.

Demographic variables. We include a *gender* dummy variable equal to 1 for male students and 0 for female students, *age* on entry to University, a *fee status* dummy variable equal to 1 for UK students and 0 for EU or overseas students. To capture heterogeneity among students in terms of their ethnic background we included information from the students' self-reported ethnicity completed when they first registered with the University. For simplicity, we created two dummy variables: *ethnic (White)* equal to 1 if the student reported a white ethnicity and 0 otherwise, *ethnic (Asian/Other)* equal to 1 if the student reported an 'Asian' or other non-White ethnicity and 0 otherwise.

Academic achievement and undergraduate degree. To capture students' academic achievement we take into account the student's academic performance at different stages of their studies; that is, the average mark in first, second and final year of the student's programme. We also considered the degree mark which is a weighted average of the academic performance in second and final year. Students enrolled in one of the four programmes offered by the School of Economics: Economics BSc, Business Economics BSc, Economics and Finance BSc, Economics and Mathematics BSc. We created dummy variables to account for differences across programmes. From the employers point of view, some may be interested in graduates from any of these programmes, but other employers

[4]Students have access to a list of available placements opportunities on the University's virtual learning environment. Alternatively, students can self-source their placement with the approval of the programme director. In both cases, students submit their own applications. Although the University does not impose requirements in terms of academic performance, employers typically use first-year marks to assess candidates [Arsenis and Flores (2019)].

might prefer to hire graduates with more specific knowledge.

Educational background. To control for heterogeneity among students in relation to their educational background (i.e. before joining the University), we created different dummy variables according to the type of school they attended: *school (Academy /Comprehensive)* equal to 1 if the student graduated from an academy or comprehensive school and 0 otherwise, *school (Grammar/Independent)* equal to 1 if the student graduated from a grammar or an independent school and 0 otherwise, and, finally, *school (Sixth form/Tertiary)* equal to 1 if the student graduated from a sixth form or tertiary college and 0 otherwise. Academies, comprehensive and grammar schools are funded by the government, while independent schools are privately funded. Sixth form and tertiary colleges cater for older (16 to 19 years old) students who are interested in acquiring advanced school-level qualifications, like A-levels which are necessary to access higher education in the UK.

Graduate job characteristics. We included a *job location* dummy variable equal to 1 if the graduate job location is in London and 0 otherwise, and we distinguish jobs by industry to capture the different characteristics of industrial sectors in which employers operate. We created several dummy variables based on industry classification: *industry (EFB)* equal to 1 if the employer operates in the economics/finance/banking sector and 0 otherwise, *industry (Prof/Account)* equal to 1 if the employer operates in the professional services or accounting sector and 0 otherwise, *industry (Tech/Gov)* equal to 1 if the employer operates in the technology sector or is a government institution and 0 otherwise, and, finally, *industry (Other)* equal to 1 if the employer operates in an industry that is different to the aforementioned industries.

Cohorts. To take into account possible differences across cohorts, we created dummy variables that capture the cohorts of our sample.

2.2 Estimation methods

To study whether the completion of an optional professional year placement matters for job quality, we use regression analysis for each graduate outcome: earnings, permanent employment, full-time employment, and career fit. Due to the different types of response variables (i.e. continuous versus binary), we use two baseline estimation methods. Specifically, our econometrics approach starts with a Mincer log earnings specification [Mincer (1974)] of the form:

$$\ln(w_i) = \alpha + \beta PTY_i + \mathbf{x}_i'\boldsymbol{\gamma} + u_i, \tag{1}$$

where w_i denotes real earnings of student i, and PTY_i is the dummy variable indicating whether student i completed a professional year placement year or not. We control for a vector of individual regressors, $\mathbf{x}_i$, including demographic characteristics, educational background, academic achievement, undergraduate programme information, graduate job characteristics, and cohort. Finally, u_i is an individual-level error term. We estimate model 1 using Ordinary Least Square (OLS). The estimate of the coefficient for PTY provides the mean effect of student participation in the professional year placement programme on graduate earnings, after controlling for other explanatory variables.

To study the effect of professional year placement on job security and career fit, we follow a discrete choice model [Greene (2008)] to statistically relate the students' participation (or not) in the professional year placement programme to permanent employment, full-time employment and career fit. We use the following Logit model:

$$P(\mathrm{Y} = 1|\mathbf{x}) = \Lambda(\alpha + \beta PTY + \mathbf{x}'\boldsymbol{\gamma}) = \frac{\exp(\alpha + \beta PTY + \mathbf{x}'\boldsymbol{\gamma})}{1 + \exp(\alpha + \beta PTY + \mathbf{x}'\boldsymbol{\gamma})}, \tag{2}$$

where $P(\mathrm{Y} = 1|\mathbf{x})$ is the probability that the graduate outcome is equal to one (e.g. take the employment because the job fitted into the graduate's career plan) given the set of explanatory variables $\mathbf{x}$, and Λ is the logistic cumulative distribution function. The model will also be used to predict how the relevant graduate outcome will change if the key variable of interest changes (e.g. how career fit changes with the participation in the professional year placement programme).

Because we observe graduates who did and did not participate in the professional year placement programme with no clear rule for programme assignment (e.g. randomised assignment), there is a potential issue of selection bias: the reasons for which a student participates in the professional year placement programme might also determine their graduate outcomes. For instance, students with specific abilities and/or motivations are more likely to participate in the professional year placement programme, but also secure high-quality graduate jobs. As a consequence, estimating the impact of professional year placement participation on graduate outcomes is challenging. To deal with the possible selection bias, our alternative estimation strategy to OLS and Logit is propensity score matching analysis.

Using standard notation from the literature, we are interested in estimating the Average Treatment Effect (ATE) and Average Treatment Effect on the Treated (ATET):

$$\begin{aligned} \text{ATE} &= E[Y(1)] - E[(Y(0)], \text{ and} \quad (3) \\ \text{ATET} &= E[Y(1) \,|\, PTY = 1] - E[Y(0) \,|\, PTY = 1]. \quad (4) \end{aligned}$$

The ATE is simply the mean difference in the graduate outcome due to participation in the professional year placement programme. The term $E[Y(1)]$ is the outcome when students participate in the professional year placement programme ($PTY = 1$), and the term $E[(Y(0)]$ is the same outcome without programme participation ($PTY = 0$). For real earnings, the ATE is the difference between a graduate's earnings after participation in the professional year placement and the same graduate's earnings if he or she had not participated in the professional year placement. Because the graduate cannot be observed simultaneously with and without professional year placement, the term $E[(Y(0)]$ represents the counterfactual (i.e. the outcome of a placement graduate if the student had not participated in the professional year placement programme). The ATET focuses on those graduates who participated in the professional year placement and estimates the difference in the graduate outcome if they had not done the professional year placement. We therefore need to identify a 'treatment' group and a 'comparison' group that are statistically identical, on average, in the absence of the professional year placement programme. Specifically, for each placement student (i.e. in the treatment group) and each non-placement student (i.e. in the comparison group), we need to compute the probability that the student will participate in the professional year placement programme (known as propensity score) based on the observed values of his/her characteristics (i.e. explanatory variables). To estimate ATE and ATET we calculate the propensity score:

$$pscore = P[PTY = 1|x_1, x_2, \ldots],$$

where $x_1, x_2, \ldots$ are the control variables. The propensity score is the probability of a student going on placement ($PTY = 1$) conditional on the explanatory variables. We match placement ($PTY = 1$) and non-placement ($PTY = 0$) individuals that are close to each other in terms of $pscore$.

To estimate the ATE and the ATET we follow the literature [e.g. Garrido et al. (2014) and Gertler et al. (2016)] to compute the propensity scores, to analyse the distribution of propensity scores in the treated ($PTY = 1$) and comparison ($PTY = 0$) groups, and choose the best matching estimator. We confirmed that propensity scores have a similar distribution in the treated and comparison groups (the balancing property is satisfied). Finally, among five matching and weighting estimators, Kernel matching showed the best performance. Detailed explanation of our procedure is available in the Appendix.

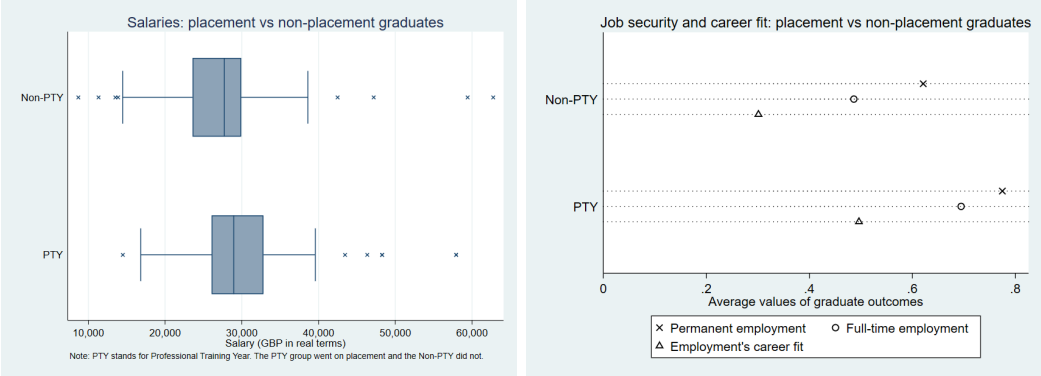
3 Analysis and results

3.1 Descriptive statistics

A total of 557 economics students graduated across the three cohorts of this study, of whom approximately 47% completed a professional year placement. The sample size for each graduate outcome depends on the response rate of the surveys' participants: 35.2% responded to the earnings question, 53.3% responded to the permanent employment question, 69.3% responded to the full-time employment question, and 40.2% responded to the career fit question.[5]

Figure 1 shows the differences for each graduate outcome between placement and non-placement graduates. As shown in figure 1a, students who participated in the professional year placement earned on average higher salaries (the difference in mean/median is £2,149/£1,235) than students who did not participate in the professional year placement. Interestingly, the range of salaries is wider for non-placement graduates, which suggests that a few of them are able to find high-paying jobs, but other non-placement graduates end up with low-paying jobs. Also, as shown in figure 1b, placement graduates are more likely to find permanent jobs, are more likely to be in full-time positions, and are more likely to find employment that fits better with their career aspirations than non-placement graduates.

[5] According to the HESA, the GO survey response rate at national level is around 50% [HESA (2020)]. Additionally, because of the voluntary response characteristic of the DLHE and GO surveys, we consider the potential issue of sample selection bias; that is, the surveyed sample is not a randomly selected sample. To investigate this matter, we followed Heckman's procedure for sample selection bias [Heckman (1979)], and we found no evidence of such bias in our data.



(a) Graduate salaries. (b) Job security and career fit.

Figure 1: Graduate outcomes between placement and non-placement economics graduates.

In terms of students' characteristics, the placement graduates are more likely to be British and of white ethnicity, and they have achieved a higher academic performance (across all years) than non-placement graduates. Regarding labour market entry across industries, a larger proportion of placement graduates find jobs in the economic/finance/banking sector than non-placement graduates. The descriptive statistics of all variables and for the two groups (placement and non-placement graduates) are shown in Table 4 in the Appendix.

3.2 The effect of professional year placement on graduates' earnings

Table 1 reports the results of the estimates for the effect of PTY on earnings for graduates with full-time employment.[6] We start presenting the OLS results with a simple model, M1, that includes only the PTY dummy to capture the possible professional year placement effect on graduate earnings. Next, in M2, beside PTY, we also include demographics, educational background and academic achievement as additional factors. Our richest OLS model, M3, in addition to previous covariates, takes into account job characteristics and cohort effects too. Our models do not include the full list of explanatory variables as shown in Table 4 as we followed a variable selection process to create models that fit our data better. The OLS results including each covariate are in Table 5 in the Appendix. The last two columns report the ATE and ATET.

[6] In our sample, the majority of graduates who reported their earnings (approximately 79%) were full-time employees. Also, we focus on this type of employment as this is more likely to be a permanent,

Table 1: Effect of professional year placement on earnings.

Controls	OLS			ATE	ATET
	M1	M2	M3		
PTY	0.1017**	0.0779*	0.0652*	0.0500	0.0431
	(0.0436)	(0.0399)	(0.0350)	(0.0536)	(0.0655)
Demographics	No	Yes	Yes	Yes	Yes
Educational background	No	Yes	Yes	Yes	Yes
Academic achievement	No	Yes	Yes	Yes	Yes
Job characteristics	No	No	Yes	Yes	Yes
Cohorts	No	No	Yes	Yes	Yes
Possible selection-bias	No	No	No	Yes	Yes
Observations	196	171	167	173	173
F	5.44	2.39	6.19		
p-value	0.0207	0.0182	0.0000		
R^2	0.0352	0.0901	0.3065		

Note: The table shows the regression coefficients of PTY from the OLS model, the equivalent ATE and ATET estimates, and robust standard errors in parentheses. The response variable is the natural logarithm of real salaries. ** and * denote significance at the 5% and 10% level, respectively.

We find a positive and statistically significant effect of placement on earnings across the OLS models, but the size of the effect falls as we add control variables, from M1 to M3. Specifically, placement graduates earn on average 6.5% higher salaries than non-placement graduates according to M3. Once we control for possible selection bias (ATE), the estimated coefficient for the salary gap is still positive but statistically insignificant. Similarly, the estimated coefficient for the ATET reveals that placement graduates earn no higher salaries than if they had not done a professional year placement.

Conversely, we find that educational background, job characteristics, and cohorts matter for earnings. In particular, graduates from sixth form or tertiary college earn lower salaries than graduates from academies or comprehensive schools (reference category). In terms

career-oriented job, unlike part-time employment which is typically temporary.

of job characteristics, as expected, graduates who work in London earn higher salaries than those in the rest of the country, and graduates who work in the professional services, accounting, technology, government or sectors not included in the identified categories earn lower salaries than graduates who work in the economics/finance/banking sector. Finally, 2017/18 graduates earned higher salaries than 2016/17 and 2018/19 graduates.

3.3 The effect of professional year placement on graduates' job security and career fit

Table 2 reports the results of the estimates for the effect of PTY on job security and career fit, also controlling for the M3 covariates. To simplify the exposition, we focus on PTY, while the full set of results including each covariate are in Table 6 in the Appendix. We start presenting results for the Logit model, including the partial effect of the placement variable on each graduate outcome. The last two columns report the estimates for the ATE and ATET.

Table 2: Effect of professional year placement on job security and career fit.

Graduate outcome	Logit partial effect	ATE	ATET
Permanent employment			
	0.0749	0.1563**	0.1298
	(0.0648)	(0.0678)	(0.0806)
	237	258	258
Full-time employment			
	0.0747	0.0272	-0.0045
	(0.0552)	(0.0573)	(0.0561)
	237	258	258
Career fit			
	0.1711**	0.1713*	0.1649
	(0.0805)	(0.0873)	(0.1031)
	185	202	202

Note: For each graduate outcome, the table shows the partial effect of PTY from the Logit model, the ATE and ATET estimates, robust standard errors in parentheses, and the number of observations. * and ** denote statistical significance at the 10% and 5% level, respectively.

We find limited evidence supporting a positive effect of professional year placement on graduates' job security. Examining both graduate outcomes related to job security, we find that the partial effect of PTY on permanent and full-time employment are with the expected sign, but statistically insignificant. Looking at the results from the propensity score matching, only the estimated ATE for permanent employment is statistically significant. All in all, the results suggest that there is no solid evidence indicating that placement matters for job security.

On the contrary, we find evidence of a positive effect of professional year placement on career fit. The estimated partial effect, from the Logit model, suggests that placement graduates are on average 17.1 percentage points more likely to find a job that fits their career aspirations than non-placement graduates. This positive effect of professional year placement on career fit is statistically significant even after taking into account possible selection bias. In particular, the ATE estimate indicates that career-aligned employment if all graduates had gone on placement would have been 17.1 percentage points higher on average than if none of the graduates had gone on placement.

Other relevant determinants of career fit or job security are the following. Graduates employed in the professional services or accounting sector are less likely to be employed on a full-time basis than graduates employed in the economics/finance/banking sector. Similarly, graduates employed in an industry other than the identified categories are less likely to be employed on a permanent or full-time basis or be in a job that fits their career aspirations than graduates employed in the economics/finance/banking sector.

We have performed a number of robustness checks, including extensions to the M3 model, which are available from the authors on request. For example, to capture regional effects we created dummies (e.g. South East and Greater London dummy) based on reported domicile postcodes and added them to M3. Largely, we observe no statistically significant regional effects. We also explored the possibility that programme enrolment might determine job quality by adding the dummy variables for the different programmes to M3. Overall, our key results remain qualitatively unchanged even after adding these covariates.

Summing up, the previous results show that participation in the professional year placement programme has a positive effect on career fit, a possible positive effect on earnings, but no effect on job security.

4 Discussion

In this section we discuss our key results and our contribution to the literature, their implications for HEIs, the issue of self-selection, and the gender gap in job quality.

As presented in the introduction, previous studies on professional year placements have examined the differences in outcomes between placement and non-placement graduates, without considering several possible factors that might explain such differences. Our results show that graduate outcomes are explained not only by participation in the professional year placement programme, but other factors too. The estimated coefficient for placement in M1 (see Table 1), a simple and 'naive' model, indicates a 10.2% earnings gap in favour of placement graduates. This earnings gap falls to 6.5% after controlling for other factors, and vanishes when taking into account possible selection bias. Similarly, the effect of professional year placement on other outcomes either falls or becomes statistically insignificant after controlling for other factors.[7] Therefore, our findings suggest that previous studies might have overestimated the effect of professional year placement on graduate salaries and graduate employment.

Our results provide valuable insights for HEIs in terms of graduate employability. First, the professional year placement offers long-term benefits to students: placement graduates are more likely to end up in graduate jobs that are close to their career aspirations than non-placement graduates. By participating in the professional year placement programme, graduates gain a year-long 'trial' of the world of work during their studies, which allows them to shape their 'graduate identity' [Holmes (2015), Jackson (2016)] and benefit in terms of career progression. The estimated positive career fit effect is substantial and more consequential than short-term benefits, like higher earnings, because it determines how quickly graduates can reach their career goals. This is supported by Inceoglu et al. (2019)'s theoretical framework that suggests a positive effect of the placement experience on career resources and, subsequently, on career outcomes, which is underpinned by an interplay between identity change and exposure to new social contexts while on placement. Similarly, the Graduate Capital Model, emphasises the importance of different employability-oriented resources, like social, cultural, and identity capital, for career development [Tomlinson et al. (2022)]. These capitals can be developed during placements as students expand their networks (social capital), appreciate organisational values (cultural capital), and invest

[7] Detailed information is available from the authors upon request.

themselves in career paths (identity capital). Second, our results contribute to the discussion in the HE literature on the measurement of student subjective and objective career success [Jackson and Bridgstock (2018), Inceoglu et al. (2019)]. We provide evidence in favour of subjective benefits (career fit) rather than objective benefits (permanent or full-time employment) from professional year placements.

As explained in section 2.2, the estimation of the potential effect of professional year placements on graduate outcomes suffers from self-selection, which is a common issue in impact evaluation of a programme on a set of outcomes [Gertler et al. (2016)]. This study employs propensity score matching to more accurately estimate the impact of professional year placement participation on a set of graduate outcomes, and, to the best of our knowledge, it is the first study to do so. Because matching methods use observed characteristics to construct a comparison group, if there are any unobserved characteristics that influence participation in the programme and also influence the outcomes, the impact estimation will be biased [Gertler et al. (2016)]. While we control for an extensive set of covariates, we cannot rule out the possibility that there are characteristics we did not account for (as this information is not available either from the graduate survey or the University) that may affect both programme participation and outcomes. For example, St Clair-Thompson and Chivers (2019) shows that psychology students who intend to go on placement are more conscientious and autonomous, two characteristics that we have not controlled for, and might be relevant for economics students too. Furthermore, conscientiousness is associated with more careful consideration of career choices [St Clair-Thompson and Chivers (2019)]. This association is corroborated by our results that show placement graduates are more likely to have a job that fits their career plans. Carefully designed surveys that can identify such characteristics, or motivations for engagement in professional year placements, and that also track placement and non-placement students from the beginning of their degrees until they start a graduate job will help address more effectively the self-selection issue in this context.

Our last point of discussion relates to possible differences in graduate job quality due to gender. Our results are consistent with other findings showing that differences in labour market outcomes between men and woman are small [Chevalier (2002), Einarsdóttir (2002)] or non-existent upon entry to the labour market [Manning and Swaffield (2008)], but men earn more than women after some years of work experience [Chevalier (2011); Francesconi and Parey (2018)]. Our study contributes to the literature on gender inequalities in the

labour market, by looking at early stages of career development, where opportunities for professional progression, such as salary negotiations or promotions, and family-related decisions are less likely to contribute to differences in job quality for male and female workers.

5 Conclusion

The objective of this study was to examine the effect of professional year placement on a set of graduate job-quality indicators that cover earnings, job security and career fit. We uncovered a positive effect on career fit, but there was no conclusive evidence of a positive effect on earnings, and no evidence of an effect on job security. Furthermore, our findings showed that the location and industry of the graduate job, and graduates' school background matter for job quality, but, notably, this is not true for gender.

There are certain limitations that need to be acknowledged. First, our sample represents a single department and university in the UK, thus our findings are not necessarily representative of the entire higher education sector in the country. However, researchers in this field face a trade-off: either use data from graduate outcomes surveys that cover a wider set of HEIs, or focus on a specific department or institution by combining graduate surveys with university administrative records, where additional individual-level data (e.g. students' characteristics) are available and necessary to establish causality. We followed the latter approach. Second, although we control for a wide range of factors that may determine graduate job quality, others that are not available from those data sets, like graduates' personality traits and soft skills, may also affect job quality. For instance, if placement graduates are more motivated than non-placement graduates then it is likely that the former would have found better graduate jobs. In this case, our results would overestimate the positive effect of professional year placement on job quality.

Consequently, further research in this area is required. As argued in the previous section, surveys can be helpful to elicit information on students' personalities and motivations before and after their participation in a professional year placement programme. Additionally, while the literature on the effects of placements on graduate outcomes has grown substantially, there is a lack of research on how such effects materialise. For example, graduates may benefit from the development of their social capital while on placement and this can contribute to their future employability [Inceoglu et al. (2019)]. Such mechanisms need to be examined if we are to gain a better understanding of the link between placements

and employability.

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References

Advance HE. 2020. "Essential frameworks for enhancing student success: embedding employability."

Arsenis, P., and M. Flores. 2019. "Student academic performance and professional training year." *International Review of Economics Education*, 30.

Bridgstock, R., and D. Jackson. 2019. "Strategic Institutional Approaches to Graduate Employability: Navigating Meanings, Measurements and What Really Matters." *Journal of Higher Education Policy and Management*, 41(5): 468–84.

Brooks, R., and P. L. Youngson. 2016. "Undergraduate professional year placements: an analysis of the effects on career progression." *Studies in Higher Education*, 41(9): 1563-1578.

Caliendo, M., and S. Kopeinig. 2008. "Some practical guidance for the implementation of propensity score matching." *Journal of Economic Surveys*, 22(1): 31-72.

Chevalier, A. 2002. "Education, Motivation and Pay of UK Graduates: are they different from women?" *European Journal of Education*, 37(4): 347-369.

Chevalier, A. 2011. "Subject choice and earnings of UK graduates." *Economics of Education Review*, 30:1187-1201.

Department for Business Innovation & Skills. 2015. "Graduate Recruitment and Selection Evidence Report." BIS Research Paper No. 231.

Einarsdóttir, T. 2002. "European Graduates: cross-country diversity and gender disparity." *European Journal of Education*, 37(4): 333-346.

Francesconi, M., and M. Parey. 2018. "Early gender gaps among university graduates." *European Economic Review*, 109: 63-82.

Garrido, M. M., Kelley, A. S., Paris, J., Roza, D. E. M., Morrison, R. S., and M. D. Aldridge. 2014. "Methods for Constructing and Assessing Propensity Scores." *Health Services Research*, 49(5): 1701-20.

Gertler, P. J., Martinez, S., Premand, P., Rawlings, L. B., and C. M. J. Vermeersch. 2016. "Impact Evaluation in Practice" (2nd Edition) The World Bank.

Greene, W.H. 2008. "Econometric Analysis" (6th Edition) Pearson Prentice Hall.

Healy, M., Brown, J.L., and C. Ho. 2022. "Graduate employability as a professional proto-jurisdiction in higher education." *Higher Education*, 83: 1125-1142.

Healy, M., Hammer, S., and P. McIlveen. 2022. "Mapping graduate employability and career development in higher education research: A citation network analysis." *Studies in Higher Education*, 47(4): 799–811.

Heckman, J. 1979. "Sample selection bias as a specification error." *Econometrica*, 47(1): 153-161.

Higher Education Statistics Agency. 2020. "Reflecting on Graduate Outcomes survey response rates in unpredictable times." Available at: https://www.hesa.ac.uk/blog/16-12-2020/graduate-outcomes-response-rates.

Holmes, L. 2015. "Becoming a graduate: the warranting of an emergent identity." *Education + Training*, 57(2): 219-238.

Inceoglu, I., Selenko, E., McDowall, A., and S. Schlachter. 2019. "(How) Do work placement work? Scrutinizing the quantitative evidence for a theory-driven future research agenda." *Journal of Vocational Behavior*, 110(B): 317-337.

Jackson, D. 2016. "Re-conceptualising graduate employability: the importance of pre-professional identity." *Higher Education Research & Development*, 35(5): 925-939.

Jackson, D. 2018. "Developing graduate career readiness in Australia: shifting from extra-curricular internships to work-integrated learning." *International Journal of Work-Integrated Learning*, 19(1): 23-35.

Jackson, D. and R. Bridgstock. 2018. "Evidencing student success in the contemporary world-of-work: renewing our thinking." *Higher Education Research & Development*, 37(5): 984-998.

Jones, C. M., J. P. Greenb and H. E. Higson. 2015. "Do work placements improve final year academic performance or do high-calibre students choose to do work placements?" *Studies in Higher Education*, 42(6): 976-992.

Manning, A., and J. Swaffield. 2008. "The Gender Gap in Early-Career Wage Growth." *The Economic Journal*, 118: 983-1024.

Margaryan, S., Saniter, N., Schumann, M., and T. Siedler. 2019. "Do Internships Pay Off? The Effects of Student Internships on Earnings." *IZA DP No. 12478*

McGuinness, S., Whelan, A., and A. Bergin. 2016. "Is There a Role for Higher Education Institutions in Improving the Quality of First Employment?" *B.E. Journal of Economic Analysis and Policy*, 16(4): 12-23.

Mincer, J. 1974. "Schooling, experience, and earnings". NBER.

Moores, E., and P. Reddy. 2012. "No regrets? Measuring the career benefits of a psychology placement year." *Assessment & Evaluation in Higher Education*, 37(5): 535-554.

Sin, C., and G. Neave. 2016. "Employability Deconstructed: Perceptions of Bologna Stakeholders." *Studies in Higher Education*, 41 (8): 1-16.

Smith, S., E. Taylor-Smith, C. F. Smith, and G. Webster. 2018. "The Impact of Work Placement on Graduate Employment in Computing: Outcomes from a UK-Based Study." *International Journal of Work-Integrated Learning*, 19(4): 359-369.

St Clair-Thompson, H., and C. Chivers. 2019. "Characteristics of students who consider taking a psychology placement year." *Studies in Higher Education*, 44(11): 1889-1899.

Succi, C., and M. Canovi. 2020. "Soft skills to enhance graduate employability: comparing students and employers' perceptions." *Studies in Higher Education*, 45(9): 1834-1847.

The Economics Network. 2019. "Survey of Employers of Economics Graduates." The Economics Network. Available at https://www.economicsnetwork.ac.uk/projects/surveys/employers2019#Full_report.

Tomlinson, M. 2012. "Graduate employability: A review of conceptual and empirical themes." *Higher Education Policy*, 25(4): 407–431.

Tomlinson, M., H. McCafferty, A. Port, N. Maguire, A. E. Zabelski, A. Butnaru, M. Charles, and S. Kirby. 2022. "Developing graduate employability for a challenging labour market: the validation of the graduate capital scale." *Journal of Applied Research in Higher Education*, 14(3): 1193-1209.

Wilton, N. 2012. "The impact of work placements on skills development and career outcomes for business and management graduates." *Studies in Higher Education*, 37(5): 603-620.

Appendix

Propensity score matching

In this section we show how we carried out the propensity score analysis in five steps, following the relevant literature, especially Garrido et al. (2014), Gertler et al. (2016), and Caliendo and Kopeinig (2008). Below we describe the steps taken to estimate the ATE and the ATET for earnings. We followed the same process for the other graduate outcomes.

Step one. Selection of variables to include in the propensity score. We proceed by considering those variables that should be included and those that should not be included.

(A) We include the variables that may affect both the decision to participate in the PTY and the outcome variable (i.e. real earnings). The logit model for PTY included first and second-year mark, age, gender, fee status, ethnicity dummies, and school type dummies. The statistically significant variables are: second-year mark (at 1%), gender (at 5%), age (at 1%), and ethnic (Asian/Other) (at 5%).

(B) We consider the variables that are thought to be related to the outcome but not to the participation in the programme (or treatment). The logit model for PTY included job location, industry type dummies, and the cohort dummy for 2017-18. All these variables are not statistically significant. Thus, these variables do not affect treatment. The linear regression for real earnings included job location, industry type dummies, and the cohort dummy for 2017-18. The statistically significant variables are: job location (at 5%), industry (Prof/Account) (at 1%), industry (Other) (at 1%), and the cohort 2017-18 (at 1%). Thus, these statistically significant variables are related to the outcome.

(C) Variables that are affected by treatment should not be included. In addition to the results from the logit model in (B) above, we estimated a logit model for each after-treatment variable and the programme participation dummy. The PTY dummy has no explanatory power on job location, industry type dummies and cohort 2017-18. However, we find that final-year mark is associated with PTY. Specifically, participating in the PTY has a positive effect on final-year mark, which is consistent with the literature [e.g. Jones et al. (2015)]. Because the degree mark is highly correlated

with final-year mark, PTY has also a positive effect on the degree mark. Therefore, final-year mark and degree mark are excluded from the computation of the propensity score.

Consequently, the variables included in the computation of the propensity score are: second-year mark, gender, age, ethnic (Asian/Other), job location, industry (Prof/Account), industry (Other), and cohort 2017-18. That is, a total of eight confounding variables.

Step two. The propensity score should be similarly distributed across treated and untreated groups, that is, the propensity score should be 'balanced' between the two groups. This can be examined by splitting the propensity score distribution into quintiles. Similarly, the 'balance' of covariates between the two groups within blocks of the propensity score is examined. We find that the balancing property is satisfied.

Step three. Choice of matching and weighting estimator. We considered five matching and weighting estimators: nearest neighbour one-to-one (NN-1-to-1), nearest neighbour within caliper (NN-caliper), Kernel, inverse probability of treatment weights (IPTW) and IPTW double robust. We assess Kernel, NN-1-to-1 and NN-caliper according to the mean/median bias, Rubin's B, Rubin's R, and the percentage bias for each covariate. Table 3 shows that Kernel achieved the highest quality of matching. It achieves the lowest mean/median bias and Rubin's B, Rubin's R falls within the acceptance range [0.5-0-2], and all individual covariates fall within a percentage bias of less than 20.3%. Moreover, we estimated the IPTW and IPTW (double robust) which showed no statistically significant differences in the standardised mean differences across treated and control groups. Despite showing similar results to the Kernel, the IPTW did not pass the overidentification test for the ATET. Therefore, the most reliable matching method is Kernel matching.

Step four. Estimation of the ATE and the ATET using kernel matching.

Step five. The last step of this process involves running diagnostics after using Kernel matching. The densities of the propensity scores for the treated and untreated individuals were plotted and compared. The results show that they are very similar, meaning that once again balance is achieved.

Table 3: Diagnostics of matching estimators

Diagnostic	Kernel	NN-1-to-1	NN-caliper
Mean Bias	6.1	7.4	14
Median Bias	3.1	4.3	14
Rubin's B	27.7	33.3	50.7
Rubin's R	1.01	0.84	1.22
Number of covariates with a percentage bias of $< 10\%$	6	6	4
Highest percentage bias of individual covariates	20.30%	20.20%	28.00%

Table 4: Sample and groups characteristics

Variable	Sample	Placement					Non-Placement				
	Mean	Obs	Mean	Std. Dev.	Min	Max	Obs	Mean	Std. Dev.	Min	Max
real wage	29,288	129	30,023	6,630	14,479	57,915	67	27,874	8,968	8,687	62,741
permanent employment	0.71	173	0.77	0.42	0	1	124	0.62	0.49	0	1
full-time employment	0.60	203	0.69	0.46	0	1	183	0.49	0.50	0	1
career fit	0.42	131	0.50	0.50	0	1	93	0.30	0.46	0	1
gender	0.70	263	0.69	0.46	0	1	293	0.71	0.45	0	1
age	18.39	263	18.28	0.80	17	27	292	18.50	1.07	17	28
fee status	0.73	263	0.88	0.33	0	1	293	0.60	0.49	0	1
ethnic (White)	0.59	239	0.69	0.47	0	1	213	0.48	0.50	0	1
ethnic (Asian/Other)	0.41	240	0.31	0.46	0	1	213	0.52	0.50	0	1
school (Acad./Compr.)	0.62	230	0.62	0.49	0	1	184	0.63	0.48	0	1
school (Grammar/Indep.)	0.15	230	0.15	0.36	0	1	184	0.16	0.37	0	1
school (Sixth form/Tertiary)	0.22	230	0.23	0.42	0	1	184	0.21	0.41	0	1
first-year mark	69.25	262	70.71	7.06	51	88	293	67.93	9.45	45.75	87
second-year mark	67.24	262	69.67	8.30	48.25	90.13	292	65.06	9.84	33.25	88.38
final-year mark	68.98	263	72.03	6.79	49.13	86	292	66.24	9.77	35.94	89.63
overall mark	68.49	263	71.23	6.56	50.53	85.96	292	66.02	8.93	46.13	89.19
programme (E)	0.46	263	0.46	0.50	0	1	293	0.46	0.50	0	1
programme (EF)	0.40	255	0.42	0.49	0	1	259	0.39	0.49	0	1
programme (BE)	0.07	255	0.09	0.28	0	1	259	0.06	0.23	0	1
programme (EM)	0.08	255	0.05	0.22	0	1	259	0.11	0.32	0	1
job location	0.69	164	0.71	0.45	0	1	107	0.65	0.48	0	1
industry (EFB)	0.30	169	0.33	0.47	0	1	118	0.26	0.44	0	1
industry (Prof/Account)	0.20	169	0.19	0.39	0	1	118	0.21	0.41	0	1
industry (Tech/Gov)	0.17	169	0.20	0.40	0	1	118	0.12	0.32	0	1
industry (Other)	0.37	169	0.31	0.47	0	1	118	0.46	0.50	0	1
cohort 2016/17	0.28	264	0.32	0.47	0	1	293	0.25	0.43	0	1
cohort 2017/18	0.42	263	0.44	0.50	0	1	293	0.40	0.49	0	1
cohort 2018/19	0.29	263	0.24	0.43	0	1	293	0.35	0.48	0	1

Table 5: Effect of PTY on earnings: OLS results

Control variables	M1	M2	M3
PTY	0.1017**	0.0779*	0.0652*
	(0.0436)	(0.0399)	(0.0350)
gender		-0.0192	-0.0009
		(0.0416)	(0.0321)
age		-0.0489	-0.0114
		(0.0479)	(0.0273)
fee status		0.1169	0.0936
		(0.1074)	(0.0875)
ethnic (Asian/Other)		0.0685*	0.0496
		(0.0395)	(0.0309)
school (Grammar/Independent)		-0.0324	-0.0571
		(0.0446)	(0.0391)
school (Sixth form/Tertiary)		-0.0652	-0.0833**
		(0.0422)	(0.0340)
second-year mark		-0.0023	-0.0036*
		(0.0027)	(0.0018)
job location			0.0750**
			(0.0303)
industry (Prof/Account)			-0.1451***
			(0.0373)
industry (Tech/Gov)			-0.0780**
			(0.0393)
industry (Other)			-0.1594***
			(0.0373)
cohort 2017/18			0.0899***
			(0.0286)
constant	10.1859***	11.1595***	10.4278***
	(0.0395)	(0.9600)	(0.5028)
Observations	196	171	167
F	5.44	2.39	6.19
p-value	0.0182	0.0661	0.0000
R^2	0.0352	0.2264	0.3065

Note: The table shows the regression coefficients and the robust standard errors in parenthesis. *, ** and *** denote significance at 10%, 5% and 1% level, respectively.

Table 6: Effect of PTY on job security and career fit: Logit results

Control \ Outcome	Permanent	Full-time	Career fit
PTY	0.4213	0.5075	0.7833**
	(0.3586)	(0.3700)	(0.3768)
gender	-0.5330	0.3096	0.1881
	(0.3739)	(0.3673)	(0.3510)
age	0.6826*	0.5956*	-0.5692
	(0.4007)	(0.3515)	(0.3562)
fee status	-0.1232	1.8654*	-0.6185
	(1.0620)	(1.0007)	(1.7569)
ethnic (Asian/Other)	-0.3983	-0.7751**	-0.3535
	(0.3470)	(0.3935)	(0.3577)
school (Grammar/Independent)	0.7459	1.9564**	-0.7092
	(0.5066)	(0.7819)	(0.4560)
school (Sixth form/Tertiary)	0.0930	0.0079	-0.1607
	(0.3982)	(0.4086)	(0.4028)
second-year mark	0.0012	-0.0174	-0.0131
	(0.0215)	(0.0207)	(0.0194)
job location	0.3649	0.0814	0.6157
	(0.3416)	(0.3998)	(0.3960)
industry (Prof/Account)	-0.6714	-1.5320***	-0.2271
	(0.4414)	(0.5463)	(0.4483)
industry (Tech/Gov)	0.4117	-0.0828	-0.0970
	(0.5670)	(0.6543)	(0.5342)
industry (Other)	-0.6760*	-1.1324**	-0.8764**
	(0.4068)	(0.4863)	(0.3996)
cohort 2017/18	0.3150	0.5822	-0.8377**
	(0.3315)	(0.3753)	(0.3781)
constant	-11.1502	-9.9258	11.4577*
	(7.7881)	(6.5028)	(6.8731)
Observations	237	237	185
p -value	0.0774	0.0172	0.0301

Note: The table shows the regression coefficients and the robust standard errors in parenthesis. *, ** and *** denote significance at 10%, 5% and 1% level, respectively.