

Skills
Development
Scotland



Scottish Funding Council
Comhairle Maoinachaidh na h-Alba

Education and Skills Impact Framework (ESIF)

University Provision Contextual Summary Report 2022



Scottish Government
Riaghaltas na h-Alba



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Purpose and Rationale

This publication aims to summarise and provide context to the results of the Education and Skills Impact Framework (ESIF), designed to provide an estimate of the impact of education and skills in Scotland.

Specialist economic and policy consultants **London Economics** were commissioned by the Scottish Government's Enterprise and Skills Strategic Board to analyse the Return on Investment (ROI) associated with post-16 education and training in Scotland. Using the Scottish Longitudinal Education Outcomes (LEO) data, they estimated the labour market outcomes associated with higher education (HE) qualifications, further education (FE) qualifications, and Modern Apprenticeships (MAs). Combining this labour market analysis with information on the associated costs to the individual, the Exchequer, and the employer (for MAs only), they estimated the Return on Investment to each qualification. The methodological approach was independently reviewed by independent, academic experts at the outset and during the project.

The full technical report produced by London Economics describes the methodology and findings in detail. To complement this, three summary contextual reports have been produced, covering Modern Apprenticeships, College and University qualifications. **This report focuses economic outcomes resulting from individuals whose highest qualification was earned at university.** Reading this report, we should bear in mind that universities exist, and students gain university qualifications, for many more reasons than just an economic return.

Purpose and Rationale

Background

The Education and Skills Impact Framework (ESIF) was conceived by the Enterprise and Skills Strategic Board in 2019 to develop a robust evidence base that could help inform investment in post-school education and skills to enable a skills system that maximises both the return to public investment and the benefits to individual learners and employers.

The key driver behind this was the lack of comprehensive, consistent evidence on impact and ROI in the post-compulsory education and skills system in Scotland, the response to which was highlighted in 2 key documents:

Scottish Government Enterprise and Skills Review (2017)

“This will be achieved through better collaboration on intelligence across the enterprise and skills agencies, helping to identify the most effective interventions to support productivity improvements – including improving the evidence base on return on investment.”

Scottish Government 15-24 Learner Journey Review (2018),

where the Scottish Government committed to improving the measurement of the return from investment in education and training.

“Taking all this work forward will require strong joint leadership and the right evidence base so that we act on evidence of outcomes and return on investment to ensure we continue to invest in the right qualifications and right types of learning.”

The ESIF programme of work was agreed by CEOs of Skills Development Scotland (SDS) and the Scottish Funding Council (SFC) in January 2019 and noted that:

“Producing impact measures is not a simple task. But it is important ... Generating up-to-date impact estimates on this investment would:

- **ensure that public sector investment in post-school education and skills investment in Scotland is informed by robust evidence of impact**
- **support individuals to make informed career choices**
- **inform employer investment and recruitment behaviour”**

To facilitate this, two complementary workstreams were developed within the ESIF programme: Economic Impact, and Social and Wellbeing Impact. This report focuses on the findings from the Economic Impact workstream.

Purpose and Rationale

About University Qualifications

The Education and Skills Impact Framework (ESIF) considers 3 pathways: college, university and Modern Apprenticeships. As stated earlier this report focuses on the provision of first degrees, postgraduate taught and postgraduate research qualifications at university. Key points of context regarding qualifications at university are below.

- **Learning descriptor:** A first degree is more commonly known as a bachelors or honours degree. This includes courses leading to qualified teacher status (QTS), registration with a professional body and integrated master's degrees. Postgraduate degrees are differentiated by learning method into taught and research-based qualifications. Qualifications at this level include master's degrees and doctorates.
- **Qualification range:** First degrees range from SCQF levels 9-11. Postgraduate degrees sit at SCQF levels 11 or 12.
- **Student numbers:** As of academic year 2020-21, there were 40,225 Scottish-domiciled first-degree entrants to Scottish universities. By comparison there were 20,770 Scottish-domiciled postgraduate taught entrants and 1,425 Scottish-domiciled post graduate research entrants in the same period.
- **Public funding:** Due to the nature of SFC funding for universities it is not possible to directly attribute funding to individual qualifications. Funding for qualifications has been estimated by taking a proportion of total capital, teaching and student support funding by full time equivalents. In academic year 2018-19 first degrees received an estimated £680m of funding. By comparison funding for postgraduate taught qualifications was estimated at £65m in 2018-19. Postgraduate research qualifications are funded on a different basis and as such estimates are not provided here.

Context

Student Characteristics

This section sets out the characteristics of students enrolled on qualifications considered in this analysis. Figures are provided for academic year 2020-21. This reporting period was impacted by the ongoing global COVID-19 pandemic which presented a unique and significant external shock to the further and higher education systems in Scotland.

The majority (61.3%) of the 40,225 Scottish domiciled first-degree entrants in 2020-21 were aged 21 or less. Postgraduate taught qualifications were evenly split between entrants aged 22-30 (47.8%) and 31+ (46.9%). Only 1,105 of the total 20,770 postgraduate taught entrants were aged 21 or less. Numbers for postgraduate research qualifications follow a pattern with 1,355 Scottish domiciled entrants aged 22+ and only 65 (4.5%) aged 21 or below. Table 1 contains Scottish-domiciled entrants in 2020-21 by qualification and age group.

In academic year 2020-21, 61.8% of Scottish domiciled entrants to first degree, postgraduate taught or postgraduate research courses were women. This figure is greatest for postgraduate taught courses at 65.6%, however women make up the majority of entrants to courses at each level.

In 2020-21 9.6% of Scottish domiciled entrants to courses at University were from Asian; Black, African or Caribbean; Mixed or multiple ethnic groups; or other ethnic groups. This figure is consistent across levels of study.

Individuals from the 20% most deprived areas of Scotland areas made up 16.9% of entrants to first degree programs in 2020-21. By comparison 25.4% of Scottish domiciled entrants came from the 20% least deprived areas.

Context

Table 1 - Scottish-domiciled entrants to courses at Scottish universities by age and qualification group. Academic year 2020-21

Age group	<=21	22-30	31+	Total
First degree	24,665	8,715	6,840	40,225
PGT	1,105	9,930	9,740	20,770
PGR	65	855	500	1,425
Total	25,835	19,505	17,080	62,420

Table 2 - Scottish-domiciled entrants to courses at Scottish universities by care-experience and qualification group. Academic year 2020-21

Care Experience (self-reported)	No Care-experienced	Care-experience	Total
First degree	39,695	530	40,225
PGT	20,685	90	20,770
PGR	1,410	10	1,425
Total	61,785	635	62,420

Table 3 - Scottish-domiciled entrants to courses at Scottish universities by disability status and qualification group. Academic year 2020-21

Disability Status	Disability	No known disability	Total
First degree	6,840	33,385	40,225
PGT	2,535	18,240	20,770
PGR	195	1,225	1,425
Total	9,570	52,850	62,420

Context

Table 4 - Scottish-domiciled entrants to courses at Scottish universities by ethnic group and qualification group. Academic year 2020-21

Ethnic group	First degree	PGT	PGR
Asian, Asian Scottish or Asian British	1,935	875	70
Black, African or Caribbean	710	485	40
Mixed or multiple ethnic group	835	370	35
Not known	2,295	1,310	115
Another ethnic group	375	210	30
White	34,075	17,525	1,130
Total	40,225	20,770	1,425

Table 5 - Scottish-domiciled entrants to courses at Scottish universities by sex and qualification group. Academic year 2020-21

Gender	First degree	PGT	PGR	Total
Male	15,835	7,070	670	23,580
Female	24,195	13,620	740	38,560
Other	195	80	10	285
Total	40,225	20,770	1,425	62,425

Table 6 - Scottish-domiciled entrants to courses at Scottish universities by SIMD quintile and qualification group. Academic year 2020-21

SIMD Quintile	Headcount	Proportion (%)
1	6,790	16.9 %
2	6,645	16.5 %
3	7,625	19.0 %
4	8,660	21.5 %
5	10,230	25.4 %
Missing/ Unknown	280	0.7 %
Total	40,225	100.0 %

Context

Social and Wellbeing Impacts

It is widely recognised that education will have benefits beyond earnings and employment. Such benefits may include improved health outcomes, greater social mobility, increased civic engagement and reduced crime (BIS, 2013). Other notable benefits from post-school education include greater job satisfaction, increased community engagement (DfE, 2019). These benefits are particularly important for lower-level qualifications where individuals may face multiple challenges and originate from more deprived backgrounds.

In order to more fully understand the non-economic benefits resulting from education, a social returns workstream investigated the relationship between education and wellbeing, a non-economic outcome associated with a wide range of other positive outcomes.

Research

Due to the impact of the COVID-19 pandemic, the social and wellbeing workstream focused on measuring individual wellbeing using already available datasets: the Annual Population Survey, the Apprentice Wellbeing Survey and the Graduate Outcomes Survey. Datasets were restricted to individuals who hold a Scottish school-level qualification, and a regression analysis carried out to identify marginal wellbeing returns across different learner groups and qualification types.

All findings are associations – it was not possible to determine if education itself caused improvements in wellbeing.

Findings

Analysis suggests that possessing any form of qualification is associated with reporting higher levels of personal wellbeing. Respondents with no qualifications at all consistently reported lower wellbeing than the Scottish average.

Overall, the findings suggest that there is a relationship between acquiring qualifications and individual wellbeing, however further work is needed to understand if the changes in wellbeing can be attributed to education.

Next Steps

Investigating non-economic impacts of education is at an early stage, however these initial findings are a first step in recognising education gives value beyond that captured in wages and employment status. The research to date provides the building blocks for possible future work to support decisions that take a wider definition of value into account.

Context

Short-term Outcomes and Average Earnings

This section summarises existing information on earnings and employment outcomes associated with the completion of qualifications at Scottish universities, from the individual perspective.

University Short-term Outcomes

15 months after completing their university studies, students are asked to complete the Graduate Outcomes Survey which then provides data on the destinations of graduates across the UK. Of Scottish domiciled first degree graduates in the 2019-20 graduating cohort:

- 82.4% were employed
- 7.9% engaged in further study
- 5.4% were looking for work
- A total of 90.3% achieved positive destinations.

Of Scottish domiciled postgraduate taught and research students in the 2019-20 graduating cohort:

- 88.8% and 87.3% respectively were in employment, respectively. Employment rates for both were higher than for first degrees
- Employment rates were both higher than for first degrees
- 3.1% and 3.0% were engaged in further study
- 4.1% and 3.0% were looking for work
- A total of 91.9% and 90.3% were in positive destinations.

Table 7 – Graduate outcomes for Scottish domiciled students who studied at Scottish institution by level of qualification, graduating cohort 2019-20

Activity	First Degree	Postgraduate (taught)	Postgraduate (research)
Employment	82.4%	88.8%	87.3%
Further Study	7.9%	3.1%	3.0%
Unemployment	5.4%	4.1%	3.0%
Other	4.3%	4.1%	5.5%

University Short-term Earnings Outcomes

The Scottish Government's Graduate Outcomes (LEO) statistics (2021) provide median earnings following completion of a first degree. Five years after graduating, the median earning of a UK domiciled graduate from a Scottish university was £28,500 for the 2012-13 graduating cohort. For men in this graduating cohort the median income was £29,900, £2,500 higher than for women who received a median income of £27,400. Earnings are highly variable by subject of study. Graduates with degrees in the medicine and dentistry subject group received a median salary of £49,600, whereas the median income for graduates with degrees in creative arts and design was £21,200.

Considerations

When interpreting the findings within this paper, it should be noted that this is not considered to be an economic impact assessment of the university or college sector or apprenticeship offer. Several points should be considered, which include but are not limited to:

- 1. Benefits of the Longitudinal Educational Outcomes data set (LEO)** - The LEO dataset presents a unique opportunity to analyse the long-term earnings, employment and welfare dependency of individuals who have undertaken post-school education and training. This is the first time that this data has been used in Scotland to measure impact and as such represents a considerable leap forward in our knowledge of the long-term outcomes of investment in education and skills.
- 2. Individuals included in the analysis** - The results refer to Scottish-domiciled learners who were working in the UK after qualification. Individuals working abroad are not included, as HMRC does not collect earnings and employment data for these individuals. HESA data shows around 3 per cent of Scottish university graduates are working outside the UK, and the figure is thought to be lower for college graduates and MA completers.
- 3. Prior attainment** - We currently do not have data on the prior school qualifications held by individuals. This lack of secondary school information implies that the ability bias for individuals that progressed from secondary school to university (or to MAs or higher qualifications at college) cannot be fully mitigated by controlling for any prior attainment scores in the econometric analysis (as a proxy of ability). As a result, the estimated returns may not estimate the true returns to qualification achievement, with the bias likely to overestimate impacts for those qualifications where prior academic ability is a key driver of enrolment and achievement.
- 4. Work experience** - The data does not contain details of prior work experience, nor any information on individuals' non-cognitive skills (meta skills), both of which are expected to impact earnings, employment, and welfare benefit dependency.

Considerations

5. **Reasons for non-completion** - The main control group used in the model is non-completers. Individuals may not complete their qualification for a variety of reasons: they may find the course too difficult; they may lose interest or leave due to other personal issues. An individual may not complete their qualification for a 'positive' reason, for example, because they have been offered a job elsewhere, or decide to pursue a different career. The reason for non-completion is not available for inclusion in the model, therefore the marginal impacts will reflect a variety of reasons for non-completion, both positive and negative. We also assume that non-completers drop out at the beginning of their studies in the ROI model.
6. **Older students** - LEO data on an individual's highest qualification is collected from 2003/04 for university and college students, and from 2008/09 for MAs and therefore only provides a partial record of education for older individuals. These individuals may have obtained their highest qualification prior to the LEO collection date, which could overestimate the impact of more recent qualifications..
7. **Causation versus correlation** - The labour market returns estimated should not be interpreted causally, but only as associations. In other words, while certain qualifications may be associated with higher marginal earnings and/or ROI we cannot say for sure that it is the qualification that is driving these higher earnings.
8. **Stepping-stone qualifications** - The model looks only at the impact of an individual's highest qualification, however lower-level qualifications obtained by the same individual may also impact on their employment and earnings. For example, an individual may have a degree as their highest qualification (SCQF 10) but may also hold an MA or HND, therefore we can't estimate the value that each 'stepping-stone' qualification adds to the overall learner journey. In the same way, the model only accounts for the costs of the highest level of qualification achieved.
9. **Economic conditions** - The Return on Investment (ROI) model used is sensitive to several key economic conditions including inflation. As such changes to prior trends, such as wage growth or employment may lead to returns differing from estimates. While the best available projections of inflation were used at the time, these do not reflect recent rises above the predicted trend.
10. **Aggregation of vocational courses** - University provision is grouped by broad qualification types, ensuring an approximately equal level of academic engagement is assumed. However, this ignores differences in subject of degree and intended learning outcomes between degrees at the same level. Results should be considered as reflecting an average result across provision at a broad level and do not provide insight into the outcomes for degrees of any particular subject.

Benefit to individuals

Introduction

The following section covers the difference in earnings, employment and benefit dependency related to completing a qualification at university. These are calculated by comparing the outcome for individuals who completed the qualification to a control group via regression analysis. In addition, control variables are used to account for differences in characteristics including academic year of completion, ethnic group, disability status, SIMD quintile and region of residence.

For first degree students the control group is students with similar characteristics who started but did not complete a first degree. Students completing postgraduate taught and postgraduate research qualifications are compared to first degree completers due to sample size limitations.

Benefit to individuals

Earnings

Table 8 presents the estimated earnings returns for each qualification, three years after completion (broken down by sex and age at completion), with respect to the control group. **Earnings returns are interpreted as the percentage difference in daily earnings of an individual in possession of a given qualification relative to the control group.** For example, the results suggest women with a first degree aged 21 or less earn 52.9% more than women with similar characteristics who started but did not complete a first degree.

Table 8 - Earnings returns to qualification by sex and age, 3 years post-completion

Qualification	Women			Men		
	<=21	22-30	31+	<=21	22-30	31+
Postgraduate Research (vs First Degree)	Unavailable*	21.2%	19.6%	Unavailable*	25.2%	20.7%
Postgraduate Taught (vs First Degree)	26.8%	14.3%	24.0%	14.9%	8.9%	18.9%
First Degree (vs non-completers)	52.9% <small>m</small>	32.4%	20.4%	45.4%	26.8%	15.3%

*Some results are unavailable due to small sample sizes.

Key findings:

- Three years after completion, earnings are higher for graduates than the control group for each qualification, sex and age group.
- Returns are generally greater for women than for men.
- The difference between graduates and the control group is generally greater in younger age groups. This may reflect the value of skills and experience that mature students already possess at the beginning of their studies.

Benefit to individuals

Employment

Table 9 presents the estimated employment returns for each qualification, three years after completion (broken down by sex and age at completion), with respect to the control group. **Employment returns refer to the percentage point difference in the proportion of the year that an individual with a given qualification spends in employment relative to a control group.** For example, the results suggest that women aged 21 or less with a first degree spent 3 percentage points more of the year in employment than women with similar characteristics who started but did not complete a first degree.

Table 9 - Employment returns to qualifications by age and sex, 3 years post-qualification

Qualification	Women			Men		
	<=21	22-30	31+	<=21	22-30	31+
Postgraduate Research (vs First Degree)	Unavailable*	-5.3	-3.9	Unavailable*	-3.8	Not sig.
Postgraduate Taught (vs First Degree)	5.0	2.5	1.4	3.3	2.3	3.5
First Degree (vs non-completers)	3.0	5.9	6.4	4.6	3.9	4.2

*Some results are unavailable due to small sample sizes. For others, the benefit received was not significantly different from the control group.

Key findings:

- Employment returns for graduates with first degrees or postgraduate taught qualifications are positive across the board.
- Unlike earnings, there are no clear trends for employment returns by age or sex.
- Employment returns for individuals completing postgraduate research qualifications are negative or non-significant. This may imply a smaller labour market for graduates with these qualifications and as such a greater degree of frictional unemployment as compared to first degree qualifiers.

Benefit to individuals

Welfare benefit dependency

Table 10 presents the estimated benefit dependency returns for each qualification, three years after completion (broken down by sex and age at completion), with respect to the control group. **Welfare dependency returns are interpreted as the percentage point difference in the likelihood receiving labour market benefits for an individual with a given qualification relative to a control group.** For example, the results suggest that women with a first degree aged 21 or less are 3.5 percentage points less likely to receive labour market benefits than women with similar characteristics who started but did not complete a first degree. In this case, a negative figure indicates a more favourable result.

Table 10 - Benefit dependency returns to qualifications by age and sex, 3 years post-completion

Qualification	Women			Men		
	<=21	22-30	31+	<=21	22-30	31+
Postgraduate Research (vs First Degree)	Unavailable*	-3.3	-2.4	Unavailable*	-3.8	-4.7
Postgraduate Taught (vs First Degree)	-1.2	-1.4	-0.9	-1.8	-2.5	-3.4
First Degree (vs non-completers)	-3.5	-6.3	-4.2	-3.9	-5.8	-3.9

*Some results are unavailable due to small sample sizes.

Key findings:

- All qualifications are associated with significant, positive reductions in benefit dependency.
- First-degree graduates are less likely to receive labour market benefits than individuals with similar characteristics who started but did not complete a first degree.
- Graduates with a postgraduate taught or research qualification are less likely to be in receipt of welfare benefits than graduates at first degree level with similar characteristics.
- Overall, the greatest reduction was for women aged 22-30 with a first degree, who were 6.3 percentage points less likely to receive welfare benefits than comparable women who started but did not complete a first degree.

Return on investment

Introduction

The analysis assesses the Return on Investment (ROI) associated with Scottish domiciled individuals who started qualifications at universities in Scotland in the 2018-19 academic year. This involves the estimation of benefits and costs associated with each level of qualification, at the individual and exchequer level.

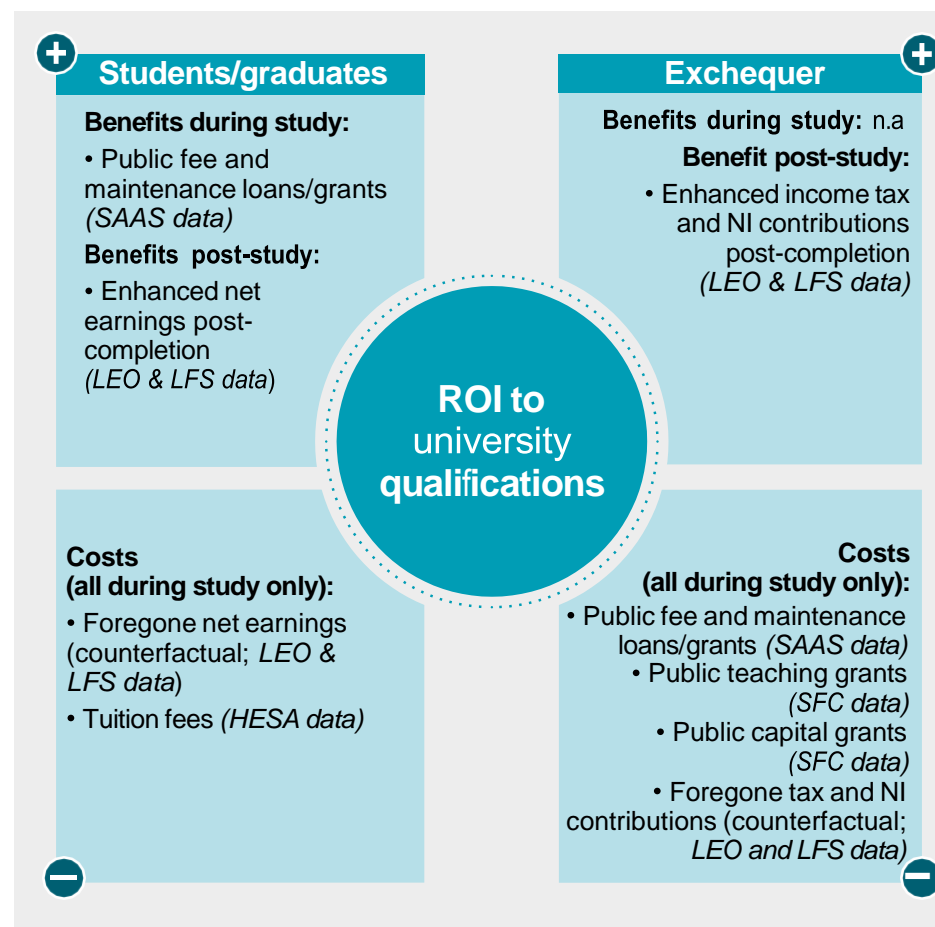
Using the marginal earnings and employment returns presented in section 4, Return on Investment (ROI) to each qualification was estimated for the cohort of students beginning their studies in AY 2018-19. Lifetime earnings were estimated for qualifiers and the control group. For postgraduate taught and research qualifications, the control group was individuals with a first degree. For qualifiers with a first degree the control group was students who began but did not finish a first degree. Lifetime earnings are estimated by combining earning figures from LEO, earning growth rates from the Labour Force Survey (LFS) and marginal earning and employment figures presented in section 6. Comparison of lifetime earnings between learners achieving the qualification and the control group provided an **estimate** of the increase in gross lifetime earnings from completing a qualification. This provided the basis to calculate the net benefit to both the qualifier and exchequer based on the total costs and benefits unique to each. Results are disaggregated by qualification type and sex, reflecting the characteristics of a typical learner within those groups. Calculations apply to Scottish domiciled students living anywhere in the UK after completion of their studies.

Results presented are net present values (NPVs) calculated using discount and inflation rates from the HM Treasury Green Book and Office for Budget Responsibility (OBR) forecasts, respectively.

Changes to economic conditions, such as inflation, may alter the estimated return on investment to qualifications.

The approach to estimating costs and benefits for the ROI model is summarised in Figure 1 below.

Figure 1 - Overview of benefits and costs associated with University Qualifications



Return on investment

Individuals

Table 12 presents return on investment expressed as lifetime net benefit per learner and benefit-to-cost ratios associated with the completion of each qualification. **The ROI estimates are net present values, representing the difference in lifetime earnings (after costs) between individuals who complete a qualification and the control group.** For example, a typical man whose highest qualification is a first degree is estimated to earn £81,780 more than a comparable individual who started but did not complete a qualification at that level. This is equivalent to a benefit to cost ratio of 2.6 to 1 for the individual – in other words a man completing a first degree qualification receives an average additional return of £2.60 for every pound that he spends on gaining the qualification (compared with a non-completer).

Table 12 - Return on investment to the individual by sex

Qualification	Net benefit per learner £ (NPV in 2018-19 prices)		Benefit-to-cost ratio	
	Men	Women	Men	Women
PG (research)*	£68,899	£9,700	2.3	1.2
PG (taught)*	£71,519	£67,866	5.1	4.8
First degree	£81,780	£42,305	2.6	1.9

*Counterfactual is graduates with a first degree.

Key findings:

- Each qualification considered is associated with a positive net present value for the qualifier. Typical graduates from each qualification are estimated to have higher earnings (net costs) than the control group.
- The net present value of each qualification is higher for men than for women. While women have a higher % increase in earnings from qualifying with a first degree or taught postgraduate, men earn more at each level in absolute terms, and this is reflected in the net benefit to learners.
- The methodology assumes that university students forego all earnings during their studies. This is likely to represent an overestimate of the costs to an individual of obtaining a qualification at university and as such returns presented here may be underestimates.

Return on investment

Exchequer

Table 13 presents the ROI to the Scottish Exchequer (the net return to public investment). **The return on investment to the Exchequer represents the difference in exchequer income between qualifiers and the relevant control group, over an individual's lifetime.** For example, men who completed a first degree provide the public purse with a net benefit of £51,081 over their lifetime compared to non-completers with similar characteristics. This is equivalent to a benefit to cost ratio of 2.5 to 1 for the public purse – in other words, a man completing a first degree generates an additional return of £2.50 for every pound of public investment (compared with a non-completer).

Table 13 - Return on investment to the Exchequer

Qualification	Net benefit per learner £ (NPV in 2018-19 prices)		Benefit-to-cost ratio	
	Men	Women	Men	Women
PG (research)*	£87,503	£27,888	8.0	3.3
PG (taught)*	£63,276	£50,628	9.2	7.4
First degree	£51,081	£19,583	2.5	1.6

*Control group is qualifiers with a first degree.

Key findings:

- Qualifying with a first degree is associated with a large, positive increase in income for the Exchequer as compared to individuals who begin but do not complete a first degree.
- Typical qualifiers with either postgraduate research or postgraduate taught qualifications are estimated to produce a large increase in tax income compared to the control group, first degree graduates.
- Men are consistently estimated to generate a larger net return on public investment than for women, reflecting higher lifetime earnings. For postgraduate research students a large amount of this gap is explained by the 'typical learner' used. The average age of a female PGR student is slightly higher than for a male student. As such estimates for women with postgraduate research degrees are generated based on returns to women 31+.

Conclusion and discussion

- The return on investment for all university qualifications are high for both the qualifier and the Scottish exchequer. In general, returns are higher for men than for women. It may be tempting to attribute this to differences in subject choice, however similar research using LEO data in the rest of the UK has identified large differences in expected lifetime earnings between men and women studying the same subject (Britton, Dearden, Van der Erven, & Waltmann, 2020).
- Returns on Investment for postgraduate research qualifications are positive, with the Exchequer benefitting to a greater degree than individuals. The disparity in returns between men and women is especially large at this level, with the estimated return to the Exchequer from men more than 3x as large as for women.
- First degree qualifications are associated with a substantial return on investment, although foregone earnings lead to a reduced benefit to cost ratio. Returns are generally greater for individuals than the Exchequer. It is not possible to comment on the true return on investment to a first degree as differences in academic ability and reasons for continuation/discontinuation are not included in the estimation process.
- Completing a postgraduate taught qualification is associated with a large ROI and benefit to cost ratio (BCR) for both individuals and the Exchequer. Costs of studying postgraduate taught qualifications are generally borne by the individual, with a loan available from SAAS to cover upfront costs. It is not currently possible to comment on how much of these estimated returns reflected differences in academic ability or other characteristics between postgraduate qualifiers and first-degree qualifiers.
- All findings should be considered with mind to the notes made in the consideration section. Results should not be considered as causal, any results presented are in reference to the typical learner present in the data.
- Any potential future research should consider the inclusion of prior-academic attainment in estimating returns to qualifications at university. This data is available for a large portion of the Scottish University population and would allow for a more rigorous analysis of the relationship between higher education qualifications and labour market outcomes. Any future research may be best directed at understanding the drivers behind estimated returns for postgraduate qualifications, including methods that might control for selection into further study.

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Appendix 1: Samples used for Regression Analysis (University Qualifications)

Earnings		Men			Women		
		<=21	22-30	31+	<=21	22-30	31+
Postgraduate (research)	Treatment	3	1,092	652	0	1,007	863
	Counterfactual	18,984	14,964	5,166	27,407	17,877	12,945
Postgraduate (taught)	Treatment	516	8,404	7,019	1,319	13,111	13,746
	Counterfactual	18,984	14,964	5,166	27,407	17,877	12,945
First degree	Treatment	18,984	14,964	5,166	27,407	17,877	12,945
	Counterfactual	4,354	2,373	1,910	4,215	2,840	3,664

Employment		Men			Women		
		<=21	22-30	31+	<=21	22-30	31+
Postgraduate (research)	Treatment	3	1,811	1,198	1	1,621	1,333
	Counterfactual	27,668	22,619	7,973	38,010	25,559	17,666
Postgraduate (taught)	Treatment	862	13,937	11,212	1,879	19,569	18,737
	Counterfactual	27,668	22,619	7,973	38,010	25,559	17,666
First degree	Treatment	27,668	22,619	7,973	38,010	25,559	17,666
	Counterfactual	7,601	4,306	3,669	7,012	5,017	6,492

Welfare Dependency		Men			Women		
		<=21	22-30	31+	<=21	22-30	31+
Postgraduate (research)	Treatment	0	1,803	1,195	0	1,614	1,327
	Counterfactual	27,646	22,534	7,962	38,002	25,375	17,652
Postgraduate (taught)	Treatment	861	13,937	11,185	1,878	19,524	18,712
	Counterfactual	27,646	22,619	7,962	38,002	25,498	17,652
First degree	Treatment	27,646	22,571	7,972	38,002	25,505	17,652
	Counterfactual	7,596	4,299	3,669	7,011	5,005	6,482



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Any enquiries regarding this publication should be sent to us at

The Scottish Government
St Andrew's House
Edinburgh
EH1 3DG

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