

Skills
Development
Scotland



Scottish Funding Council
Comhairle Maoinachaidh na h-Alba

Education and Skills Impact Framework (ESIF)

College 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 on economic outcomes for individuals whose highest qualification was earned at college.**

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 two 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 College Qualifications

The Education and Skills Impact Framework (ESIF) considers 3 pathways: college, university and Modern Apprenticeships. As stated earlier, this report focuses on individuals who earn their highest qualification at college. Key points of context to note regarding qualifications at college are below.

- **Learning descriptor & qualification range:** Colleges provide a wide and varied range of qualifications both on a full time and part time basis. Qualification frameworks judged to be vocational in nature were selected for the analysis including:
 - Advanced Diplomas
 - Diplomas
 - Intermediate courses (SCQF level 4-5)
 - SQA Professional Development Awards (SCQF level 6-10)
 - Scottish Vocational Qualifications (SCQF 4-11)
 - National Certificates (SCQF level 4-6).
 - National Courses (SCQF level 4-5).
 - National Progression Awards (SCQF Level 4-6).
- These qualifications are aggregated by SCQF level. In addition, HNC, HND and other sub-first-degree higher education provision at college and university are grouped into the 'other undergraduate' category.

- **Student numbers:** In academic year 2020-21 there were 54,515 enrolments to other undergraduate courses. There were 144,835 enrolments on relevant courses across SCQF levels 4-8 during this period. Table 1 contains a breakdown of enrolments to college courses in academic year 2020-21.

Table 1 - Enrolments to other undergraduate and college courses, academic year 2020-21

Qualification Group	Enrolments
Other undergraduate	54,515
SCQF Level 8	3,670
SCQF Level 7	12,970
SCQF Level 6	55,455
SCQF Level 5	48,415
SCQF Level 4	24,325
Total	199,345

Purpose and Rationale

- **Public Funding:** Due to the nature of SFC funding for the college sector it is not possible to directly attribute funding to each qualification group. Funding for qualifications has been estimated by taking a proportion of student support, capital, and teaching funding by full time equivalents (Table 2). In 2018-19 the highest funded qualification group was other undergraduate which received an estimated £174m of capital and teaching funding. The level of funding varied across SCQF groups, with less than £1m for SCQF level 8 and £99m for SCQF level 5.

Table 2 - Estimated funding of other undergraduate and SCQF vocational courses, academic year 2018-19

Qualification Group	Estimated Funding
Other undergraduate	£174m
SCQF Level 8	£1m
SCQF Level 7	£9m
SCQF Level 6	£87m
SCQF Level 5	£99m
SCQF Level 4	£30m
Total	£400m

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 largest group of students for most qualification groups is those aged 21 or under at 49.2%, however a substantial group of learners for each qualification group are aged 22-30 or 31+ (20.8%, 30.0%). Table 3 contains Scottish-domiciled enrolments in 2020-21 by qualification and age group.

In academic year 2020-21, 95,015 students were men (47.7%), while 102,950 were women (51.6%). This balance is mainly due to the high proportion of women in the larger other undergraduate group. When excluding this group 49.8% of students were men and 49.5% were women.

As of July 2021, 1.5% of children in Scotland were looked after or on the child protection register (Scottish Government, 2022). These students are likely to leave secondary education earlier, with fewer qualifications and are less likely to achieve a positive destination. In AY 2020-21, 3.6% of full-time higher education (HE) and 9.6% of full-time further education (FE) students at college had care experience. College provides a pathway for these students to access further and higher education at any point in life. Care experience varies within the groups considered, with SCQF groups 4 & 5 having especially high proportions of care experienced enrolments relative to other groups (Table 4).

Context

Of similar note are the Scottish Index of Multiple Deprivation (SIMD) quintiles of students in these groupings. In total 24.3% of students considered are from the 20% most deprived areas. By contrast students from the 20% least deprived areas are underrepresented at 14.7%. Looking at the numbers by level of study it is clear that this pattern is exaggerated at lower SCQF levels, with students from the 20% most deprived areas making up 30% of enrolments to SCQF level 4 courses. These students are over-represented in subsequent qualification group until SCQF 7, with the proportion falling to approximate parity at this point.

Table 3 – Scottish-domiciled enrolments on other undergraduate and SCQF vocational courses by age group, academic year 2020-21

Age group	<=21	22-30	31+	Total
Other undergraduate	25,130	12,985	16,395	54,515
SCQF Level 8	620	920	2,130	3,670
SCQF Level 7	4,670	3,290	5,010	12,970
SCQF Level 6	29,315	11,915	14,225	55,455
SCQF Level 5	24,270	8,850	15,295	48,415
SCQF Level 4	14,105	3,530	6,690	24,325
Total	98,110	41,495	59,740	199,345

Table 4 – Scottish-domiciled enrolments on other undergraduate and SCQF vocational courses by care experience, academic year 2020-21

Care experience (self-reported)	Care-experience	No care-experience	Unknown/ Information Refused	Total
Other undergraduate	1,245	26,290	26,980	54,515
SCQF Level 8	55	365	3,250	3,670
SCQF Level 7	220	1,050	11,700	12,970
SCQF Level 6	1,880	7,335	46,235	55,455
SCQF Level 5	3,185	5,710	39,520	48,415
SCQF Level 4	2,005	3,770	18,550	24,325
Total	8,590	44,520	146,235	199,345

Context

Table 5 - Scottish-domiciled enrolments on other undergraduate and SCQF vocational courses by disability, academic year 2020-21

Disability status	Disability	No Known Disability	Unknown/ In-formation Re-fused	Total
Other undergraduate	9,560	43,425	1,530	54,515
SCQF Level 8	415	2,715	540	3,670
SCQF Level 7	1,415	10,310	1,245	12,970
SCQF Level 6	8,915	43,095	3,445	55,455
SCQF Level 5	9,485	38,245	685	48,415
SCQF Level 4	6,385	16,985	955	24,325
Total	36,175	154,770	8,400	199,345

Table 6 - Scottish-domiciled enrolments on other undergraduate and SCQF vocational courses by sex, academic year 2020-21

Sex	Men	Women	Other	Prefer not to say	Total
Other undergraduate	22,885	31,215	315	100	54,515
SCQF Level 8	1,640	1,995	10	20	3,670
SCQF Level 7	7,230	5,695	20	25	12,970
SCQF Level 6	29,575	25,490	160	230	55,455
SCQF Level 5	21,260	26,840	140	175	48,415
SCQF Level 4	12,420	11,710	75	115	24,325
Total	95,015	102,950	720	665	199,345

Context

Table 7 - Scottish-domiciled enrolments on other undergraduate and SCQF vocational courses by ethnic group, academic year 2020-21

Ethnic group	Asian, Asian Scottish or Asian British	Black, African or Caribbean	Mixed or multiple ethnic group	Not known	Other ethnic group	White	Total
Other undergraduate	1,550	845	595	4,690	425	46,410	54,515
SCQF Level 8	80	65	35	575	20	2,890	3,670
SCQF Level 7	220	120	60	1,365	55	11,145	12,970
SCQF Level 6	1,280	760	405	3,900	390	48,715	55,455
SCQF Level 5	1,130	805	295	1,405	500	44,280	48,415
SCQF Level 4	735	675	165	1,510	485	20,755	24,325
Total	5,000	3,275	1,560	13,445	1,870	174,195	199,345

Table 8 - Scottish-domiciled enrolments on other undergraduate and SCQF vocational courses by ethnic group, academic year 2020-21

SIMD Quintile	1 (most deprived)	2	3	4	5 (least deprived)	Missing/Unknown	Total
Other undergraduate	21.4%	19.8%	19.6%	20.4%	18.4%	0.4%	100%
SCQF Level 8	15.7%	18.9%	19.5%	22.6%	22.8%	0.5%	100%
SCQF Level 7	20.7%	22.2%	21.0%	20.1%	15.6%	0.4%	100%
SCQF Level 6	23.4%	21.5%	20.3%	19.5%	14.7%	0.5%	100%
SCQF Level 5	27.1%	22.3%	20.1%	18.2%	11.9%	0.4%	100%
SCQF Level 4	30.8%	22.9%	18.4%	17.3%	10.3%	0.3%	100%

Context

Social and Wellbeing Impacts

It is widely recognised that education can 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 colleges, from the individual perspective.

College Short-term Outcomes

Outcomes for full-time college leavers are captured through the SFC's College Leavers Destinations Survey (SFC, 2021). The latest set of data reflect outcomes for students studying in academic year 2019-20. Due to the COVID-19 pandemic there was a large degree of disruption both to education and the labour market. This is understood to have affected outcomes for leavers. Of the qualifiers leaving the college sector in AY 2019-20:

- 46.9% went on to further study at university
- 37.5% went on to secure employment 6-12 months after qualifying
- 9.7% were looking for work
- In total 84.4% achieved positive destinations

For students qualifying from courses at SCQF levels 7+, such as HNC and HND:

- 58.8% went on to further study at university
- 31.5% secured employment
- 6.5% were looking for work
- In total 90.3% achieved positive destinations

College Earnings Outcomes

The Scottish Government's Longitudinal Education Outcomes (LEO) from Colleges experimental statistics release (2019) provides median earnings following completion of a full-time course at college. Data is disaggregated into FE students and to HNC and HND students. Disaggregated data to match the full other undergraduate group is not available. The latest published data describes outcomes for students completing their studies in AY 2012-13. These individuals are observed early in their post qualification careers and may not yet be receiving the full benefit of their qualification. Three years after completing their qualification:

- FE students in sustained employment had median earnings of £13,800
- Students who completed a HNC or HND had median earnings of £15,600

For both FE and HE students a clear gap was present in median earnings by sex:

- Men who studied Full-time further education qualifications had median earnings £2,600 more than women with the same qualification, three years after completion
- Men with a HNC or HND qualification had median earnings £2,200 more than women with the same qualification, three years after completion

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 modern apprenticeship (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 (e.g. first degrees) 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** - Provision at college is grouped by SCQF level, ensuring that an approximately equal level of skills and experience is assumed. However, this ignores differences in teaching framework and intended learning outcomes between courses at the same level. Results should be considered as reflecting an average result across provision at an SCQF level and do not provide insight into the outcomes for learners with qualifications from any singular framework.

Benefit to Individuals

Introduction

The following section covers the difference in earnings, employment and benefit dependency related to completing a qualification at college. 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.

Individuals with qualifications in SCQF level groups 4 – 8 are compared to students who began but did not complete a qualification at the appropriate level. Individuals with qualifications in the other undergraduate group were compared to qualifiers at SCQF level 6 due to sample size restrictions. It is not clear how comparison to learners achieving SCQF level 6 qualifications affects results, or whether this group is an appropriate control group.

Benefit to Individuals

Earnings

Table 9 presents the estimated earnings returns for each qualification, three years after completion (broken down by gender 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 an 'other undergraduate' qualification aged 21 or less earn 6.6% more than women with similar characteristics who completed a qualification at SCQF level 6. Treatment and control group sample sizes are presented in the Appendix.

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

Qualification Group	Women			Men		
	<=21	22-30	31+	<=21	22-30	31+
Other undergraduate	6.6%	12.2%	14.1%	Not sig.	Not sig.	Not sig.
SCQF Level 8	Unavailable	Not sig.	4.6%	Unavailable	Unavailable	-4.8%
SCQF Level 7	Unavailable	15.9%	Not sig.	Not sig.	12.4%	12.6%
SCQF Level 6	Not sig.	Not sig.	9.7%	13.3%	8.2%	5.5%
SCQF Level 5	3.8%	7.6%	4.8%	2.5%	18.6%	11.9%
SCQF Level 4	Not sig.	9.6%	13.4%	6.3%	22.7%	21.5%

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

Key findings:

- Results are frequently unavailable due to sample size restrictions, or non-significant
- Where defined returns are positive, except for men aged 31+ with SCQF level 8 qualifications
- Women tend to receive greater returns at higher SCQF levels, with men receiving greater returns at lower SCQF levels
- The largest returns were for men aged 22-30 with an SCQF level 5 qualification

Benefit to Individuals

Employment

Table 10 presents the estimated employment returns for each qualification, three years after completion (broken down by gender 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 women aged 21 or less with an SCQF level 5 qualification are estimated to spend 9.8pp more of the year in employment than women with similar characteristics who started but did not complete an SCQF level 5 qualification.

Table 10 - Marginal employment returns to qualifications by age and sex, 3 years post-qualification

Qualification Group	Women			Men		
	<=21	22-30	31+	<=21	22-30	31+
Other undergraduate	6.0	2.7	-1.0	2.2	Not sig.	-1.3
SCQF Level 8	Not sig.	7.3	Not sig.	Not sig.	Not sig.	3.4
SCQF Level 7	Not sig.	6.2	3.4	Not sig.	-5.2	6.5
SCQF Level 6	5.2	5.1	3.7	4.1	5.4	2.0
SCQF Level 5	9.8	12.2	4.4	8.9	9.6	9.4
SCQF Level 4	11.6	7.9	4.3	10.8	10.4	9.5

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

Key findings:

- Returns for SCQF levels 4 to 6 are positive, completing a qualification at these levels is associated with an increase in the proportion of the year spent in employment compared to non-completers.
- Results for SCQF level 7, 8 and other undergraduate courses are mixed. While many results are significant and positive, a number are non-significant. In addition, the employment return to other undergraduate courses is negative for both sexes at age range 31+, implying that individuals achieving this qualification level are likely to spend 1 to 1.3 percentage points less of the year in employment than individuals who completed SCQF level 6 qualifications.
- Comparing employment returns for men and women aged 30 and under, completing a qualification is generally associated with spending a greater portion of the year in employment for women than for men. This pattern appears to be reversed for individuals aged 31+.

Benefit to Individuals

Welfare benefit dependency

Table 11 presents the estimated benefit dependency returns for each qualification, three years after completion (broken down by gender and age at completion), with respect to the control group. **Welfare dependency returns are interpreted as the percentage point difference in the likelihood receiving welfare benefits for an individual with a given qualification relative to a control group.** For example, the results suggest that women aged 21 or less with an SCQF level 5 qualification are 10.5 percentage points less likely to receive welfare benefits than women with similar characteristics who started but did not complete a qualification at the same level. In this case, a negative figure indicates a more favourable result.

Table 11 - Marginal benefit dependency returns to qualifications by age and sex, 3 years post-qualification

Qualification Group	Women			Men		
	<=21	22-30	31+	<=21	22-30	31+
Other undergraduate	-6.6	-2.9	Not sig.	-7.1	-4.2	Not sig.
SCQF Level 8	Unavailable	-9.1	-2.4	Not sig.	Not sig.	-2.8
SCQF Level 7	-9.3	Not sig.	-2.1	-6.9	Not sig.	-3.0
SCQF Level 6	-7.2	-6.5	-3.0	-6.2	-8.1	-3.8
SCQF Level 5	-10.5	-10.5	-4.6	-8.9	-8.6	-6.0
SCQF Level 4	-9.5	-8.6	-4.6	-7.3	-15.7	-6.6

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

Key findings:

- The majority of qualifications considered are associated with a reduction in the probability of receiving welfare benefits, compared to the control group.
- Unlike for earnings there is no clear pattern in benefit dependency by sex at higher SCQF levels. Completion of a qualification at SCQF levels 4 & 5 appears to be associated with a greater reduction in the probability of receiving benefits for women than for men.
- Overall, the largest reduction in likelihood to receive welfare benefits is seen for men who complete an SCQF level 4 qualification as compared to men who started but did not finish a qualification at that level.

Return on Investment

Introduction

The analysis assesses the Return on Investment (ROI) associated with Scottish domiciled individuals who started qualifications at College 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.

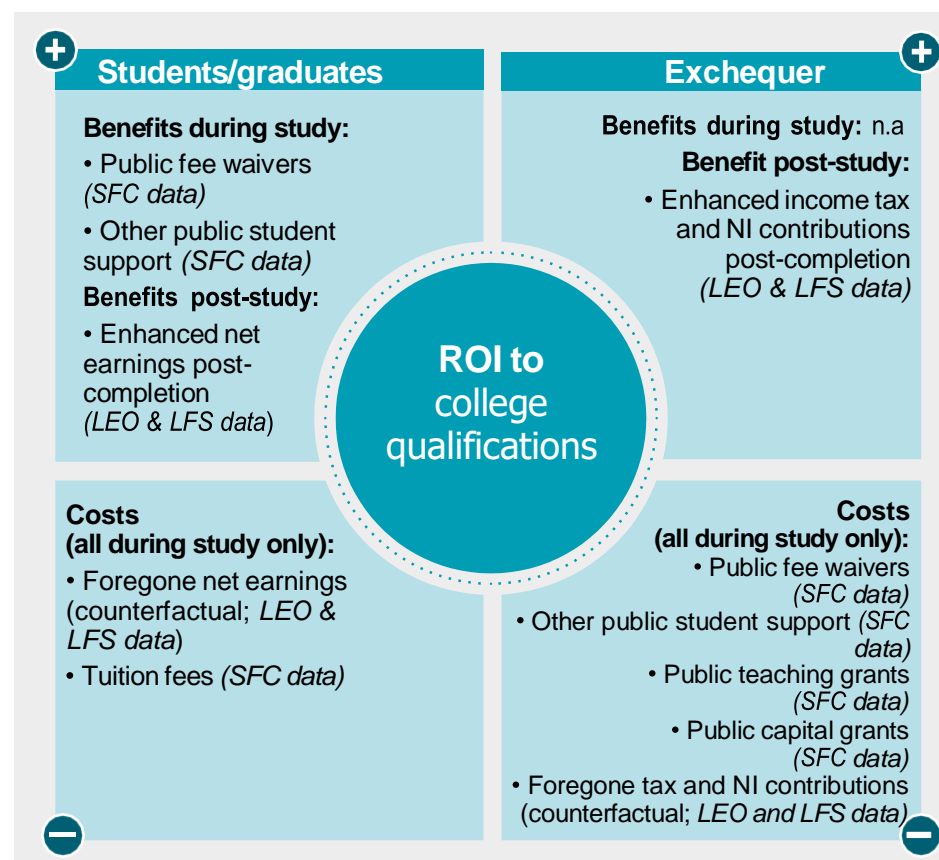
Using the marginal earnings and employment returns presented in section 4, Return on Investment (ROI) was estimated for the qualifications sat by students beginning their studies in AY 2018-19. Lifetime earnings were estimated for students who achieved their qualification and the control group. For the other undergraduate group, the control group was learners with a highest qualification at SCQF level 6. For each other group considered in this report the control group was learners who started but did not complete the qualification in question.

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 4. 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 individual 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. For some groups lifetime earnings were estimated based on one or more non-significant result as this provided the best available point estimate. Such groups are highlighted in grey. 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.

Figure 1 - Overview of benefits and costs associated with College qualifications.



Return on Investment

Individuals

Table 13 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 woman whose highest qualification is at SCQF level 5 is estimated to earn £61,605 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 9.3 to 1 for the individual – in other words a woman completing an SCQF level 5 qualification receives an average additional return of £9.30 for every pound that she spends on gaining the qualification (compared with a non-completer).

Table 13 - 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
Other undergraduate	-£1,442	£68,517	0.9	7.2
Vocational SCQF 7	£48,324	£63,358	2.8	3.7
Vocational SCQF 6	£11,981	£9,492	2.0	2.0
Vocational SCQF 5	£85,141	£61,605	10.0	9.3
Vocational SCQF 4	£58,683	£23,771	8.7	4.9

*Shaded cells indicate estimates are calculated based on one or more non-significant marginal earning/employment result.

Key findings:

- The majority of qualifications are associated with a net increase in lifetime earnings for the individual, compared to control groups.
- A distinct pattern is observed by sex. The net present value of qualifications at SCQF level 4 & 5 are higher for men than for women. This gap closes at SCQF level 6 and for other undergraduate and SCQF level 7 qualifications the NPV is greater for women than for men.
- Comparing employment returns for men and women aged 30 and under, completing a qualification is associated with spending a greater additional portion of the year in employment than for men. This pattern appears to be reversed for individuals aged 31+.

Return on Investment

Exchequer

Table 14 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 qualification at SCQF level 5 provide the public purse with a net benefit of £45,654 over their lifetime compared to non-completers with similar characteristics. This is equivalent to a benefit to cost ratio of 6.7 to 1 for the public purse – in other words, a man completing a SCQF level 5 qualification generates an additional return of £6.70 for every pound of public investment (compared with a non-completer).

Table 14 - Return on investment to the Exchequer

Qualification	Net benefit per learner £ (NPV in 2018-19 prices)		Benefit-to-cost ratio	
	Men	Women	Men	Women
Other undergraduate*	-£3,333	£39,393	0.7	5.6
Vocational SCQF 7	£33,359	£44,114	3.2	4.3
Vocational SCQF 6	£4,495	-£298	1.5	1.0
Vocational SCQF 5	£45,654	£3,088	6.7	1.4
Vocational SCQF 4	£20,942	-£8,474	3.5	0.0

*Shaded cells indicate estimates are calculated based on one or more non-significant marginal earning/employment result.

Key findings:

- The majority of qualifications are associated with a net increase in income to the Exchequer and as such a positive benefit to cost ratio.
- As with returns to the individual, the return to the exchequer from men sitting SCQF level 4 to 6 qualifications is greater than for women. This trend is reversed at SCQF level 7 and for other undergraduate courses.
- Men completing other undergraduate qualifications are associated with a loss in income to the Exchequer as compared to men with SCQF qualifications at level 6. This control group was chosen due to a limited sample size of non-completers at the other undergraduate level. It is unclear how this comparison affects results. As more years of data are added to LEO it may be possible to move to a non-completer control group in line with other qualification groups.

Conclusion and Discussion

- There is a distinct pattern by sex, with returns to qualifications for women higher at SCQF levels 7+. Men generally have higher returns at lower SCQF levels. In general women are more likely to progress to higher levels of education, as such women observed at lower SCQF levels may have lower academic ability than the comparable men at that level. Alternatively, this pattern may be driven by differences in subject of study by sex, as the methodology does not control for this.
- Unlike other qualifications presented, returns to other undergraduate qualifications use a lower qualification level (SCQF level 6) as a control group. It is unclear how this may affect the marginal returns and therefore the overall ROI of these qualifications. A high proportion of college leavers with qualifications at SCQF level 7+ progress to study at university (58.8%). One possibility is that a selection effect is present, where students with lower earnings potential do not progress to higher levels of study and therefore are captured in the marginal returns.
- It is also worth noting the large disparity in studying other undergraduate qualifications for men and women. While returns to the Exchequer and individual are slightly negative for men on these qualifications, there are large and positive returns to both from women studying at this level. The magnitude of this disparity is by far greater than for any other qualification.
- Lower SCQF level qualifications, particularly SCQF level 5, provide high returns to individual. This is of particular interest as these qualifications are sat by a higher number of individuals from SIMD 0-20 and/or care leaver backgrounds.
- 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.
- Future research might focus on establishing a deeper understanding of which qualifications are intended to support a student entering the labour market and are therefore appropriate to analyse in this context. This might include an examination of the stated aims of qualifications considered alongside a mapping exercise to establish which qualifications function as de facto entry points to the labour market. This would strengthen the focus of the analysis and ensure that labour market outcomes are driven by qualifications rather than reflecting the characteristics of the students taking those qualifications.

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

Earnings		Men			Women		
		<=21	22-30	31+	<=21	22-30	31+
Other undergraduate, including HNC and HND	Treatment	18,984	14,964	5,166	27,407	17,877	12,945
	Counterfactual	2,808	1,247	3,633	2,188	1,500	5,414
SCQF Full Vocational Level 7	Treatment	1,348	377	1,273	268	361	5,414
	Counterfactual	243	175	791	82	175	2,534
SCQF Full Vocational Level 6	Treatment	2,808	1,247	3,633	2,188	1,500	5,414
	Counterfactual	1,348	467	1,361	1,040	656	2,534
SCQF Full Vocational Level 5	Treatment	6,334	1,935	5,429	4,445	2,069	7,675
	Counterfactual	3,056	784	1,958	2,395	866	3,256
SCQF Full Vocational Level 4	Treatment	3,317	1,014	3,418	2,037	950	4,703
	Counterfactual	1,200	295	705	761	309	1,260

Employment		Men			Women		
		<=21	22-30	31+	<=21	22-30	31+
Other undergraduate, including HNC and HND	Treatment	19,103	8,364	9,542	19,503	10,844	20,894
	Counterfactual	5,304	2,011	5,359	3,449	2,432	7,765
SCQF Full Vocational Level 7	Treatment	2,474	774	1,802	392	513	2,404
	Counterfactual	483	309	1,269	130	255	1,081
SCQF Full Vocational Level 6	Treatment	5,304	2,011	5,359	3,449	2,432	7,765
	Counterfactual	2,935	850	2,152	1,790	1,194	3,844
SCQF Full Vocational Level 5	Treatment	10,652	3,466	8,628	7,679	3,718	11,732
	Counterfactual	6,369	1,758	3,689	5,208	1,996	5,363
SCQF Full Vocational Level 4	Treatment	5,980	1,833	5,793	3,929	1,683	7,287
	Counterfactual	2,905	724	1,550	1,904	677	2,191

Welfare Dependency		Men			Women		
		<=21	22-30	31+	<=21	22-30	31+
Other undergraduate, including HNC and HND	Treatment	19,053	8,290	9,496	19,461	10,787	20,876
	Counterfactual	5,297	1,991	5,305	3,441	2,406	7,763
SCQF Full Vocational Level 7	Treatment	2,450	582	1,664	259	419	2,276
	Counterfactual	479	236	1,158	101	216	1,016
SCQF Full Vocational Level 6	Treatment	5,285	1,936	5,224	3,419	2,353	7,741
	Counterfactual	2,929	819	2,114	1,773	1,176	3,838
SCQF Full Vocational Level 5	Treatment	10,652	3,418	8,602	7,671	3,666	11,683
	Counterfactual	6,369	1,741	3,681	5,199	1,966	5,343
SCQF Full Vocational Level 4	Treatment	5,978	1,786	5,721	3,919	1,633	7,207
	Counterfactual	2,904	717	1,533	1,896	656	2,176



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