Higher Education Widening Access Initiatives – An Estimation of Wage Returns from Scottish Articulation

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Abstract

We estimate the wage returns of undergraduates who attained their degree via Scotland's Further Education College (FEC) Articulation policy. We contribute to existing literature by adding to the research on varying returns based on paths to acquiring a degree, while also being the first paper to examine the returns associated with Scottish Articulation. While Articulation students receive a wage premium relative to college students, we find lower returns for Articulation students relative to those from older and higher-ranking university institutions in Scotland. This result questions whether improving educational equality, translates to improved income equality between low vs higher income backgrounds.

Keywords: Higher Education, Human Capital, Earnings, Widening Participation, Inequality

JEL Classification Codes: I2, I26, I28, J21, J24

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Introduction

Scotland, as with other developed nations, has seen a consistent increase in the number of students attending higher education. In addition to this increase, a series of policies have been implemented to ensure that opportunities to attend university are available to those who may have been unable to gain entry to university upon their first attempt to do so after leaving secondary education. Students who find themselves in such circumstances are more likely to come from lower income backgrounds or be the first in their family to attend university. An additional post-secondary education opportunity to gain access to university for such students is in part facilitated via the Scottish Government's Articulation policy. The policy that was instituted in 2003, allows for students attaining vocational qualifications (i.e. Higher National Certificate (HNC) or Higher National Diploma (HND)) at Further Education Colleges (FEC) to apply for direct entry, at either 2nd or 3rd year[2] to a series of Articulation partner universities throughout Scotland. Upon completion of the HNC/HND, students can go on to study for a Bachelors' degree by transferring from the FEC to university. This transfer of student's between FEC and universities is analogous to that seen in the US where students transfer between community/junior colleges to 4-year institutions. The Articulation policy is geared towards addressing two of the Scottish Government's key higher education objectives; namely widening access to higher education among lower income households and narrowing the attainment gap[3] between students from high and lower income households, and by virtue of this goal, lower income inequality between high and low income households. These two issues are central components of the Scottish Government's education policy supported by the government's Commission on Widening Access and underpinned by objectives contained within The Scottish Attainment Challenge. The Scottish Government have touted their ongoing success in these matters, highlighting Universities and Colleges Admissions Service (UCAS) statistics indicating that the proportion of students from low income backgrounds attending university has increased by 51% between 2006 and 2016 (SOMERVILLE, 2017).

While the policy supports the Scottish government's objective regarding the widening of access to higher education, limited research has sought to examine the post-graduation returns of students that have attained their degree via the Articulation route. While such research has been conducted in a US context (KANE and ROUSE, 1995; HILMER, 2000; LONG and KURLAENDER, 2009; GRIMES et al, 2013) based on the returns associated with transfer between 2 and 4-year institutions, research of this kind is far less common in UK given the relative rarity of this practice. The expansion of the FEC sector in Scotland and the implementation of government policies such as Articulation, closely align colleges and universities in a manner that is relatively unique in the UK, where Articulation agreements of this kind between universities and colleges are far less common. The establishment of such partnerships between FEC and HEI (Higher Education

[2] Undergraduate degree courses in Scotland normally last for 4 years
[3] The attainment gap is defined as the difference in educational attainment between individual's from high and low income households

Institution) allows for formal analysis of the potential outcomes associated with such state sponsored ventures. It is important to understand the wage returns associated with acquisition of a degree via this policy for several reasons, both individually and collectively from a societal or governmental perspective. Without a significant wage premium then from a purely pecuniary perspective one might rationally question the value of pursuing a degree after acquiring an HNC/HND. A secondary consideration is the comparative wages of articulating graduates relative to graduates who pursued a 'traditional' route to their degree via a 4-year institution. A disparity in returns in favour of 'traditional' graduates may weaken the justification for pursuing a degree via Articulation and may reflect a generally weak labour market signal associated with articulating graduates whereby the wage differential reflects the market placing a higher value on 'traditional' route graduates. Arguably more important than individual matters of interest are those at a macroeconomic level. The findings of this paper may raise questions about the potential returns that the Scottish government can hope to experience from the investment they have made into this policy. Given the findings, it may be appropriate to question whether it would be wise to continue with the expansion of the Articulation scheme as the government currently plans to do so at a cost in excess of £3 million per annum. Addressing this point would seem especially pertinent given the recent cut in funding by the Scottish Funding Council (SFC) of £30 million, all the while maintaining the Articulation budget, and championing the scheme as a success.

This paper is structured as follows: firstly, we present a description of the structure of the higher and further education sectors within Scotland. This is followed by a discussion of related literature touching on both the array of returns to education literature based on UK qualifications, and literature, which has sought to estimate the effects of transferring from the equivalent of a FEC to a university. The methodology is then presented including a full discussion of the data and the econometric method applied in the analysis. Results from the empirical estimates are then presented. This is followed by a discussion of the results, implications and concluding remarks.

Background

As secondary school students in Scotland approach the final two years of their secondary school education[4], they complete a series of national examinations where the resulting grades are used in the application process to gain access to post-secondary education. Post-secondary education in Scotland is separated into two distinct categories. The larger of the two sectors is that of HEI's. This sector includes 19 universities ranging from the so-called 'ancient' Russell Group institutions such as Glasgow and Edinburgh, Pre-1992 established institutes such as Dundee and Strathclyde, and modern universities such as Glasgow Caledonian and the University of West Scotland. Also included are a series of arts and specialist institutions such as Glasgow Art School, The

[4] Scottish secondary school students complete between four to six years of secondary education, in large part depending on their post-secondary education aspirations and whether or not they wish to study at a HEI or FEC after leaving secondary school.

Royal Conservatoire and the Scottish Rural College. All institutions hold degree-granting powers ranging from the conferment of undergraduate qualifications to masters and doctorates. The FEC sector is comprised of over 15 colleges specialising in vocational and lower level academic qualifications, commonly used for entry at first year or via advanced entry transfer to HEI's. Attendance at either a HEI or FEC is free at the point of use to all Scottish and EU applicants, with some exceptions based on prior education. Students from the rest of UK are subject to tuition fees, at the same rate charged in England and Wales. Consistently, over 55% of school leavers attend either HEI or FEC. A full summary of the destination statistics collected by the Higher Education Statistics Agency (HESA) are included in Table 1.

Table 1
Distribution of Scottish School Leavers

Destination Category	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16
Higher Education	34.2%	34.4%	36.1%	36.9%	38.2%	36.8%	37.3%
Further Education	24.3%	24.6%	24.8%	24.5%	24.3%	23.4%	22.4%
Total Number of School Leavers	52,953	53,255	49,610	51,515	51,293	52,337	52,113

As evidenced by Table 1, attendance at a HEI is the most popular destination for school leavers in Scotland. This route requires that students attain an acceptable standard[5] in their national examinations to gain admission. The examinations, referred to as Scottish Highers and A-Levels are completed in student's 5th and 6th year in secondary school. For those who fail to attain the minimum standard for their preferred university course, FEC's represent the most popular alternative to HEI's for those who wish to continue their education. Students who attend a FEC are not required to complete a 5th or 6th year at secondary school. Some students who attend FEC's have decided to do so by ending their secondary school education after only 4 years, and therefore do not complete the examinations (Highers or A-Levels) that allow a student to apply for entry to university immediately after leaving secondary school.

As previously mentioned, the Articulation scheme was developed to provide a means of allowing students from FEC's to transfer to HEI's in pursuit of higher-level qualifications. The scheme is only open to Scottish domiciled students who have attended a participating FEC. Not all institutions participate in the scheme, as university involvement is effectively limited to Scotland's modern universities, also known as Post-1992 institutions as they were formed after 1992. The scheme is largely rejected by older, more established universities, comprising of Russell Group or Pre-1992 institutions. This could be for several reasons: In part it may be likely due to the excess demand they currently have for places, the lack of financial

[5] Minimum entry standards vary significantly across institutions and degree disciplines and can range from a grade profile in five national examined subjects ranging from BBCCC for courses/universities with lower requirements, to a profile of AAAAA with the requirement for further study in secondary school for the most selective universities and demanding subjects such as Medicine and Law.

incentive given their assumed stronger financial position compared to younger universities, and the need to maintain academic standards. Academic performance concerns are borne out of the possibility that transfers from FEC's may be unable to maintain a high level of performance in a more demanding academic environment. Universities not involved in the Articulation scheme in some instances have other agreements in place with FEC's, which fall outside the strict remit of Articulation, which requires advanced entry at 2nd or 3rd year level. The individual agreements between universities and FEC's allow universities to maintain a greater degree of control regarding the transfer process allowing them to dictate the entry level which college students may transfer to. Furthermore, not all colleges participate as part of the Articulation scheme, as some are excluded on the basis that they act as both a HEI and FEC. This includes the aforementioned specialist schools as well as The University of Highlands and Islands, which grants both college and university level qualifications, and is therefore not eligible. A full summary of participating colleges and universities are listed below in Table 2.

Table 2
Articulation Colleges and Universities in Scotland

Articulation Colleges	Articulation Universities
Ayrshire College	Abertay University
City of Glasgow College	Edinburgh Napier University
Dumfries and Galloway College	Glasgow Caledonian University
Dundee and Angus College	Open University Scotland
Edinburgh College	Queen Margaret University
Fife College	Robert Gordon University
Forth Valley College	University of West Scotland
Glasgow Clyde College	
Glasgow Kelvin College	
New College Lanarkshire	
North East Scotland College	
South Lanarkshire College	
West College Scotland	
West Lothian College	

As a final point, it should be noted that the concept of Articulation itself is not unique to Scotland. Articulation agreements exist between colleges and universities in England. The distinction associated with Scotland's articulating policy is that it is publicly funded, where as any scheme analogous to Articulation in the rest of the UK is privately financed by the student.

Previous Work

In examining, the literature related to this topic there are several areas over which this paper is related beyond simply the empirical estimation of wage returns to qualifications. While this is of importance, the topic also

touches on literature associated with transferring from vocational to academic institutions and the impact this has on academic performance as well as post-education outcomes.

The prevailing assumption associated with human capital theory is that individuals make optimising decisions regarding the acquisition of human capital in the form of education and/or training to increase their future earnings' potential (BECKER, 1962). This statement continues to resonate today as the primary motivations for attending higher education fixate on two main factors, namely wages and employability (DAVIES et al, 2013). High levels of education and the positive traits that may be inferred from achieving such, also act as a signal to the labour market about the marginal productivity of an individual relative to others with lesser or comparative levels of human capital. The signal, based on the association between productivity, intelligence, skills and other characteristics associated with a degree, may indicate the extent to which a perspective employee is more or less qualified when compared with other potential candidates (SPENCE, 1973).

A considerable volume of literature at UK level has sought to estimate the returns associated with different qualifications (BLUNDELL et al, 1997; ROBINSON, 1997, DEARDEN et al, 2002). Literature of this kind covers all forms of qualifications from the earliest lower higher school level to postgraduate qualifications at a masters and doctorate level. The literature broadly shows the highest returns for higher level qualifications with qualifications at degree level and above holding a graduate wage premium relative to not only those without qualifications, but also those with lower level qualifications such as vocational qualifications. These findings are echoed in more recent UK based studies such as BRUNELLO AND ROCCO (2017), who find that vocational qualifications underperform relative to academic qualifications. A segment of the literature has focused on the analysis of the comparative returns associated with vocational qualifications. Most recently, MCINTOSH AND MORRIS (2016) analysis of the wage returns associated with vocational qualifications in the UK find substantial variations across the different types of qualifications depending on the level attained and the subject studied, with the highest premium attached to HNC/HND qualifications. To this point, a very limited portion of the literature has sought to estimate the effects on labour market outcomes of the interaction of different qualifications. The majority of aforementioned literature focuses on the highest qualification attained without examining an individual's education background prior to that point. An exception would be GASTEEN and HOUSTON (2007) who develop a model to examine the differing routes, which individuals take in acquiring further education and the impact specific routes have on their wage premia. Conventional thought may be that most individuals acquire the requisite level of education at secondary school before continuing their education at university in the hope of attaining their undergraduate degree[6]. With alternative approaches to education, the removal of educational barriers and a shift towards cooperation between FEC's and HEI's, we can observe a proportion of society following alternative routes in their educational development. Gasteen and Houston confirm that those taking the 'traditional' route to higher

[6] Hereafter referred to as the 'traditional' or 4-year route to higher education, directly from secondary school to university.

education experience greater returns to education than those following a non-traditional route via further education colleges or some institutionally defined recognition of prior learning. Their analysis closely aligns with that presented hereafter but differs in that the returns are estimated relative to those with no qualifications, do not control for institution, degree subject or classification and were estimated in the infancy of the implementation of the Articulation policy.

As a precursor to estimating the wage returns associated with Articulation, it is necessary to consider if this process of transferring credits between institutions has previously been shown to display any effect on academic performance or post-education outcomes. Most of the literature in this area approaches the topic from a US context, examining the transfer of students from 2-year community or junior colleges to 4-year institutions. The nature of this move, while not identical, is analogous to the movement between a FEC and a HEI. Using a sample of economic students GRIMES et al, (2013) find that community college students transferring to 4-year institutions generally underperform in terms of GPA relative to 4-year students. Their findings also inform the development of a grade equivalency model indicating that 2 and 4-year institution grades are not equivalent to each other, and as such the notion that community/junior college does not adequately prepare students for undergraduate studies. LONG and KURLAENDER (2009) find that community college transfers are less likely to complete their degree than those who started their degree at a 4-year institution. In the context of Articulation, these findings can be viewed as confirmation of the concerns of the more established Scottish institutions who do not participate in the Articulation scheme, in part due to student performance issues. In terms of post-graduation performance, HILMER (2000) examines the returns experienced by transfer students and direct attendees given the quality of their institution. Hilmer finds a large positive wage return for university and community college students from the highest ranked institutions but an insignificant effect for all others. One might consider this as potentially providing support for policies such as Articulation. We would caution against this conclusion given that the universities that take in Articulating or students tend to be lower ranked, therefore the positive wage effects of transferring to a high-ranking institution are not attainable if such institutions do not participate

The ability of students in the UK, and more specifically Scotland, to transfer credits between FEC's and universities in part contributes to the government's overarching goal of widening access to higher education. The need to implement such policies is in response to findings revealing that the expansion in higher education that has so far occurred in the UK has not been evenly distributed across income brackets with those from higher income households disproportionately benefitting more than those from low income households (BLANDEN and MACHIN, 2004; MACHIN and VINGOLES 2004). The role of socioeconomic status is also highlighted in similar studies (GAYLE ET AL, 2002; BLANDEN and GREGG, 2004) More recent research by CHOWDRY ET AL (2013) indicates that secondary school performance plays a more significant role in determining the likelihood of higher education participation than one's place on the socioeconomic

ladder. The Articulation scheme sets out to address both issues. As the scheme is open to those at FEC's it is inherently targeting those students who may have failed to attain the standard required for entry standards for university upon leaving secondary school. FEC student intake is also disproportionately derived from students coming from a lower income background.

Methodology

Data

The UK's Quarterly Labour Force Survey (QLFS), 1992-2018: SN 6727 (2018) covering the period January 2012 to December 2018 is used. The data are in the form of a pooled-cross section. While the same respondents could possibly be surveyed multiple times across the duration of the data set, there is no means to track or monitor these individuals over time. There are some general inherent restrictions associated with the LFS. While the self-employed are included within the data, they fail to report a wage, and as such are not included within the wage model. The LFS is somewhat limited when addressing matters of endogeneity, in particular ability bias. This matter was raised by MCINTOSH and MORRIS (2016, op-cit) in their assessment of vocational qualifications using LFS data. They highlight that in the absence of suitable means of controlling for endogeneity, that researchers apply the approach of ensuring common characteristics between treatment and control groups as a means to produce the most reliable estimates possible. They highlight the consistency of this approach across other literature that has used the LFS (DEARDEN ET AL, 2002 op-cit; DEARDEN ET AL, 2004; DICKERSON and VIGNOLES, 2007; JENKINS ET AL, 2007). Although we make efforts control for ability within our estimations[7], we are, to an extent, comfortable with any remaining variation in coefficients potentially arising from ability bias. Such evidence would support the hypothesis that the acquisition of the same qualification while closing the attainment gap between high and low income households, may not close the income disparity between such households. Additional amendments and exclusions from the data are subject to the nature of the Articulation variable as outlined in the following section. Descriptive statistics are presented below in table 3.

[7] Inclusion of degree classification and institution within our estimates

Table 3 Descriptive Statistics			
Name	**Observations**	**Mean**	**St Dev**
Real Log Hourly Wage	2475	2.503592	0.473
Age	2475	37.6	10.97
Age^2	2475	1537.482	868.6511
Name	**Frequency**	**Percentage**	
Undergraduate Degree	729	29.5%	
Articulation	89	3.6%	
FEC Graduate	1657	66.9%	
Male	1128	45.6%	
Public Sector	859	34.7%	
Tenure Less Than 1 Year	551	22.3%	
Tenure 1 to 5 Years	987	39.9%	
Tenure Greater than 5 Years	937	37.9%	
Undergraduate First or Upper Second	318	12.8%	
Undergraduate - Other Classifications	411	16.6%	
Articulation First or Upper Second	44	1.8%	
Articulation - Other Classifications	45	1.8%	
Undergraduate Business	224	9.1%	
Articulation Business	37	1.5%	
Undergraduate Science	302	12.2%	
Articulation Science	28	1.1%	
Undergraduate Engineering	203	8.2%	
Articulation Engineering	24	1.0%	
Russell Group Institution Undergraduate	97	3.9%	
Pre 1992 Institution Undergraduate	264	10.7%	
Post 1992 Institution Undergraduate	368	14.9%	
Post 1992 Institution Articulation	89	3.6%	
2012	70	2.8%	
2013	476	19.2%	
2014	476	19.2%	
2015	431	17.4%	
2016	405	16.4%	
2017	441	17.8%	
2018	176	7.1%	

Articulating students only represent 3.6% of the total sample. Their representation is quite low and this limits our ability to rigorously evaluate the effectiveness of the policy based on such a small sample size. Their low representation is a function of Articulation being a less common route to university, the policy remaining a relatively new option, combined with our analysis applying only to Scotland.

Defining the Articulation Variable

Respondents are only included in the data if they hold either an HNC or HND, an undergraduate degree or a combination of the two. This captures the sub-populations we wish to compare within the

estimates and separates observations into three distinct groups i.e. FEC graduates who did not attend university, 'traditional' route undergraduates and Articulation undergraduates. Articulation is not available across all degree disciplines, thus, those studying subjects[8] outside of Business, Engineering and Biological Sciences are dropped. Given that the policy was introduced in 2003, those who attained their qualification prior to 2003 were also dropped from the sample. The sample consists of observations from 2007 to 2018. Earlier data is not included, as it does not include a variable recording degree classification, which we include as an explanatory variable to control for ability. A final restriction is made to ensure that all observations attended Scottish universities. The universities are broken down into three categories: Russell Group, Pre-1992 and Post-1992. This allows us to estimate wage differences across universities, which is important given that Articulation only takes place at Post-1992 institutions. In this sense we can estimate both, the wages of all undergraduates, controlling for institution, relative to FEC graduates, but also the differences in the wages among all undergraduates, thereby evaluating the wage difference between Articulating graduates attending a Post-1992 institution, compared with 4-year undergraduates who attended either a Russell Group, Pre-1992 or Post-1992 institution.

Wage Rate Estimation

The wage model estimates the wage rate associated with the three distinct groups defined by their qualification:

(i) w_t is the wage rate of a 'traditional' graduate who is assumed to attend university after high school

(ii) w_a is the wage rate of an Articulating graduate

(iii) w_f is the wage rate of a further education college graduate

One might assume that given their collective higher level of qualifications, degree graduates, regardless of whether or not they are of the Articulation or 'traditional' variety, should hold a wage premium relative to those who stopped their formal education after attending a FEC. A secondary assumption may be that articulating students have a lower wage premium than those who have attended university straight from high school. This may be due to actual difference in ability/productivity or a negative signal associated with their educational history.

We therefore expect that $w_t > w_a > w_f$. To test this empirically, we estimate a version of the human capital wage model developed by Mincer (1974):

$$\ln(w_i) = \alpha + \rho D_i + \gamma X_i + \lambda_t + \varepsilon_i \qquad (1)$$

Where the (log) real hourly wage rate[9] (w_i) is a function of:

[8] Subjects were identified using the prospectuses of Articulation universities.

[9] $Real\ Log\ Hourly\ Wage = \left(\frac{Hourly\ Wage}{CPI}\right) \times 100$. The Log of the resulting figured is then calculated to give the Real Log Hourly Wage. The CPI figures were sourced from https://www.rateinflation.com/consumer-price-index/uk-historical-cpi/.

- the aforementioned series of qualifications dummies (D_i), with FEC graduates as the excluded category. Also included are a series of interacted terms for degree type ('traditional' or articulation) and classification, in addition to degree type and degree subject
- other relevant observed variables (X_i), Age and Age^2, job tenure, public/private sector job status and location variables
- time-based dummy variables (λ_t), where year effects were estimated relative to an excluded year of 2018.

The log specification of the dependent variable (an individual's real hourly rate of pay) allows for to be interpreted as the percentage change in an individual's wage rate based on their qualification and institution. It is common for research of this kind to estimate qualification returns relative to non-graduates. The wage premia experience by both degree and FEC graduates relative to non-graduates has been well established and repeating the process in the model presented would be redundant. Dropping all non-graduates and those without the expressed qualifications defined earlier allows one to empirically examine the specific relationship between the groups of qualified individuals one wishes to examine. Given the previously mentioned restrictions to the data, we were unable to control for other factors such as work type (Full time or part time) or occupation type due to insufficient sample sizes across the categories in each area[10]. Our sample therefore only consists of individuals who are employed full time and we acknowledge the limitation of our model with respect to our inability to control for occupation.

Results

Estimates presented in Table 4 reveal that 4-year and articulating graduates hold a premium relative to FEC graduates. This finding is consistent across all variations of the model. This is to an extent to be expected as the Articulating graduates have attained a higher level of education than FEC graduates and therefore should be expected to receive some premium for the higher level of education they have attained. This can also be interpreted as an indicator of success for the policy, in raising the wages of those who entered the scheme above FEC graduates. In the absence of the articulation scheme these individuals may not have found a suitable path to education to raise their wages. An additional trend is that the magnitude of the difference between 4-year university graduates and FEC graduates takes a consistent order that aligns with the perceived quality of the institution type[11]. This finding is also to be expected and possibly reflects the premium attached to the perceived or real gap in ability signalled by graduates depending on their institution.

[10] The issue of insufficient sample sizes after our initial restrictions to the data were exacerbated by a significant portion of individuals choosing not to report their occupation. This, combined with the UK Data Services regulations on not using observational categories below a specific threshold prevented the inclusion of occupation within our estimates.
[11] Russell Group > Pre-1992 >Post-1992

Further analysis is conducted in the form of point estimates. Point estimates involve taking the coefficients estimated in the model and determining whether the difference between two given coefficients are statistically different from each other. This process enables us to evaluate Articulating students not only against FEC graduates, but also against their fellow graduate peers, thereby assessing the extent to which the policy has closed the attainment gap. Point estimates presented in Table 5 indicate that Articulating graduates earn less than those attending Russell Group or Pre-1992 institutions. The returns to an Articulating degree are only comparable to that of a graduate who attended a Post-1992 institution. These institutions tend to be the lowest ranked in Scotland and includes the only institutions that take part in the Articulating scheme. In this sense, Articulating students attain comparable returns only with the Post-1992 students they study with. This finding is further confirmation of the point raised in the discussion of Table 4 as to the ordering of the wage premium based on the institution. As before the gap between Articulating and 4-year undergraduates is greatest where the real or perceived gap in ability, signalled by institution is at its most significant, and diminishes as the real or perceived gap in ability signalled by institution declines to a point of parity between Articulating and Post-1992 institution undergraduates. The parity attained with Post-1992 institution undergraduates can also be viewed as an indicator of success for the policy as it has not only raised Articulating graduates to wages above FEC graduates, but also in-line with a portion of traditional 4-year undergraduates.

Table 4
Wage Regression
Standard errors in parentheses * p<.05, ** p<.01, *** p<.001

	(1) Simple Wage Model	(2) Wage Model with Degree Subject	(3) Wage Model with Degree Subject and Classification
Russell Group Institution Undergraduate	0.368*** (0.0531)	0.320*** (0.0533)	0.311*** (0.0544)
Pre 1992 Institution Undergraduate	0.393*** (0.0265)	0.339*** (0.0321)	0.332*** (0.0328)
Post 1992 Institution Undergraduate	0.265*** (0.0234)	0.219*** (0.0282)	0.213*** (0.0296)
Post 1992 Institution Articulation	0.224*** (0.0405)	0.190*** (0.0474)	0.173*** (0.0525)
Age	0.0536*** (0.00566)	0.0535*** (0.00563)	0.0539*** (0.00565)
Age^2	-0.000533*** (0.0000713)	-0.000538*** (0.0000713)	-0.000538*** (0.0000715)
Male	0.221*** (0.0164)	0.202*** (0.0172)	0.203*** (0.0173)
Public Sector	0.00211 (0.0175)	0.0131 (0.0179)	0.0136 (0.0181)
Tenure Less Than 1 Year	-0.184*** (0.0259)	-0.184*** (0.0261)	-0.185*** (0.0260)
Tenure 1 to 5 Years	-0.136*** (0.0204)	-0.136*** (0.020)	-0.136*** (0.0203)
Tenure Greater Than 5 Years	0 (.)	0 (.)	0 (.)
Undergraduate Business		0.0367 (0.0388)	0.0338 (0.0394)
Undergraduate Engineering		0.128*** (0.0391)	0.127** (0.0397)
Undergraduate Science		0 (.)	0 (.)
Articulation Business		0.00517 (0.0793)	-0.01022 (0.0787)
Articulation Engineering		0.107 (0.101)	0.0946 (0.103)
Articulation Science		0 (.)	0 (.)
Undergraduate First and Upper Second			0.0179 (0.0316)
Undergraduate All Other Classifications			0 (.)
Articulation First and Upper Second			0.0809 (0.0827)
Articulation All Other Classifications			0 (.)
Diagnostics and Notes			
Year Effects Controlled	Yes	Yes	Yes
Constant	1.105*** (0.108)	1.240*** (0.109)	1.239*** (0.109)
R^2	.3121	.3156	.3155
N	2475	2475	2475

Note: The Undergraduate and Articulation variables are estimated relative to the FEC graduate variable (the omitted category)

Table 5 Point Estimates				
Variables	**Coefficient**	**S.E.**	**t**	**P>(t)**
Russell Group Institution Undergraduate – Post 1992 Institution Articulation	0.1398	0.0732	1.91	.050
Pre 1992 Institution Undergraduate – Post 1992 Institution Articulation	0.1604	0.0593	2.70	.007
Post 1992 Institution Undergraduate – Post 1992 Institution Articulation	0.0401	0.0577	0.70	.487

Discussion and Conclusions

This paper quantifies the wage returns to education of an initiative (Scottish Articulation) that seeks to widen access to university. We rely on the restricted-use Quarterly Labour Force Survey (QLFS), obtained through the ONS secure access program. Specifically, we explore the extent to which the route to acquiring a university degree impacts the wage returns experienced by graduates. We do so with the view to provide evidence to evaluate Scotland's Articulation policy. The policy aims to provide access to higher education to students who have underperformed in secondary school and who tend to come from either lower income households, and/or households in which they are the first in their family to attend university. The extent to which the policy could be deemed a success is in part based on the wage returns for Articulating graduates relative to FEC graduates who did not participate in the scheme, but also Articulating graduates wage returns relative to undergraduates who studied at university for 4 years.

Traditional' 4-year and Articulating graduates maintain a wage premium relative to FEC graduates. The premium appears greater for 4-year graduates and is ordered in a manner reflecting institutional quality with older more established universities (Russell Group and Pre-1992), holding a higher premium relative to new universities (Post-1992). Articulating is beneficial for students as the Articulating graduates hold a wage premium relative to the FEC graduates. In one sense the policy achieves its goal as the attainment gap will decline as Articulating students, who tend to come from lower-income households, attain their degree via the scheme, and attain a variation of the graduate wage premium. Without Articulation, these students may have ceased their education after college and be subject to the wage gap observed between FEC graduates and university graduates. It should be noted though that the premium attained by Articulating graduates is not the same when compared against all their graduate peers. The difference between Articulating graduates and those attending higher ranked Russell Group and Pre-1992 institutions is statistically significant and in favour of the Russell Group and Pre-1992 graduates. Articulating students only attain a comparative wage premium to that of those attending generally lower ranking, Post-1992 universities.

The finding that Articulating graduates attain a lower premium relative to Russell Group and Pre-1992 graduates may serve as a suitable critique for the policy, in that simply endowing Articulating graduates

with the same qualifications as other 4-year undergraduates will not yield the same returns as the market may value these individuals differently, possibly in part based on factors such as perceptions regarding institution quality or perceptions of graduate quality based on the route an individual has taken to gain their qualification. The potential negative signal expressed by taking part in Articulation in its current form is likely enhanced by the aversion of higher-ranking institutions from taking part in the policy, despite the financial incentives in place to do so.

The overall finding of the disparity between Articulating graduates and those from 4-year graduates at higher ranked institutions is in a sense partly consistent with those of HILMER (2000, op-cit), who found that when students transferred to higher ranked institutions, they experience greater wage returns, while attaining insignificant wage returns when transferring to low ranked universities. The Articulation policy has the potential to address the issues of educational and income inequality more seriously, if it can involve higher ranking institutions in the scheme. How exactly the government might further incentivise participation from Pre-1992 and Russell Group universities should be a matter for policy advisors to consider in order to fully realise the full potential Articulation has to offer.

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